
U.S. Nuclear Regulatory Commission
RCM-96
Response Coordination Manual 1996
Incident Response Division
Office for Analysis and Evaluation of Operational Data

NUREG/BR–0230

U.S. Nuclear Regulatory Commission

RCM-96

Response Coordination Manual

E. Weinstein
R. Hogan

Incident Response Division
Office for Analysis and Evaluation
of Operation Data

Table of Contents
With Section Summary

List of Tables

List of Figures

List of Charts

ACKNOWLEDGMENTS

This document is a compilation of various documents, many of which have been published previously. The nature of that process means that many individuals from many organizations have contributed to its content. While we cannot thank each one by name, as the authors of the Response Coordination Manual, we wish to thank those individuals from the NRC staff, NRC licensees, States and other Federal agencies for their contributions to this document. In particular we wish to acknowledge the contributions of Joan Aron, Gene Bates, Robert Bores, Prosanta Chowdhury, Harvey Clark, Frank Congel, Melanie Galloway, Joe Himes, Felicia Hinson, Jim Hufham, Karen Jackson, Paul Kaufman, Tom McKenna, Aby Mohseni, Steve Orth, Tom Ploski, Janet Quissell, Rich Struckmeyer, Jean Trefethen and Doug Weaver. We also wish to acknowledge the editorial assistance of Katherine VonWald, SAIC without whom this document could not have been compiled.

Eric Weinstein
Rosemary Hogan

INTRODUCTION

The Response Coordination Manual(RCM) provides the user with a guide for accomplishing the coordination activities to which the NRC is committed during a response to an emergency at an NRC licensed facility. It may be used as a training tool and should be consistent with and supplement other more detailed procedures that may exist within other organizations. This compilation of material is the result of extensive training and experience within the response community.

There may be many organizations involved in a response to an emergency: utilities, local response organizations, States, Federal agencies, and the international community. Close coordination among the organizations is essential to the success of a response. Knowledge of each organization's responsibilities and how they implement these responsibilities will enhance the effectiveness of the response. This manual provides detailed information on the types of response activities that involve multiple organizations.

The RCM is a compilation of NRC documents that discuss various aspects of a response to an event at an NRC licensed facility. The documents in the RCM focus primarily on non-technical coordination rather than technical analysis. Several documents which were previously published as NUREGs have been updated and are included here. Those NUREGs, when and if requested, will now be cross-referenced to the RCM and are listed below:

Emergency Response Resources Guide,
(formerly NUREG-1442, rev.2, now Section A)
Response Protocols for Federal Agencies, (formerly NUREG-1467, now Section D)
Resources Available for Nuclear Power Plant Emergencies Under the Price-Anderson Act and the Robert T. Stafford Disaster Relief and Emergency Assistance Act,
(formerly NUREG-1457, now Section P)
Concept of Operations with Organizations Charts - NRC Incident Response,
(formerly NUREG-1471, now Section Q)

The RCM also updates other material formerly located in the Response Technical Manual and published within the NRC as working emergency response documents. Examples include Section H, Federal Radiological Monitoring Assitance and Section J, Federal Aerial Monitoring Capability.

The RCM also contains materials of interest that are reproduced verbatim such as the IAEA Conventions and the Federal Radiological Emergency Response Plan (FRERP).

Finally, information not previously published but of interest to potential responders is included as well. Examples include Section F, Telecommunications During a Radiological Accident; Section T, Guidance for Response to Transportation Accidents; and Section R,the NRC Public Affairs Plan.

All documents were coordinated with all cognizant organizations prior to publication of this manual. However, emergency response guidance and procedures are often modified to reflect experiences and lessons-learned. This manual will be updated periodically to reflect those modifications, but on occasion some information may be out of date. Every attempt will be made to minimize this situation.

The RCM is a companion to the Response Technical Manual (RTM). The RTM describes methods for assessing core damage and performing dose projections; the RCM describes the types of interactions that may occur between the NRC and the other response organizations to provide an effective coordinated response to a radiological emergency.

Use of the Manual:

The manual is organized by the types of activities the NRC coordinates during an emergency. Each section contains descriptions of the key coordination activities anticipated to occur with that agency in a response. The protocols for these coordination activities are provided in the sections titled "State Requests for Federal Assistance," Federal Response Activation," Coordination of Protective Action Recommendations," "Coordination Within the NRC," and "Coordination with the International Community." The "Guidance" section provides the basis, background, and additional information that is useful in performing the response coordination activity. Also included are generic lists of abbreviations and acronyms (individual sections may have their own such lists) and a detailed index.

The thumb index on the back cover of the document is useful in locating a specific section in the manual.

Response Coordination Manual Flow Chart:

The flowchart on the following page illustrates the order in which the sections could be used during an emergency at a nuclear power plant. However, this is only a suggested guide and not meant to be restrictive in any way.

RESPONSE COORDINATION MANUAL FLOW CHART
- Reactor Accidents -

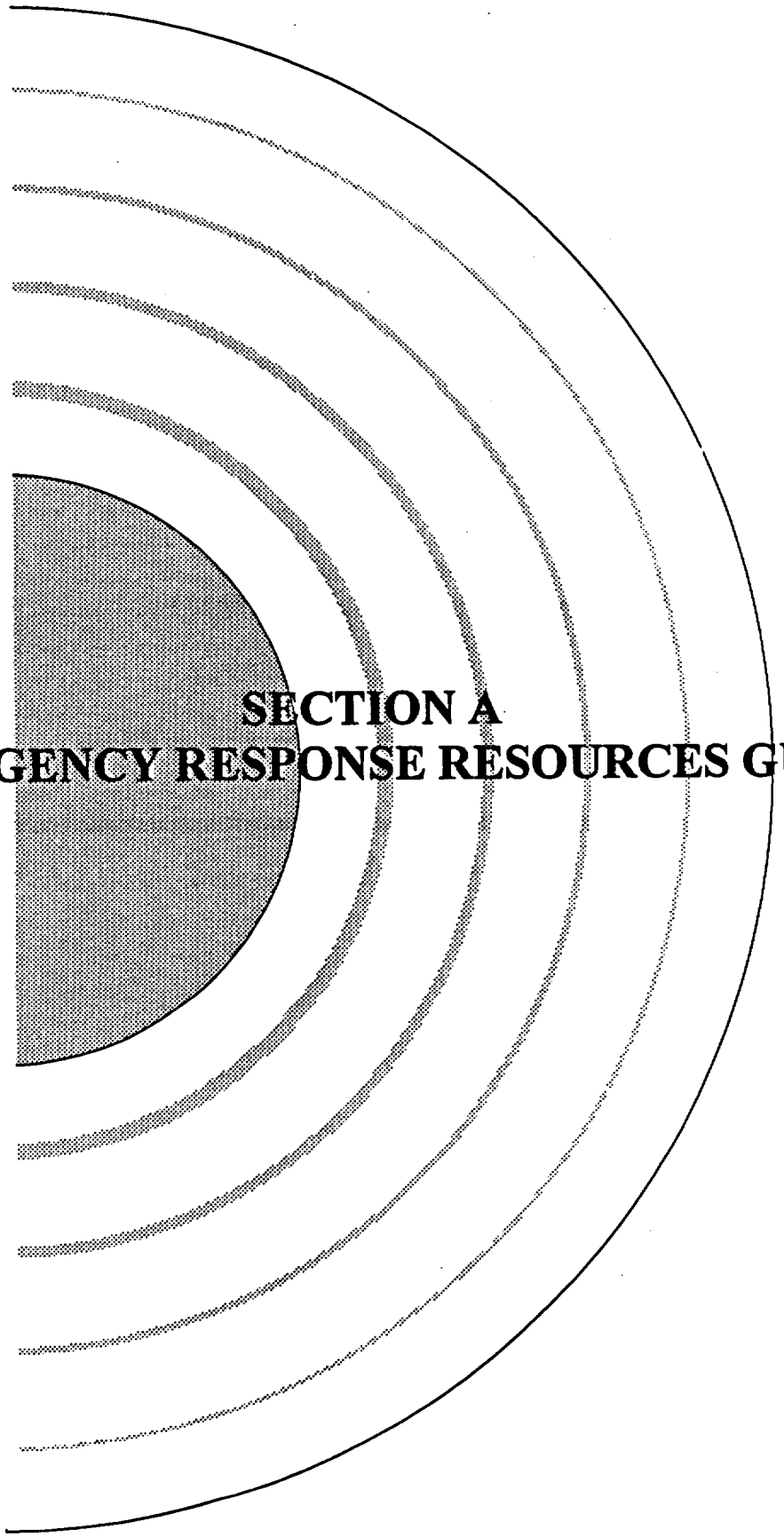
"What Section would I use ..."

BEFORE PLUME RELEASE	DURING THE PLUME PHASE	AFTER PLUME PASSAGE
Select LFA, Sections C and V	State Requests Federal Resources and Assistance, Sections A and B	Resources requested through Price-Anderson Act and/or Stafford Act, Section P
⇩	⇩	
NRC activates response organizations, Section Q	Federal agencies provide radiological assistance, Sections H, I, J, K, and L	
⇩	⇩	
Federal agencies respond, Sections D, E, and V	Federal agencies coordinate protective action advice, Section G	
⇩	⇩	
NRC completes IAEA notifications and notifications to other countries, Sections N and O	NRC controls radiation exposure for response personnel, Section M	
⇩	⇩	
Federal agencies provide communications support, Section F	NRC keeps press and public informed during an emergency, Sections R and S	

- Non-Reactor Accidents -

NRC Identifies Chemical Hazards, Section U

NRC Responds to Transportation Accidents, Section T



SECTION A
EMERGENCY RESPONSE RESOURCES GUIDE

SECTION A
EMERGENCY RESPONSE RESOURCES GUIDE
(NUREG-1442, REV. 2)

ABSTRACT

On August 28 and September 18, 1990, the States of Louisiana and Mississippi, Gulf States Utilities, five local parishes, six Federal agencies, and the American Nuclear Insurers participated in a post-emergency TABLETOP exercise in Baton Rouge, Louisiana. One of the products developed from that experience was this guide for understanding the responsibilities and obtaining resources for specific needs from the various participants, particularly from organizations within the Federal Government. This second revision of that guide broadens the focus of the original document. Also, finalization of the Federal Radiological Emergency Response Plan provides new information on the major Federal responsibilities. This guide should assist State and local government organizations with identifying and obtaining those resources for the post-emergency response when their resources have been exhausted.

STATEMENT OF PURPOSE

This section serves as a quick reference to the resources available to principal participants in an emergency response to a major emergency at a commercial nuclear power plant. The information included here evolved from the post-emergency TABLETOP exercise held in Baton Rouge, LA, on August 28 and September 18, 1990. The functional areas represented in the response resources chart were identified during the TABLETOP exercise as having generic application for emergency response to a nuclear power plant accident. The chart reflects the general functional areas that would need to be considered in responding to this type of event.

It is anticipated that it would take at least 24 hours for the full complement of Federal resources to be brought to bear on a response of this magnitude once State and local organizations requested assistance. Early requests for resources would normally come through the headquarters or regional offices of the Federal organizations. The Federal Radiological Emergency Response Plan designates a Lead Federal Agency (LFA) to coordinate the disposition of those Federal resources. For a radiological emergency at a commercial nuclear power plant, the U.S. Nuclear Regulatory Commission (NRC) would be the LFA. Most State requests for assistance of a technical nature would be obtained through the LFA located at the utility's emergency operations facility or headquarter (HQ) Operations Center. Radiological monitoring information and support would normally be provided through the Federal Radiological Monitoring and Assessment Center. State requests for resources of a non-radiological nature would be addressed in the Disaster Field Office, the locations of which could be predetermined or will be determined at the time of the full-scale Federal response.

This section is designed to help States and local organizations determine which responding agency has the expertise in the areas where support is needed. It can also help the States to decide on how to utilize their own resources most effectively. This section is not meant to address all possible resources available from the Federal Government, but only those most likely to be applied in response to a nuclear power plant accident. This section is not meant to replace any other planning document or other arrangements that exist between responding groups. It should, however, acquaint State and local organizations with the broad range of expertise available in the Federal community.

Also included is a list of phone numbers for agencies that would normally respond to this type of event so that State and local organizations can contact those organizations needed for support directly, in the event the States seek help before a Federal presence is established on or near the site. In addition, there is a description of the major facilities involved and what actions are anticipated to occur in them.

Each responding agency has specific resources and responsibilities, most of which are addressed in this section. These can be more fully understood through examination of the Federal Radiological Emergency Response Plan and the Federal Response Plan.

A few words about the style of this guide. The normal rule for the use of abbreviated forms will not be observed here. It is our experience that State and local organizations, for whom this guide has been developed, are not as familiar with the abbreviated forms as is the Federal community. It is our decision, then, to re-state abbreviated forms following the first use of the term or organization name on each page of the manual.

Included in the text for each responding Federal agency are guidelines for how those resources can be obtained; these guidelines are given in a section entitled "How To Access." This is not included for the text on State, local, and utility response as that may vary considerably depending on locality. This information is specifically found in State, local, and utility emergency plans.

HOW TO OBTAIN FEDERAL HELP

A declaration of a Major Disaster or Emergency under the Robert T. Stafford Disaster Relief and Emergency Assistance Act, P.L. 93-288 as amended by P.L. 100-107, is not required for obtaining Federal assistance in the event of a radiological emergency. If the organizations listed below cannot be reached directly, call the U.S. Nuclear Regulatory Commission (NRC) Operations Center.

Before All Response Facilities Are Operational

Accident Assessment

To get: Protective action assessment based on plant conditions, classification assessment, Atmospheric Release Advisory Capability projections, National Oceanic and Atmospheric Administration weather analysis, consequence projections, assistance from the U.S. Environmental Protection Agency (EPA), the U.S. Department of Health and Human Services (HHS), and the U.S. Department of Agriculture (USDA) on application of their guidance and Protective Action Guides

Call: NRC Operations Center

Ask for: Response Coordination Team (RCT)

Radiological Monitoring

To get: Radiological Assistance Program (RAP) team (a few hours), airborne monitoring or integrated monitoring and assessment at a Federal Radiological Monitoring and Assessment Center (FRMAC)

Call: U.S. Department of Energy (DOE) Regional Coordinating Office

Ask for: RAP

Nonradiological Assistance

To get: Assistance from any Federal agency that is not associated with radiological monitoring U.S. Department of Energy (DOE) or assessment of accident progression or radiological consequences U.S. Nuclear Regulatory Commission (NRC)

Call: Federal Emergency Management Agency or the NRC

After Response Facilities Are Operational

Accident Assessment

Call: Emergency Operations Facility (EOF), Federal Radiological Monitoring and Assessment Center (FRMAC), or Disaster Field Office (DFO)

Radiological Monitoring

Call: EOF or FRMAC

Nonradiological Assistance

Call: DFO

Phone Numbers for Emergency Response

American Nuclear Insurers (ANI)/Mutual Atomic Energy Liability Underwriters (MAELU)	Contact utility
U.S. Department of Agriculture (USDA)	(202) 254-2500*
U.S. Department of Energy (DOE)	(202) 586-8100
U.S. Department of Health and Human Services (HHS)	(770) 488-7100
U.S. Environmental Protection Agency (EPA)	(800) 424-8802*
Federal Emergency Management Agency (FEMA)	(202) 898-6100
U.S. Nuclear Regulatory Commission (NRC)	(301) 816-5100** (301) 951-0550

*No 24-hour number.
**This number can be used to obtain assistance from any of the other organizations if they cannot be reached directly.

MAJOR FEDERAL RESPONSE FACILITIES

NRC Headquarters Operations Center

The U.S. Nuclear Regulatory Commission (NRC) activates the Operations Center early in an incident. The NRC Executive Team Director (usually the Chairman) is in charge of the NRC response at the Operations Center until such time as his authorities are transferred to the Director of Site Operations (DSO) at the site. The Operations Center staff helps the State assess possible protective actions based on plant conditions. It acts as a single point of contact for State assistance to obtain help from other Federal agencies, such as monitoring and assessment capability from the U.S. Department of Energy (DOE), and assistance in interpreting and applying guidance from the Advisory Team on the Environment, Food and Health (Advisory Team) composed of representatives from the U.S. Environmental Protection Agency (EPA), the U.S. Department of Health and Human Services (HHS), and the U.S. Department of Agriculture (USDA). It offers licensees access to specialized expertise and the resources of the national laboratories. It coordinates NRC support for its site team after the NRC lead shifts to the site and continues to coordinate Federal activities at the headquarters level. The Operations Center staff, fully activated, numbers about 75.

Emergency Operations Facility (EOF)

The utility establishes the EOF very early in a response to an accident at a power plant. The NRC DSO will be in charge of the Federal Government response from this location and provides Federal assistance once the authorities of the NRC are transferred from the Operations Center (about 2 to 8 hours) to the site. Once the NRC response activities are directed from the EOF, assessments of protective actions based on plant conditions; application of Advisory Team (EPA, HHS, or USDA) guidance; or coordination with DOE field monitoring activities may be obtained there. The NRC will be monitoring licensee activities relating to the accident. Early in the event, Federal representation in the EOF will be about 20 individuals.

Joint Information Center (JIC)

The utility establishes a JIC very early in an accident. The DSO will be the spokesperson for the Federal Government response from this location; however, an NRC Public Affairs Coordinator will represent the NRC and coordinate Federal public information at the JIC. The JIC will be the initial location for coordination of public information. Later, other locations may be established. All participating Federal agencies, the utility, and State and local organizations should be represented in the JIC.

State Emergency Operations Center (EOC)

The State establishes the EOC very early in a response to an accident at a power plant (normally at the Alert emergency class). The NRC Director of Site Operations will be responsible for the Federal Government response; however, a member of the NRC senior staff

and State liaison will represent the U.S. Nuclear Regulatory Commission (NRC) at the Emergency Operations Center (EOC). The NRC will offer assistance to the State at the EOC and will provide information on the NRC and Federal Government response to the event as necessary. The Federal Emergency Management Agency (FEMA) would also normally have representation at the EOC. Early in the event, Federal representation in the EOC will be about 2 to 4 individuals.

Federal Radiological Monitoring and Assessment Center (FRMAC)

The U.S. Department of Energy (DOE) establishes the FRMAC following a request from the Lead Federal Agency (LFA) or State. This normally occurs within 24 to 48 hours of the time this resource is requested. After a decision to activate the FRMAC is made, the State will be contacted by a FRMAC advance team to assist in determining an appropriate location and initial plans. The DOE FRMAC Director will be in charge of radiological monitoring activities in support of the State from this location. Representatives from the U.S. Department of Agriculture (USDA), the U.S. Environmental Protection Agency (EPA), the U.S. Department of Health and Human Services (HHS) (Advisory Team on the Environment, Food, and Health), and NRC will provide assistance to the State in interpreting their agency's guidance from this location. Federal representation in the FRMAC will be about 200 to 300 individuals. State technical assessment, sampling, and analysis teams are encouraged to conduct their activities in coordination with the Federal Government at the FRMAC.

Disaster Field Office (DFO)

FEMA establishes the DFO upon a request from the LFA to coordinate non-radiological assistance. This normally occurs within 12 to 48 hours of the time a decision is made to augment the Federal presence on scene. Normally, the NRC requests this resource. FEMA will contact the State (once a decision to activate the DFO is made) to assist in determining an appropriate location. The Senior FEMA Official, prior to a Stafford Act declaration of Emergency, or a Federal Coordinating Official, following that declaration, will coordinate the Federal Government activities in support of the State from this location. The DFO will provide Federal assistance on non-radiological resources to the State. Representatives from the Federal agencies acting under the Federal Response Plan Emergency Support Function structure will provide assistance and guidance from this location. Federal representation in the DFO will be from 100 to 300 individuals.

THIS PAGE INTENTIONALLY LEFT BLANK

RESPONSE RESOURCES CHART

LEGEND:

● Provided directly ▲ Provided through LFA[1] ■ Obtained through FRMAC
□ Obtained through DFO ○ Obtained through JIC

Resource Available	State	Local	Utility	NRC	FEMA	DOE	EPA	USDA	HHS	ANI
Access Control	●	●	●							
Agricultural Protective Measures	●	●						● ■		
Communications	●	●	●		●□	●■				
Crisis Counseling	●	●							●□	
Damage Assessment	●	●	●	●	●■□			●■		
Decontamination	●	●	●				●			
Dispersion Predictions	●		●	●		●				
Disposal of Contaminated Materials	●	●	●			●■	■	●■		
Dose Reduction	●		●	●		▲	▲	●▲		
Environmental Cleanup	●		●			■	■			
Evacuation Implementation	●	●			▲□					
Evacuation Recommendation	●	●	●	●	▲					
Exposure Control	●		●	●		■	■			
Financial Assistance	●	●	●	●[2]	●□					●
Food Embargoes and Assistance	●	●			□			●□	▲□	
Food Safety	●	●						●□	●□	
Law Enforcement	●	●								

[1]LFA = Lead Federal Agency; FRMAC = Federal Radiological Monitoring and Assessment Center; DFO = Disaster Field Office; JIC = Joint Information Center.

[2]Administers Price-Anderson Act

LEGEND:
● Provided directly ▲ Provided through LFA[3] ■ Obtained through FRMAC
□ Obtained through DFO ○ Obtained through JIC

Resource Available	State	Local	Utility	NRC	FEMA	DOE	EPA	USDA	HHS	ANI
Long-Term Health Registries Plan	●								●□	
Long-Term Radiation Monitoring	●	●	●	▲	▲	▲	▲	▲	▲	
Medical Assistance	●	●			●□	●□[4]			●□	
Protective Action Guidance				●			▲	▲	▲	
Protective Action Implementation	●	●								
Protective Action Recommendations	●	●	●	●	▲		▲	▲	▲	
Public Information	●	●	●○	●○	●○	▲○	▲○	▲○	▲○	●○
Radiation Monitoring	●■[5]		●	■		■	■	■	■[6]	
Recovery Plan	●	●	●	●	▲	▲	▲	▲	▲	
Reentry	●	●	●	●	□	■	■	■	■	
Relocation Assistance	●	●	●	▲□	▲□	▲□	▲□	▲□	▲□	
Response Management	●	●	●	●	▲□					
Return	●	●	●	●		■	■	■	■	
Sampling/Analysis	●■		●	■		■	■	■	■	
Shelter and Housing	●	●			●□			●□		●[7]

[3]LFA = Lead Federal Agency; FRMAC = Federal Radiological Monitoring and Assessment Center; DFO = Disaster Field Office; JIC = Joint Information Center.

[4]Treatment and consultation regarding acute radiation

[5]States are encouraged to conduct radiation monitoring/sampling activities in coordination with FRMAC.

[6]Whole-body counting of general population

[7]Provides financial assistance for housing, food, and transportation

EMERGENCY RESPONSE RESOURCES AND RESPONSIBILITIES

States

Responsibilities

States generally have the authority and responsibility to develop and implement a comprehensive emergency management system. They develop plans, conduct training, exercise the plan, and coordinate with State and local governments. State and local governments have primary responsibility for determining and implementing protective actions for the public. The States will advise the local jurisdictions on the criteria for temporary and permanent reentry and return.

The States have their own responsibilities for releasing information to the public and may disseminate that information at the utility's Joint Information Center (JIC).

Resources

State resources include the expertise to manage the State response. The State may have a cooperative assistance arrangement with other States in the area.

States have the resources of their many agencies to address emergency concerns. The State agency responsible for emergency management is charged with coordination of activities including implementation of Protective Action Recommendations. Offices of radiological health, generally located in the State health departments, provide a radiation monitoring capability. Some States have laboratories that can analyze samples. They may also conduct training programs and coordinate decontamination activities.

The State usually has an emergency operations center for directing its activities in response to the event. The States also have the Army National Guard as a resource. The States will advise the local jurisdictions on the criteria for temporary reentry and permanent return.

The States may use the services of contract organizations for the removal of contaminated soil. They could also call on the U.S. Department of Transportation (DOT) for excavation equipment, or on the National Guard.

Local Organizations

Responsibilities

Local organizations generally have the authority to implement offsite protective actions.

The local organizations will normally interact with the State on the release of public information. They may send an information coordinator to the JIC.

Local organizations will generally work with States to determine criteria for temporary reentry and permanent return.

Resources

Local organizations generally have considerable resources in the area of law enforcement. Police may be used to provide access control to monitor the safety of the populace, direct traffic, and take any other law enforcement measures that may be required. Local resources may be limited. Most workers are volunteers. They have access to buses and vans for evacuating the population. Many local organizations also have existing relationships with hospitals and have access to buildings that can be used as shelters that will be staffed by volunteer organizations.

Some local organizations have been training emergency workers and staff in low-level radioactive decontamination. States would most likely have varying levels of decontamination training. Prudence would indicate checking for the level of training early in an event.

Utility

Responsibilities

Utilities generate electric power and are responsible for the safe operation of the power plant. They respond to the accident situation on site and assess the extent and significance of any uncontrolled releases. Utilities develop Protective Action Recommendations and communicate them to offsite government agencies. They are in charge of activities associated with returning the facility to a safe condition.

The utility has a continuing responsibility for releasing information to the public and will release that information from the Joint Information Center (JIC).

The utility is responsible for financial assistance associated with the event as defined in the policy held by American Nuclear Insurers. Disposal of contaminated materials (clothing and soil) is also a utility responsibility.

Resources

The organization at the utility includes personnel to operate the plant and provide support in radiation protection and engineering. The resources also include an insurance policy through American Nuclear Insurers and Mutual Atomic Energy Liability Underwriters to estimate costs and provide funds associated with response efforts. The Institute of Nuclear Power Operations has experts who could assist in the evaluation of plant conditions. Vendor groups can assist in analyzing the event. The designer and manufacturer of the nuclear steam supply system could also be utilized. Other nuclear utilities around the country would lend personnel and resources to the response effort.

See the sub-section on the American Nuclear Insurers below for further information on financial assistance.

U.S. Nuclear Regulatory Commission (NRC)

Responsibilities

The basic responsibilities of the NRC are to monitor, assess, and, if necessary, direct the utility to take actions to protect the health and safety of the public. For a radiological incident at a commercial power plant, the NRC is the Lead Federal Agency (LFA). The LFA is responsible for coordinating all Federal onscene actions. The NRC will coordinate Federal assistance to States and local organizations.

A principal role of the LFA is to assist the State in interpretation and analysis of technical information as a basis for making decisions about protective actions. This assistance will begin early in an incident from the NRC Operations Center in Rockville, MD, and later, from the utility's emergency operations facility on scene. The NRC is an independent reviewer of the actions the utility is taking to correct the initiating and related problems. The NRC will assess actual or potential offsite impacts as well, and will make an independent evaluation of Protective Action Recommendations, if necessary. As the LFA, the NRC has the responsibility for coordinating the release of Federal information to the media and others. The NRC will conduct most public information activities from the utility's Joint Information Center. The NRC also will keep the White House and Congress informed on all aspects of the event.

The NRC is responsible for giving the best possible advice at a given time to the States and will not limit its involvement to presenting a series of options.

The NRC also administers the Price-Anderson Act to ensure that the public that is affected by the event has adequate financial assistance to address most emergency needs.

Resources

The NRC has a fully staffed Headquarters Operations Center and Regional Incident Response Centers with communications resources, including an Emergency Telecommunications System for communication with each commercial power plant. The NRC also has more than 100 people on its response staff who are experts in reactor safety, protective measures, and other areas.

The NRC will send a site team comprising some 50 technical experts per shift for a post-emergency response and could provide from 200 to 250 people for all response functions. The NRC also has analysis vans to assist in analyzing samples of the environment in support of Federal Radiological Monitoring and Assessment Center (FRMAC) activities.

How To Access

Early in an event, assistance can be obtained from the NRC Operations Center in Rockville, MD. Once a team has arrived at the site, the NRC will place liaison personnel at all critical locations, but main operations will be conducted at the utility's emergency operations facility, which is the Joint Operations Center for the NRC as the Lead Federal Agency (LFA).

Federal Emergency Management Agency (FEMA)

Responsibilities

The primary role of FEMA is to support and assist the States by coordinating the delivery of Federal non-radiological assistance to State and local organizations. FEMA is the primary point of entry into the Federal system for assistance and information on non-radiological issues for State and local organizations. FEMA also reports Federal coordination activities to the White House when, and if, a Presidential Declaration is made. FEMA will also coordinate Federal assistance to the States, if requested, in implementing protective actions and assessing offsite consequences. It will coordinate Federal assistance to the State(s) in recovery planning, and will coordinate State requests for Federal assistance in the Disaster Field Office (DFO), identifying which Federal agency can best address specific needs.

FEMA will contribute its input for the release of public information through the LFA at the Joint Information Center (JIC) and/or the DFO.

When There Is a Presidential Declaration of Emergency. The Robert T. Stafford Disaster Relief and Emergency Assistance Act, P.L. 93-288 as amended by P.L. 100-107, provides guidance to State and local organizations requesting a Presidential Declaration of Emergency or Major Disaster. This act was originally written for responding to natural disasters but has been expanded to include technological emergencies, such as those affecting nuclear power plants. Title V of that act gives the President authority to take appropriate action through the Federal agencies to address the accident response and ensure that the full complement of Federal resources can be brought to bear on that response. Section 302 of the act calls for the President to appoint a Federal Coordinating Officer. Executive Order 12673 delegates the presidential responsibilities identified in the Stafford Act to FEMA; 44 CFR Part 206 addresses FEMA's implementation of the Stafford Act.

Federal agencies will respond to radiological emergencies using the Federal Radiological Emergency Response Plan (FRERP); with or without a Stafford Act Declaration. FEMA will coordinate the Federal non-radiological response support using the "Emergency Support Function" (ESF) structure of the Federal Response Plan (FRP). The FRP also provides the guidance for implementing the Stafford Act.

The Stafford Act is invoked by a Presidential Declaration of Emergency or Major Disaster. Under these conditions, the FEMA role is primarily one of coordination. FRERP infrastructure remains intact but FEMA's role and responsibilities are expected to be

significantly augmented. The governor of an affected State must make a request for a Declaration of Emergency or Major Disaster to the President through the Emergency Information Coordination Center at the Federal Emergency Management Agency (FEMA) headquarters. The governor must make a statement to the effect that the situation is clearly beyond the State's response capabilities and those of the local and volunteer organizations. FEMA will conduct a preliminary damage assessment after which it will report to the President, who will appoint a Federal Coordinating Officer to coordinate Federal response efforts (typically delegated to FEMA). FEMA can then utilize "mission assignment" authorities under the Stafford Act to direct another Federal agency that does not have authority on its own to take specific action to save lives and protect property. A mission assignment could be made with reimbursement to the responding Federal agency. Under the Stafford Act, FEMA could also provide financial assistance to State and local governments. But, importantly, there would be no duplication of the monetary assistance that could be provided under the Price-Anderson Act through the American Nuclear Insurers and Mutual Atomic Energy Liability Underwriters.

When There Is No Presidential Declaration of Emergency. FEMA coordinates Federal assistance as described under the Federal Radiological Emergency Response Plan (FRERP). Specifically, FEMA would coordinate the provisions of Federal offsite non-radiological assistance through the Lead Federal Agency (LFA) using the structure of the Federal Response Plan (FRP).

Resources

The Disaster Field Office (DFO) is established by FEMA for coordinating Federal non-radiological assistance to the States. FEMA maintains regional and headquarters response and support teams.

FEMA is staffed by experienced emergency response personnel who have deployable and transportable communications capabilities. FEMA has a working relationship with State and local emergency response agencies in natural hazards response.

Under a Presidential Declaration of Emergency, FEMA also has funding available determined on a cost-shared basis up to $5 million. This can be augmented by petitioning Congress for additional funds if required. Under the disaster declaration process, FEMA can reimburse State and local governments for some of their extraordinary costs.

FEMA can provide fixed, transportable, temporary housing. It can assist in the removal of debris and in distribution of medicine, food, and other consumable supplies.

How To Access

Early in an event, FEMA response personnel will go to the FEMA Emergency Information Coordination Center at FEMA headquarters and from there will make operational decisions.

Utilizing the Federal Radiological Emergency Response Plan (FRERP) and the Federal Response Plan (FRP), the Federal Emergency Management Agency (FEMA) will conduct its operations from the Disaster Field Office (DFO) near the site.

U.S. Department of Energy (DOE)

Responsibilities

Among its responsibilities as a support agency, DOE will coordinate the offsite radiological monitoring and assessment for the Lead Federal Agency (LFA) and the State during the initial phases of the emergency. It will maintain a common set of offsite radiological data and provide an appropriate interpretation of the data to the LFA and the State. DOE will manage the Federal Radiological Monitoring and Assessment Center (FRMAC), which is a multi-agency facility. DOE will conduct environmental monitoring, including air, ground, and water.

DOE will contribute its input for the release of public information through the LFA at the Joint Information Center (JIC).

Resources

DOE resources include technical laboratories, radiation monitoring and assessment, and dose assessment capabilities. It has labs for analysis and major logistics capabilities to respond to a variety of emergency situations.

The FRMAC may have up to 300 employees from different organizations working cooperatively. It can be operational within 24 hours. The FRMAC is equipped to be self-sufficient, with the intent to provide assistance to the State, not to burden it. The FRMAC will also establish communications systems and logistics support.

The DOE will deploy field teams with instruments for measuring radiological contamination. It has experienced technical personnel and specialized radiological assistance assets. It can provide medical assistance through the Radiation Emergency Assistance Center/Training Site, which includes medical health physicists who operate out of Oak Ridge National Laboratories.

FRMAC will be the central location where Federal field monitoring data are gathered, organized, evaluated, coordinated, and disseminated to decision makers. The DOE is initially charged with setting up this operation.

DOE will operate the Atmospheric Release Advisory Capability, which is a computer model used to project offsite doses as a result of a release of radiation to the environment. The Radiological Assistance Program teams will serve as a small, first-response group deployed from DOE operational offices that could be called upon to do offsite field monitoring and

assessments and other Federal Radiological Monitoring and Assessment Center (FRMAC) functions under the U.S. Department of Energy (DOE).

The Aerial Measuring Systems will be used to fly over an affected area to determine ground concentrations of radioisotopes and to yield early isopleths for decision makers. Fixed-wing aircraft and helicopters are used to perform this task. Ground systems help planes fly precise grids to yield useful footprints of the area.

A Geographic Information System will be used in conjunction with a Global Positioning System to track sampling information and produce standardized maps for response personnel.

How To Access

Federal Radiological Monitoring and Assessment Center. Call the U.S. Nuclear Regulatory Commission (NRC) or DOE Headquarters Operations Center directly.

The Radiological Assistance Program. Call one of the 8 DOE Operations Offices directly.

The Atmospheric Release Advisory Capability. Contact through the NRC or call the DOE Operations Center directly.

The Aerial Measuring System. Request through the NRC or the DOE, directly.

The Radiation Emergency Assistance Center/Training Site. Can be contacted directly, or through the NRC, or through the DOE Operations Center.

U.S. Environmental Protection Agency (EPA)

Responsibilities

The EPA response under the Federal Radiological Emergency Response Plan is provided in two major areas. First EPA provides human and material resources to DOE to support field monitoring early in the response and to continue responding to the event until the site is restored. The EPA will assume the management of the FRMAC from DOE at a mutually agreed-upon time. It will manage the assessment of offsite monitoring data conducted at the FRMAC. Working with local organizations, States, and other Federal agencies, the EPA will assist in the development of a long-term monitoring component of a recovery plan, including site restoration. The EPA will participate in long-term monitoring and implementation of the site restoration options selected, including making certain that the radiation criteria have been met.

Second, through the Advisory Team for the Environment, Food, and Health, the EPA will provide protective action guidance and recommendations for emergency radiation exposure levels as part of the Federal effort under the Lead Federal Agency (LFA). The U.S.

Department of Agriculture (USDA) and the U.S. Department of Health and Human Services (HHS) also participate on the Advisory Team.

The U.S. Environmental Protection Agency (EPA) will assist in developing protective action recommendations on long-term exposure and relocation options for reentry and return of the population.

The EPA is working on standard protective action guides for recovery, but currently none exist.

The EPA will contribute its input for the release of public information through the LFA at the Joint Information Center (JIC).

Resources

The EPA has 25 or more well-equipped field team personnel who routinely support the Nevada test site. The EPA has laboratories in Las Vegas that are capable of providing the following services and resources:

- Nine germanium detector gamma analysis systems;
- Noble gas separations and analysis;
- Whole-body counter;
- Lung-burden counter;
- Mobile gamma detection van with portable lung-burden system;
- Atmospheric tritium and strontium separations;
- Two support vehicles (one serves as command post and the other as a sample-separation facility);
- A transportable eight-detector sodium iodide system; and
- Enough equipment for five mobile field teams.

Radiation programs available at the Las Vegas facility can supply a mobile laboratory that contains an alpha and beta system, a liquid scintillation system, and two germanium detectors.

The National Air and Radiation Environmental Laboratory in Montgomery, AL, can put 10 equipped teams in the field and also has a mobile counting facility with two gamma spectroscopy systems, as well as a mobile communications vehicle. It has 12 gamma analysis systems, alpha spectroscopy, and alpha, beta, and liquid scintillation counting systems.

The EPA can provide information on relocation, dose reduction methodology, and disposal of contaminated materials.

How To Access

Early in the emergency, the U.S. Environmental Protection Agency (EPA) can be contacted through the Lead Federal Agency (LFA), normally the U.S. Nuclear Regulatory Commission (NRC).

Later (one or two days into recovery) the EPA, as part of the Advisory Team, can be contacted through the NRC as LFA or the U.S. Department of Energy (DOE) at the Federal Radiological Monitoring and Assessment Center (FRMAC). In a long-term response, the EPA will manage the FRMAC.

U.S. Department of Agriculture (USDA)

Responsibilities

A major USDA concern, in the event of a radiological emergency, is food safety. The Food Safety and Inspection Service is the lead USDA agency for radiological emergency response. The principal USDA role is to provide guidance and assistance to State and local governments. Two major areas in which assistance can be provided are:

- Development of agricultural Protective Action Recommendations; and
- Agricultural damage assessment.

Food inspection is a major USDA responsibility during a radiological emergency. Meat, meat products, poultry, poultry products, and egg products must be declared safe and wholesome before they are distributed to consumers.

During the recovery phase the USDA, through the Advisory Team, will assist State and local governments in developing a recovery plan and in developing Protective Action Recommendations regarding the ingestion exposure pathway.

USDA will develop information for public news releases and announcements through the LFA at the Joint Information Center (JIC).

Resources

USDA has a State Emergency Board in each State as well as one that supports Puerto Rico and the Virgin Islands, and as of December 1995, approximately 2700 County Emergency Boards in counties and parishes throughout the country. In an emergency, the USDA, through the emergency electronic mail network of the Cooperative Extension System, can provide information to the agricultural community, supplementing other forms of information that might be available, to help communities return to normal conditions following a radiological emergency. USDA can provide, under certain conditions, food coupon assistance and can assist in the reallocation of USDA donated food supplies from warehouses, schools, and other outlets, to emergency care centers. If a local supply of animal feed is

contaminated, the U.S. Department of Agriculture (USDA) can identify alternative sources of feed.

USDA can monitor the production, processing, and distribution of food through the wholesale level to ensure either the elimination of contamination in that food or to ensure that contamination has been reduced to a safe level.

USDA can assess damage to local crops, soil, livestock, poultry, and processing facilities.

USDA veterinarians can provide advice on how to dispose of livestock and poultry that are contaminated.

USDA employs experts in forestry, soil science, animal husbandry, plant life, food safety, and public health who can assist in planning for decontamination following a nuclear emergency at a commercial power plant.

USDA can provide approximately 6 to 10 employees at the local level who can support the Federal Radiological Monitoring and Assessment Center (FRMAC) in the collection of agricultural samples. The U.S. Food and Drug Administration (FDA), and the Food Safety and Inspection Service, USDA, can provide information on levels of contamination in food that may require embargo or quarantine.

USDA maintains an inventory of both single family and multiple housing units that are unoccupied and can be used as temporary housing by evacuees.

How To Access

USDA can be contacted early in the event either directly or through the U.S. Nuclear Regulatory Commission (NRC) as Lead Federal Agency (LFA) for Advisory Team functions, or through the Federal Emergency Management Agency (FEMA) for non-radiological support.

Later on, USDA can be contacted either at FRMAC for Advisory Team functions or at the Disaster Field Office (DFO) for non-radiological support.

U.S. Department of Health and Human Services (HHS)

Responsibilities

The role of HHS is to assist State and local health officials with the assessment, preservation, and protection of human health and to help ensure the availability of essential human services. The principal HHS response will come from the Public Health Service. The lead for the Public Health Service response has been assigned to the Centers for Disease Control and the U.S. Food and Drug Administration (FDA).

The U.S. Food and Drug Administration (FDA) can provide information on levels of contamination in food that may require embargo or quarantine.

The U.S. Department of Health and Human Services (HHS) will assist in ensuring the continuity of health care for persons in the affected area. HHS will also assist in providing crisis counseling to victims of the emergency.

HHS will provide assistance in assessing the health impact of radiological incidents, guidance on disease control measures, and in developing epidemiological surveillance and study of exposed populations to assess long-term effects.

HHS provides protective action guidance for food safety and animal feed, and provides guidance on the use of radioprotective substances (e.g., thyroid-blocking agents).

HHS will contribute its input for radiological content in news releases and announcements through the Lead Federal Agency (LFA) at the Joint Information Center (JIC).

Resources

From the eight Federal health agencies that make up the Public Health Service, a wide variety of public health expertise is available to assist State and local health officials in developing health surveillance systems, to assist in providing necessary training, and assist in making relocation and other types of decisions. Also, from within these agencies, health care professionals can be called on to augment local staffs, and assistance can be provided in locating medicines and other types of medical resources.

HHS has field teams that can assist in sampling and field monitoring, and can also provide laboratory support in the Federal Radiological Monitoring and Assessment Center (FRMAC).

How To Access

Early in an event, HHS can be contacted either directly or through the U.S. Nuclear Regulatory Commission (NRC) as Lead Federal Agency for Advisory Team functions, or the Federal Emergency Management Agency (FEMA) for non-radiological support.

Later on in an event, HHS can be contacted either at the FRMAC for Advisory Team functions or at the Disaster Field Office (DFO) for non-radiological support.

American Nuclear Insurers (ANI)

Responsibilities

The Price-Anderson Act provides that there be prompt handling, investigation, and settlement of claims for legal liability arising out of or resulting from a nuclear incident or precautionary evacuation.

In compliance with the Price-Anderson Act, two insurance pools, American Nuclear Insurers and Mutual Atomic Energy Liability Underwriters (ANI/MAELU), provide nuclear power reactor operators with nuclear energy liability coverage.

The capacity for the primary layer of coverage, written by ANI/MAELU in the amount of $200 million, is provided by some 250 major U.S. insurance companies who are members of one pool or the other.

Under the Price-Anderson Act, a second layer of financial protection applies to the liability of utilities that exceeds the primary $200 million layer. All nuclear power reactor operators participate in a Master Policy issued by ANI and MAELU providing this second layer of financial protection. Each power reactor operator contributes to paying the excess liability costs of any participating reactor facility if its liability exceeds $200 million. Each reactor operator is responsible for up to $79 million of the excess costs for each nuclear incident. Thus, with 109 reactors participating in the program, the amount of additional protection provided in the second layer is $9 billion. Should these funds also be exhausted, the Congress is committed to providing additional funds as required.

In the event of a properly declared evacuation or precautionary evacuation, ANI/MAELU will establish one or more claims office near the area to provide emergency financial assistance to people who are evacuated as a result of the incident. Information on the availability of financial resources will be communicated directly to the public. The emergency financial assistance provided is for reasonable additional living expenses such as housing, food, and transportation. ANI/MAELU will advance money for estimated future expenses; if they are not incurred, this money is to be returned.

Claims for other than emergency financial assistance or suits against municipalities will be evaluated separately by ANI/MAELU. This evaluation will include determining whether the utility or any other person or organization, which might include a State or its subdivisions (excluding the United States of America or any of its agencies), is legally obligated to pay damages because of bodily injury, property damage, or as covered environmental cleanup costs because of environmental damage caused by the nuclear energy hazard.

Property damage may include contamination of the environment from smoke or radiation associated with traditional liability property damage claims. It might also include such economic loss as lost business profits or reduced property value, if either is the result of physical injury.

Bodily injury includes injury, sickness, or disease, including a resulting death, sustained by any person.

The Price-Anderson Act additionally provides that any legal liability arising out of or resulting from a nuclear incident or precautionary evacuation shall include all reasonable additional costs incurred by a State, or a political subdivision of a State, in the course of responding to a nuclear incident or a precautionary evacuation. Some costs are inherent within the local government and have to be incurred. Specific State and local expenditures that would qualify for coverage are emergency food, shelter, transportation, and police services for the period of time associated with the evacuation plus 30 days.

The State or municipality seeking reimbursement shall furnish, within 12 months after the evacuation, a complete statement of all additional costs claimed, showing in detail the amount, purpose, date incurred, payor, and payee of each expenditure.

Resources

American Nuclear Insurers and Mutual Atomic Energy Liability Underwriters (ANI/MAELU) will be notified following a utility's declaration of an Alert, Site Area Emergency, or General Emergency.

Upon receipt of this notification, information regarding the event will be continuously monitored by staff and if appropriate, even though evacuation has not been ordered, action may be taken to establish one claims office or more.

If an evacuation has been ordered prior to ANI/MAELU notification, claims offices will be established within 24 to 48 hours.

The claims office will initially be established and staffed by ANI/MAELU personnel. As soon as they can be assembled, member company personnel will take over the operation, providing as many people as necessary for an efficient claims handling operation. More than 100 company employees are immediately available for this task.

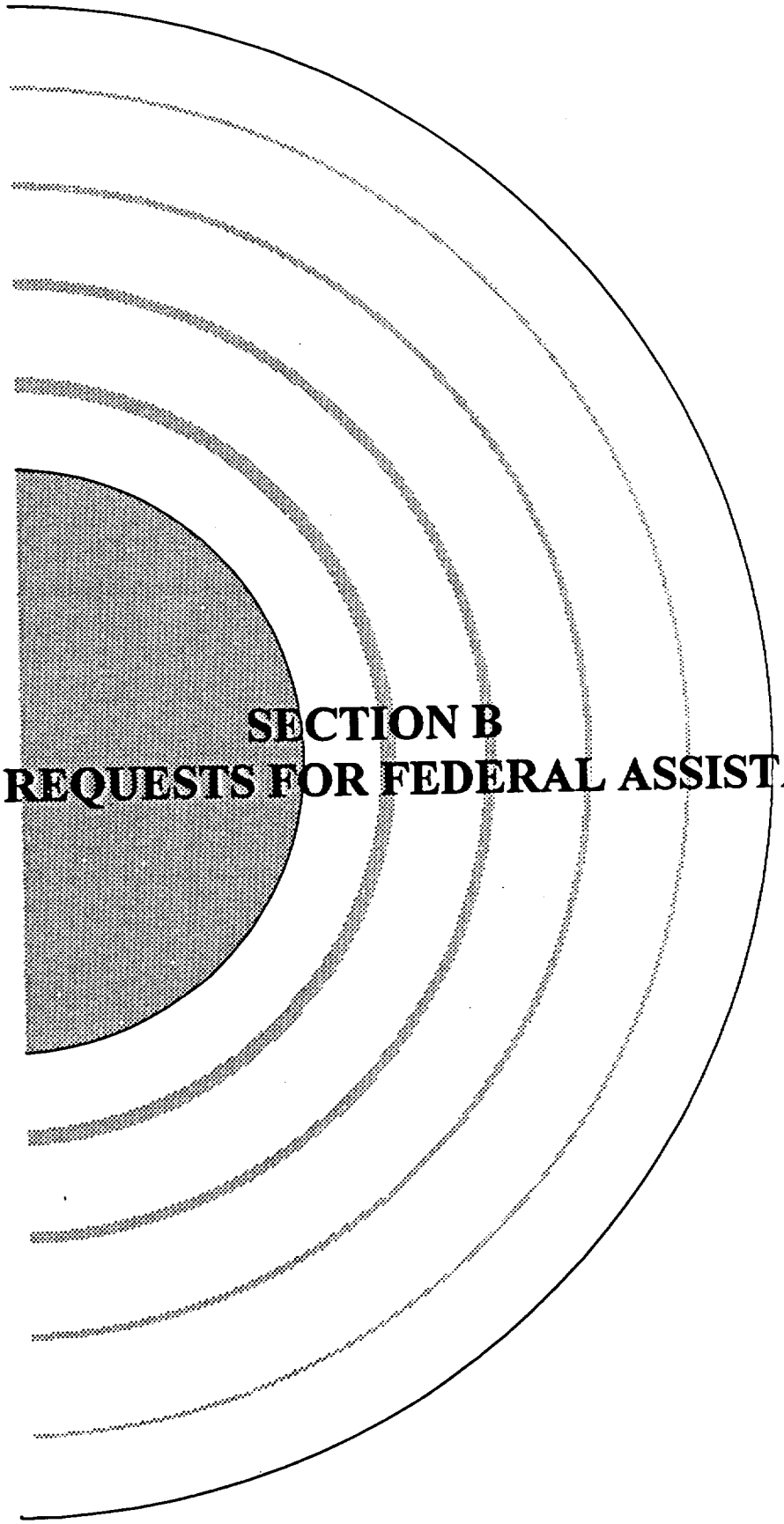
ANI/MAELU has assembled supply kits that contain necessary forms, papers, pencils, check blanks, and the like. They will look to State and local officials to help expedite the procurement and establishment of claims offices.

Further information on the resources available for nuclear power plant emergencies under the Price-Anderson and Stafford Acts is contained in NUREG-1457.

How To Access

American Nuclear Insurers and Mutual Atomic Energy Liability Underwriters (ANI/MAELU) would normally be contacted through the utility. In addition to establishing claims offices, ANI/MAELU will have representation in the Disaster Field Office (DFO) for resolving claims disputes.

B



SECTION B
STATE REQUESTS FOR FEDERAL ASSISTANCE

SECTION B
STATE REQUESTS FOR FEDERAL ASSISTANCE

Page

STATE REQUESTS FOR FEDERAL ASSISTANCE

Objective

To identify Federal organizations responsible for providing needed services to the State(s).

Discussion

When an accident with a release or potential release of radioactive material involves a facility or shipment licensed by the U.S. Nuclear Regulatory Commission (NRC) or an Agreement State, the NRC becomes the Lead Federal Agency (LFA) under the Federal Radiological Emergency Response Plan (FRERP). The LFA is responsible for coordinating all Federal onscene actions and ensuring that the Federal Emergency Management Agency (FEMA) and other Federal agencies assist the State, Tribal, and local government agencies when Federal assistance is needed.

This procedure should be used to respond to requests directed to the NRC from States. States may make requests through their representatives in the Federal response centers, State Emergency Operations Center (EOC) or the Emergency Operating Facility (EOF).

If the request is from a local government, private group, or individual, refer the requestor to the State EOC or the State representative in the Disaster Field Office (DFO) onscene. If the request is from another Federal agency, refer the request to the DFO, Federal Radiological Monitoring and Assessment Center (FRMAC), Joint Information Center (JIC), or other group or agency as appropriate.

Step 1

Review the Summary of Federal Response.

Step 2

Use the attached Issue Resolution Guide to determine the facility to which questions and issues should be addressed.

Step 3

If the facility identified is not operational, go to Step 4.

If the facility identified is operational, refer the issue directly to the NRC Emergency Response Coordinator (ERC) in that facility or to the Field Office Coordinator in the NRC Field Office, when that is the indicated contact.

Go to Step 5.

Step 4

If the facility is not yet operational or the NRC lead has not yet been transferred to the site, direct the questions as follows [representatives located in the NRC Operations Center, White Flint, MD, can be reached through (301) 816-5100 or (301) 951-0550]:

Function	Contact/Facility
Protective Actions	Protective Measures Team (PMT), NRC Operations Center
FEMA	FEMA representative in the NRC Operations Center (contact through the Federal Liaison in NRC Operations Center)
Emergency Support Functions (ESFs)	FEMA representative in the NRC Operations Center (contact through the Federal Liaison in the NRC Operations Center)
FRMAC/DOE	DOE representative in the NRC Operations Center (contact through the Federal Liaison)
Advisory Team (EPA, HHS, USDA)	Protective Measures Team (PMT) in the NRC Operations Center
Radiation Emergency Assistance Center/ Training Site (REAC/TS)	DOE representative in the NRC Operations Center (contact through Federal Liaison)
Public Affairs	Public Affairs Liaison, NRC Operations Center
NRC Field Office	(Exposure control on scene) Regional Office Base Team
	(Resources) Operations Support Team (OST), NRC Operations Center
Reactor Status	Reactor Safety Team, NRC Operations Center

Step 5

The NRC representative in the facility (or the Federal Liaison in the NRC Operations Center) will refer the request to the appropriate group and track the resolution of the request.
Sources: FRERP, FRP, NUREG-1442.

SUMMARY OF FEDERAL RESPONSE

Notification Responsibilities

If the radiological incident involves a facility or material licensed by the NRC or an Agreement State, the NRC becomes the LFA under the FRERP. As LFA, the NRC must notify FEMA, the U.S. Department of Energy (DOE), and Advisory Team agencies [the U.S. Environmental Protection Agency (EPA), U.S. Department of Health and Human Services (HHS), the U.S. Department of Agriculture (USDA)] and verify that the State and other Federal agencies have been notified. These notifications are made from the NRC Operations Center.

The NRC, under interagency agreements and understandings, must also notify other Federal agencies of the following situations:

- Any release or potential release of radioactive material into the environment;
- Any emergency at any NRC-licensed facility;
- An event at an NRC-licensed facility with considerable public or congressional interest; or
- An emergency at a foreign facility, even if there are no consequences in the United States.

The NRC will normally learn of an incident involving a facility or material that it licenses from the licensee. However, NRC staff, other Federal agencies, and others who hear of one of the above events from a source other than the NRC or FEMA should inform the NRC Operations Center [(301) 816-5100 or (301) 951-0550]. The NRC must verify the accuracy of notifications it receives before notifying other agencies.

The following information should be given to the NRC Operations Center:

- Where the incident happened;
- What happened;
- When the incident happened;
- What quantity and type of release;
- Any protective actions taken;
- Whom to contact for more information (name and number); and
- Any assistance requested (radiological and non-radiological).

Federal Plans That May Be Used in Response to a Radiological Emergency

Federal Radiological Emergency Response Plan. Federal agencies respond to radiological emergencies using the FRERP. The NRC would be the LFA for an incident involving either a nuclear facility or the transportation of radioactive materials when the facility or shipment is licensed by the NRC or an Agreement State. The LFA has responsibility for coordinating the overall Federal response to the emergency and the technical assistance on scene. FEMA is responsible for coordinating non-radiological Federal support using the structure of the Federal Response Plan (FRP).

NRC's responsibilities as the LFA include the following:

- Coordinating all Federal onscene actions;
- Overseeing the onsite response, monitoring and supporting the owner or operator's activities, and providing Federal information about onsite conditions;
- Assisting the State, Tribal, and local governments in determining measures to protect life, property, and the environment by providing technical information and protective action recommendations, if possible in conjunction with FEMA, EPA, HHS, USDA, and other Federal agencies, as necessary;
- Coordinating Federal information to the public, media, White House, and Congress; and
- Coordinating the overall activity of Federal agencies involved in the recovery process.

Other Federal groups and agencies have the following responsibilities:

- The Advisory Team for Environment, Food, and Health (EPA, HHS, USDA, and other Federal representatives as needed) advises the LFA and State on scene on environment, food, and health issues and interprets protective action guidance.
- FEMA coordinates non-radiological Federal resources from the onscene Disaster Field Office (DFO), using the Emergency Support Functions defined in the FRP.
- DOE and EPA coordinate all Federal offsite radiological monitoring and assessment activities as directed by the LFA in support of the State needs. DOE provides the coordination during the early and intermediate phase, with EPA assuming long-term coordination of Federal assistance. Assistance may range from initial radiological monitoring assistance to a larger effort coordinated from an onscene Federal Radiological Monitoring and Assessment Center (FRMAC).

- The U.S. Department of Transportation (DOT) identifies sources of civil transportation and coordinates Federal civil transportation response. DOT provides technical advice, assistance, and exemptions on transportation of radioactive materials.

- The Department of the Interior (DOI) provides liaison between federally recognized Indian Tribal governments and the LFA, State, and local agencies and assists when U.S. territories are impacted by the accident.

- The U.S. Department of State (DOS) interacts with foreign governments for incidents either originating in the United States with potential foreign environmental impact or originating outside the United States with potential environmental impact within the United States.

- The Federal Bureau of Investigation (FBI) manages and directs law enforcement and intelligence aspects of radiological sabotage and terrorism incidents. The FBI and LFAs have formal agreements for interface, coordination, and technical assistance.

Federal Response Plan. The FRP is activated when the President declares an emergency under the Stafford Act. A Federal Coordinating Officer (FCO) is appointed to coordinate the overall Federal response in support of State and local governments. Under the FRP, the types of assistance a State is most likely to need are grouped into 12 Emergency Support Functions (ESFs), each headed by a primary agency. When the FRP is activated, the ESFs serve as the primary mechanism through which Federal assistance is coordinated and provided to the State(s).

When an associated radiological emergency exists, the functions and responsibilities of the FRERP remain the same. There is no ESF for radiological assistance; the LFA identified in the FRERP coordinates the radiological response with the FCO, who is located in the DFO.

The 12 ESFs and the agencies assigned primary responsibility for those ESFs are listed below.

Emergency Support Function	Primary Agency
1. Transportation	U.S. Department of Transportation (DOT)
2. Communications	National Communications System (NCS)
3. Public Works and Engineering	U.S. Department of Defense (DOD), Army Corps of Engineers
4. Firefighting	Department of Agriculture (USDA), Forest Service
5. Information and Planning	Federal Emergency Management Agency (FEMA)
6. Mass Care	American Red Cross (ARC)
7. Resource Support	General Services Administration (GSA)

8. Health and Medical Services	U.S. Department of Health and Human Services (HHS), Public Health Service
9. Urban Search and Rescue	FEMA
10. Hazardous Materials	U.S. Environmental Protection Agency (EPA)
11. Food	Department of Agriculture (USDA), Food and Nutrition Service
12. Energy	U.S. Department of Energy (DOE)

ISSUE RESOLUTION GUIDE

	Refer to	
Issue	**Facility**	**Functional Group**
Analyses, radiological		
bioassay	DFO	ESF-8 HHS
environmental samples	FRMAC	NRC ERC
Communications		
FAX, E-mail support	EOF	EOF ERC
	NRC Ops Ctr	OST
system assistance	DFO	ESF-2 NCS
Congressional inquiries, relations	NRC Ops Ctr	CA Liaison
Consequence projections	EOF	NRC Protective Measures Coordinator (PMC)
	FRMAC	PMC
Crisis counseling	DFO	ESF-8 HHS
Damage assessment		
agriculture	FRMAC	Advisory Team
non-radiological	DFO	ESF-3 DOD
		FEMA
Decontamination		
advice (crops, food, forest, livestock, poultry)	FRMAC	Advisory Team
advice (people)	FRMAC	NRC ERC, REAC/TS, Advisory Team
advice (property)	FRMAC	NRC ERC, Advisory Team
		ESF-8 HHS
decontamination of public	DFO	ESF-7 GSA with support
supplies	DFO	from LFA (NRC)
Disaster Welfare Information	DFO	ESF-6 ARC

Issue	Refer to: Facility	Refer to: Functional Group
Disposal		
contaminated livestock, poultry	FRMAC	Advisory Team, USDA
contaminated material	DFO	ESF-7 GSA with supports from LFA (NRC)
uncontaminated debris	DFO	ESF-3 DOD
Dose projections	EOF	NRC PMC
	FRMAC	FRMAC ERC
Dosimetry for NRC and support personnel	NRC Field Office	
DOT regulations, exemptions	NRC Ops Ctr	Federal Liaison
	DFO	ESF-1 (DOT)
E-mail support	EOF	EOF ERC
Environmental		
monitoring	FRMAC	NRC ERC
monitoring equipment (additional)	DFO	ESF-7 GSA with supports from LFA (NRC)
sample analysis	FRMAC	NRC ERC
EPA regulations and guidance	FRMAC	EPA, Advisory Team
Evacuation		
crisis counseling for evacuees	DFO	ESF-8 HHS
Disaster Welfare Information	DFO	ESF-6 ARC
expenses for food and housing	EOF	LIC/American Nuclear Insurers (ANI)
	DFO	ANI/FEMA
family location information (postal locator cards)	DFO	ESF-6 ARC
family reunification	DFO	ESF-6 ARC
feeding evacuees	DFO	ESF-6 ARC
mass care	DFO	ESF-6 ARC
medical patients	DFO	ESF-8 HHS, Advisory Team
Exemptions to DOT regulations	NRC Ops Ctr	Federal Liaison
	DFO	ESF-1 (DOT)
Expenses, evacuee	EOF	LIC/ANI/FEMA
Exposure control (NRC and support personnel)	NRC Field Office	
FAX support	EOF	EOF ERC
	NRC Ops Ctr	OST

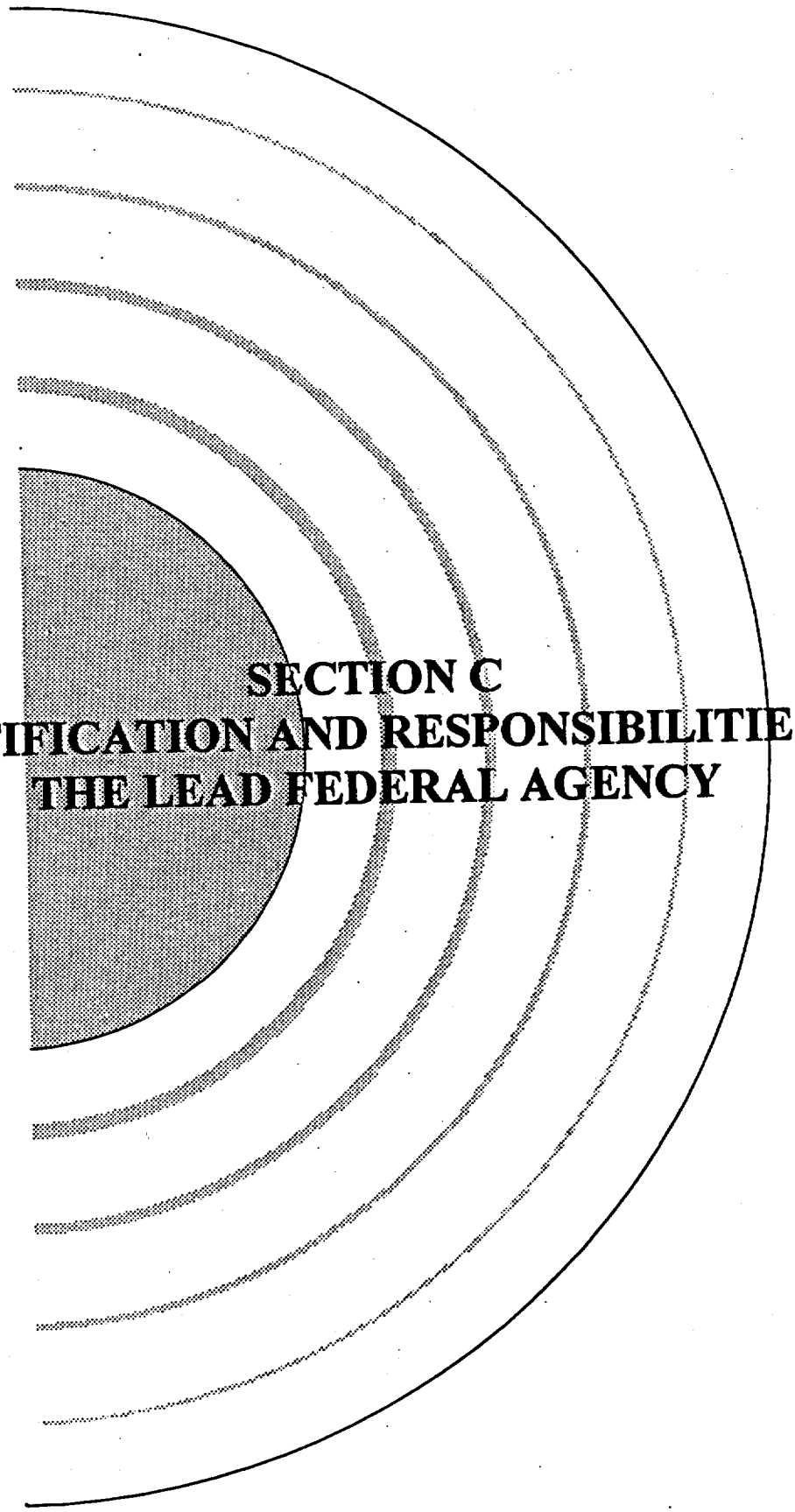
Issue	Refer to: Facility	Refer to: Functional Group
Firefighting		
equipment	DFO	ESF-4 USDA
personnel	DFO	ESF-4 USDA
First aid, public		
non-radiological	DFO	ESF-6 ARC
radiological advice	FRMAC	NRC ERC, REAC/TS, Advisory Team
Food		
expenses of evacuees	EOF	LIC/ANI
	DFO	ANI/FEMA
feeding of public, evacuees	DFO	ESF-6 ARC
protective action assessment	FRMAC	Advisory Team
safety	DFO	ESF-11 USDA, ESF-8 HHS
supply	DFO	ESF-11 USDA, Advisory Team
samples, collection and analysis	FRMAC	NRC ERC, USDA
Fuel	DFO	ESF-7 GSA
GSA support	DFO	ESF-7 GSA
Guidance (see Regulations and Guidance)		
Hazardous materials (non-radiological)	DFO	ESF-10 EPA
Health (see Medical)		
HHS regulations and guidance	FRMAC	HHS, Advisory Team
	DFO	ESF-8 (HHS)
Housing expenses, evacuees	EOF	LIC/ANI
	DFO	ANI/FEMA
Logistics support	DFO	ESF-2 NCS
communications services	DFO	ESF-7 GSA
office equipment, supplies	DFO	ESF-7 GSA
office space		

Issue	Refer to: Facility	Refer to: Functional Group
Medical		
crisis counseling	DFO	ESF-8 HHS
device safety	DFO	ESF-8 HHS
drugs, drug safety	DFO	ESF-8 HHS, Advisory Team
emergency radiological advice	FRMAC	NRC ERC, REAC/TS
first aid for public	DFO	ESF-6 ARC
health surveillance	DFO	ESF-8 HHS
mental health assistance	DFO	ESF-8 HHS
mortuary services	DFO	ESF-8 HHS
patient evacuation	DFO	ESF-8 HHS, Advisory Team
personnel	DFO	ESF-8 HHS
radiological diagnostic, prognostic advice	FRMAC	NRC ERC, REAC/TS
supplies	DFO	ESF-8 HHS
vector-borne disease assessment, assistance	DFO	ESF-8 HHS
victim identification	DFO	ESF-8 HHS
Mental health assistance	DFO	ESF-8 HHS
Milk		
protective action assessment	FRMAC	Advisory Team
sample collection and analysis	FRMAC	NRC ERC
Monitoring		
additional monitoring equipment for personnel	DFO	ESF-7 GSA
airborne	FRMAC	NRC ERC
environmental	FRMAC	NRC ERC
Federal radiological data	FRMAC	NRC ERC
in-vivo counting	FRMAC	NRC ERC, REAC/TS
milk	FRMAC	NRC ERC
personnel for control points	DFO	ESF-7 GSA with supports from LFA (NRC)
Mortuary services	DFO	ESF-8 HHS
Personnel		
additional needed to perform control point monitoring	DFO	ESF-7 GSA with supports from LFA (NRC)
advice on decontamination of personnel	FRMAC	NRC ERC, REAC/TS, Advisory Team
environmental monitoring	FRMAC	NRC ERC
medical	DFO	ESF-8 HHS

Issue	Refer to: Facility	Refer to: Functional Group
Protective action assessments		
early phase PAGs (plume)	EOF	NRC PMC
	FRMAC	Advisory Team
food	FRMAC	Advisory Team
	EOF	NRC PMC
intermediate phase PAGs, including ingestion phase PAGs	FRMAC	Advisory Team
	EOF	NRC PMC
	FRMAC	Advisory Team
milk	FRMAC	Advisory Team
	EOF	NRC PMC
Public		
health and medical assistance	DFO	ESF-8 HHS
information	JIC	
property decontamination	DFO	ESF-7 GSA with support from LFA (NRC)
questions	Published rumor number	
restoration of services	DFO	ESF-3 DOD
shelters for mass care	DFO	ESF-6 ARC
victim identification	DFO	ESF-8 HHS
works and engineering	DFO	ESF-3 DOD
whole body counting	DFO	ESF-8 HHS
Radiation triage	FRMAC	NRC ERC, REAC/TS
Reactor status	EOF	NRC Reactor Safety Coordinator (RSC)
Regulations and guidance and their interpretation		
DOT	NRC Ops Ctr	Federal Liaison
EPA	NRC Ops Ctr/FRMAC	EPA, Advisory Team
EPA PAGs	NRC Ops Ctr/FRMAC	EPA, Advisory Team
GSA	DFO	ESF-7 GSA
HHS	NRC Ops Ctr/FRMAC	HHS, Advisory Team
HHS PAGs	FRMAC	Advisory Team
USDA	NRC Ops Ctr/FRMAC	USDA, Advisory Team
Resource support	DFO	ESF-7 GSA
Rumors, rumor control	Published rumor number	

Issue	Refer to: Facility	Refer to: Functional Group
Sample analysis		
bioassay	DFO	ESF-8 HHS
environmental	FRMAC	NRC ERC
milk	FRMAC	NRC ERC
Sample collection		
bioassay	DFO	ESF-8 HHS
environmental	FRMAC	NRC ERC
milk	FRMAC	NRC ERC
Sanitation and waste		
demolition of structures	DFO	ESF-3 DOD
disposal of contaminated livestock, poultry	FRMAC	USDA, Advisory Team
disposal of contaminated material	DFO	ESF-7 GSA with supports from LFA (NRC)
removal of uncontaminated debris	DFO	ESF-3 DOD
sanitation issues	DFO	ESF-8 HHS
solid waste safety	DFO	ESF-8 HHS
vector borne disease assessment or assistance	DFO	ESF-8 HHS
waste water	DFO	ESF-8 HHS
Search and rescue	DFO	ESF-9 FEMA
Status of Federal response		
non-radiological	DFO	ESF-5 FEMA
overall	EOF	NRC ERC
summaries	NRC Ops Ctr	OST
	EOF	EOF ERC
Structures		
demolition	DFO	ESF-3 DOD
inspections and assessments	DFO	ESF-3 DOD
removal of uncontaminated debris	DFO	ESF-3 DOD
Transportation		
assistance	DFO	ESF-1 DOT
evacuee expenses	DFO	FEMA
regulations	NRC Ops Ctr	Federal Liaison
Triage (radiation advice, assistance)	FRMAC	NRC ERC, REAC/TS
Urban search and rescue	DFO	ESF-9 FEMA
USDA regulations and guidance	FRMAC	USDA, Advisory Team
Waste (see Sanitation and Waste)		

Issue	Refer to	
	Facility	**Functional Group**
Water		
safety of supply	DFO	ESF-8 HHS, Advisory Team
sample collection and analysis	FRMAC	NRC ERC
waste water safety issues	DFO	ESF-8 HHS
Weather forecasts	FRMAC	NRC ERC, NOAA
White House inquiries, reports	NRC Ops Ctr	CA Liaison



SECTION C
IDENTIFICATION AND RESPONSIBILITIES OF THE LEAD FEDERAL AGENCY

SECTION C
IDENTIFICATION AND RESPONSIBILITIES OF THE LEAD FEDERAL AGENCY

Page

IDENTIFICATION AND RESPONSIBILITIES OF THE LEAD FEDERAL AGENCY

Purpose

To identify the Lead Federal Agency (LFA) in an emergency according to the Federal Radiological Emergency Response Plan (FRERP) and to assess the non-radiological conditions in an emergency and determine the need for technical assistance from a specific Federal agency. An emergency is defined as any event with actual or potential adverse effect on the public health and safety.

Discussion

The FRERP identifies the LFA for each specific type of radiological emergency. The agency that owns, authorizes, regulates, or is otherwise responsible for the facility is normally the LFA. However, certain emergencies may be nonradiological in nature or may occur simultaneously with a significant nonradiological event. Under these conditions, the LFA needs the technical assistance of another Federal agency. For example, a chemical emergency at a fuel cycle facility would require the LFA, the U.S. Nuclear Regulatory Commission (NRC), to request the technical assistance of the U.S. Environmental Protection Agency (EPA).

Responsibilities of an LFA are as follows:

- Coordinating all Federal onscene actions;
- Overseeing the onsite response, monitoring and supporting the owner or operator's activities, and providing Federal information about onsite conditions;
- Assisting the State, Tribal, and local governments in determining measures to protect life, property, and the environment by providing technical information and protective action recommendations, if possible in conjunction with the Federal Emergency Management Agency (FEMA), EPA, the U.S. Department of Health and Human Services (HHS), the U.S. Department of Agriculture (USDA), and other Federal agencies, as necessary;
- Coordinating Federal information to the public, the media, the White House, and Congress; and
- Coordinating the overall activity of Federal agencies involved in the recovery process.

Step 1

Identify the LFA by using the FRERP table that follows. In a case in which the NRC receives notification of an event that is not the NRC's responsibility, the NRC notifies the appropriate LFA.

IDENTIFICATION OF LEAD FEDERAL AGENCY FOR RADIOLOGICAL EMERGENCIES

Type of Emergency	Lead Federal Agency
1. Nuclear facility	
a. Licensed by NRC or an Agreement State	NRC
b. Owned or operated by the U.S. Department of Defense (DOD) or U.S. Department of Energy (DOE)	DOD or DOE
c. Not licensed, owned, or operated by a Federal Agency or an Agreement State	EPA
2. Transportation of radioactive materials	
a. Shipment of materials licensed by NRC or an Agreement State	NRC
b. Materials shipped by or for DOD or DOE	DOD or DOE
c. Shipment of materials not licensed or owned by a Federal Agency or an Agreement State	EPA
3. Domestic satellites containing radioactive materials	NASA or DOD
4. Impact from foreign or unknown source	EPA, DOD, or NASA
5. Other types of emergencies	LFAs confer

Generally the NRC is the LFA in accidents for which the NRC has statutory authority. The NRC is therefore the LFA for accidents at all licensed facilities. The "lead" implies that multiple Federal agencies, with statutory responsibilities and/or expertise and capabilities, are involved in the response, and that coordination of such expertise and capabilities is required. If there is no need for response by other Federal agencies, the Federal response will be handled by the agency with the statutory responsibility. The LFA for incidents at most fixed nuclear facilities is the NRC, DOE, or DOD.

The LFA for transportation accidents involving licensed nuclear material is the NRC. The LFA for transportation accidents involving DOE or DOD nuclear material is the owning agency.

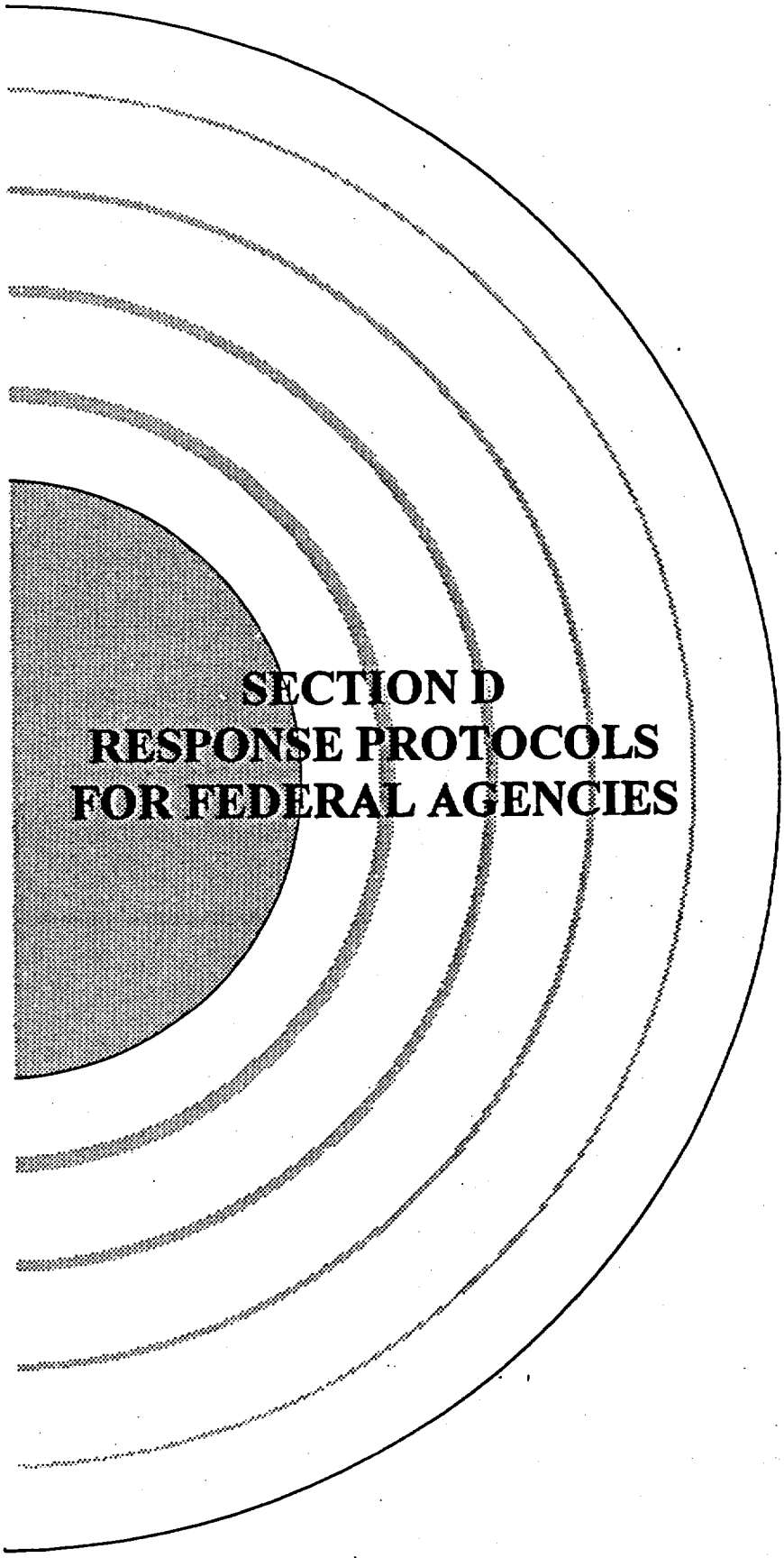
When the source of the nuclear material involved in an accident, transportation or otherwise, cannot be determined, the EPA is the LFA. EPA responsibility extends to include nuclear material of unknown origin or identity found in areas where there is an actual or potential public health and safety issue.

For those events in which there is no release of radioactive material into the environment, as soon as the nuclear material is taken into custody or otherwise secured, the application of FRERP terminates. An example of this type of event includes found radioactive sources in areas accessible by the public.

For events in which there is a release of radioactive material into the environment, the FRERP provides the mechanism for recovery and cleanup. For instance, it is worth noting that the Federal response following the Three Mile Island (TMI) accident continued for many years after the accident to ensure that the effects of the release were adequately addressed.

Note: The application of FRERP to nonemergency events or routine events is not appropriate.

If the LFA is determined to be the NRC, proceed with the coordination of Federal resources to support the State. If the LFA is determined to be another Federal agency, proceed to notify that agency in accordance with the FRERP and be prepared to support the LFA. When in doubt, confer with other potential LFAs to determine the most appropriate LFA.



SECTION D
RESPONSE PROTOCOLS FOR FEDERAL AGENCIES

SECTION D
RESPONSE PROTOCOLS FOR FEDERAL AGENCIES

RESPONSE PROTOCOLS FOR FEDERAL AGENCIES

Purpose

This guide is intended to help Federal agencies prepare for a prompt response to radiological emergencies. Instructions are provided on receiving the initial notification, the types of person to send to the scene, the facility at which such persons are needed, how to get them to that facility, and what they should do when they arrive.

Discussion

This document is a planning guide for those Federal agencies that work with the U.S. Nuclear Regulatory Commission (NRC) during the initial hours of response to a serious radiological emergency in which the NRC is the Lead Federal Agency (LFA). These Federal agencies are:

- U.S. Department of Energy (DOE);
- U.S. Environmental Protection Agency (EPA);
- U.S. Department of Agriculture (USDA);
- U.S. Department of Health and Human Services (HHS);
- National Oceanic and Atmospheric Administration (NOAA); and
- Federal Emergency Management Agency (FEMA);

Federal agencies not specifically mentioned in this guide may also be asked to support the NRC.

Federal agencies may use this guide to help them understand how to work with the NRC during an emergency. The guide describes the NRC's responsibilities as LFA and the concept of operations for coordinating the Federal assessment of protective actions, public information, and radiological monitoring assistance. This guide does not address any of the Federal response functions coordinated by FEMA.

NOTE: During an emergency, if you need to coordinate your agency's response with NRC or the State personnel at the scene, or if you need to know the radiological conditions, contact the NRC Operations Center at (301) 816-5100 or (301) 951-0550. Ask for the Federal Liaison, your agency's representative at the Operations Center, or a member of the Response Coordination Team.

CHECKLIST 1: PREPARING AGENCY RESPONSE

The NRC has assigned coordinators for each major functional response area. The coordinators are responsible for ensuring that the personnel assigned to these functional areas have the materials and procedures they will need for performing their functions. The coordinator also offers personnel the opportunity to attend NRC training related to their functions.

Prior to an event, each response agency should complete the following actions.

- ☐ Contact the NRC to ensure that the following information is current:
  - Phone numbers for initial notification;
  - Procedures;
  - Resources for the Operations Center; and
  - Resources for the "go kit" for the onscene facilities Federal Radiological Monitoring and Assessment Center (FRMAC), Joint Information Center (JIC), and the Advisory Team.
- ☐ Review the distribution list for Status Summaries and press releases to ensure that it meets the agency's needs.
- ☐ Develop procedures for the agency's representatives at all response facilities.
- ☐ Send copies of necessary documents (such as agency phone directories) to the NRC (one set for the Operations Center and several sets for the onscene facilities).
- ☐ Give the NRC a list of the materials needed for performing the agency's function.
- ☐ Recruit the appropriate people; provide for 24-hour staffing at all response facilities for as long as deemed necessary. Make sure they meet the qualifications discussed in this guide.
- ☐ Ensure that appropriate people are trained. The NRC will train representatives of the Federal agencies on the procedures and will invite them to participate in exercises. Procedures are revised after each exercise based on the recommendations of the participants.
- ☐ Be prepared to have people staff the Operations Center and travel to the scene within a couple of hours of notification.

CHECKLIST 2: RECEIVING INITIAL NOTIFICATION

The NRC Headquarters Operations Officer receives notification of an event from the licensee, from another Federal agency, or (for a transportation incident) from the State or a member of the public. The Operations Officer will make notifications within the NRC. If the event warrants, the NRC will begin notifying the Federal agencies. The NRC will advise the agencies of the NRC's response mode and indicate whether or not the agency should send its representative to the NRC Operations Center.

When notified by the NRC, each response agency should perform the following actions.

- ☐ Speed the notification process by asking only for information essential to the response.

  NOTE: This will allow the NRC to fulfill its responsibility to make timely notifications of the event.

- ☐ Record the notification and information.

- ☐ Ask if there are congressional or public affairs inquiries; ensure that the responding agency's Public Affairs and Congressional Affairs staffs coordinate with the NRC's Public Affairs and Congressional Affairs Liaisons.

  CAUTION: Do not send anyone directly to the site of a reactor accident. Arrange through the NRC Operations Center to meet an NRC representative in the vicinity to ensure that appropriate radiological precautions are taken.

CHECKLIST 3: RESPONDING TO THE PROPER FACILITY

A. NRC Operations Center

Federal agencies represented: DOE, EPA, USDA, HHS, NOAA, and FEMA.

The facility: Until qualified personnel arrive at the scene, response functions will be performed from the NRC Operations Center in Rockville, MD. There are 11 teams working in the Operations Center:

- Executive Team (NRC management);
- Reactor Safety Team (accident assessment);
- Protective Measures Team (Federal assessment of the possible radiological consequences);
- Public Affairs Liaison;
- Congressional Affairs Liaison;
- Federal Liaison;
- State Liaison;
- International Liaison;
- Safeguards Team (NRC security assessment);
- Operations Support Team (distribution of updates, logistical arrangements); and
- Response Coordination Team (RCT) (NRC support for the Operations Center).

The representatives from agencies in the Advisory Team for Environment, Food, and Health (EPA, HHS, and USDA) and NOAA will work with the Protective Measures Team until the Advisory Team is established at the scene. The representatives from DOE and FEMA will work with the Federal Liaison. They will act as a point of contact with their agency's response until their on-scene facilities (the FRMAC and the Disaster Field Office (DFO)) are activated. Once the on-scene facilities are activated, the NRC Operations Center shifts its focus to supporting the NRC Site Team, and continues coordinating congressional and media relations in the Washington, D.C., area, responding to international inquiries, and coordinating with FEMA at the Emergency Information and Coordination Center (EICC). At a mutually agreed upon time, the onscene counterparts will assume responsibilities from the Federal agency representatives at the NRC Operations Center.

NOTE: Direct all Federal inquiries about the Federal response to the NRC Operations Center at (301) 816-5100 or (301) 951-0550.

Who to send:

General qualifications	Someone who can coordinate requests for assistance and keep his or her agency informed on the status of the accident and the Federal response.
EPA, HHS, and USDA	Someone who can apply his or her agency's protective action guidance for the Protective Measures Team. Issues not addressed by established policy and not requiring immediate action to protect the public can be forwarded to each agency's headquarters for resolution.
FEMA	Someone who can coordinate non-radiological support.
DOE	Someone who is knowledgeable of DOE's emergency response assets and capabilities and how to activate them.
NOAA	Someone who can supply meteorological information to the Protective Measures Team.

How to get there: The NRC Operations Center is located at:

Two White Flint North
11545 Rockville Pike
Rockville, MD

Two White Flint North is located immediately adjacent to the White Flint Station on the Metro Red Line.

What to do upon arrival:

1. Sign in with the security guard in the lobby on the first floor. Call the NRC Operations Center at (301) 816-5100 or (301) 951-0550 and ask for the Federal Liaison. If the Federal Liaison is unavailable, ask for a member of the RCT. The Federal Liaison or an RCT member will come to the guard station to escort response team members to the Center.

2. Obtain a procedure book; read procedures and appendices. The Advisory Team and the NOAA representative report to the Protective Measures Team area; DOE and FEMA representatives report to the Liaison area.

3. Sign in on the Staffing Board.

4. Report to the team manager or, if the team manager is unavailable, report to the Response Coordination Team Director.

5. Participate with the NRC Response Team to ensure that each agency's guidance and concerns are considered and properly addressed.

B. Advisory Team for Environment, Food, and Health - Reporting to the Scene

Federal agencies represented: NRC, EPA, HHS, USDA

The facilities: Federal Radiological Monitoring and Assessment Center

The FRMAC coordinates Federal field monitoring support and provides offsite radiological conditions to the NRC (as the LFA) and the State. The NRC will disseminate the results of the FRMAC effort to the other Federal agencies, the Advisory Team at the FRMAC, and the NRC Operations Center. The FRMAC is activated and initially operated by the DOE. EPA will assume operation of the FRMAC at a mutually agreed upon time, usually after the emergency phase.

Who to send: Someone capable of applying his or her agency's guidance, keeping his or her agency informed of the NRC actions, and keeping the NRC informed of his or her agency response.

When to send someone: Agencies represented on the Advisory Team will be advised on when to send a representative to the scene, either by the NRC in the initial notification or by their agency's representative at the NRC Operations Center.

How to get there: When notified by the Federal Liaison, prepare to travel and arrange when and where to meet (NRC Operations Center or an airport in the vicinity of accident). Bring agency identification.

NOTE: The NRC can assist in making travel arrangements.

If reporting to the NRC Operations Center:

1. Report to the NRC Operations Center. An NRC representative will accompany Federal responders to the accident scene.

The NRC Operations Center is located at:

Two White Flint North
11545 Rockville Pike
Rockville, MD

Two White Flint North is located immediately adjacent to the White Flint Station on the Metro Red Line.

NOTE: The NRC will bring "go kits" containing agency procedures and resources that the EPA, HHS, and USDA have indicated they would need. NRC will supply basic materials and one computer for all the Federal representatives to share. NRC can arrange both for transportation to and from the airport and for lodging.

2. Sign in with the security guard in the lobby. Call the NRC Operations Center at (301) 816-5100 or (301) 951-0550 and ask for the Federal Liaison. If the Federal Liaison is unavailable, ask for a member of the RCT. The Federal Liaison or an RCT member escort response team members to the Center.

3. Report to the Federal Liaison and receive a briefing that covers

   - where to meet the NRC representative who will accompany the Advisory Team to the accident scene;
   - reviewing the contents of the "go kit" to ensure it contains the materials required at the scene;
   - providing the name, agency affiliation, and Social Security Number of Federal responders to the Federal Liaison; this information will be forwarded to the Site Team to allow access to the emergency response facilities; and
   - reviewing the travel arrangements.

If reporting directly to the scene:

CAUTION: Do not go directly to the accident site. Arrange to meet an NRC representative in the vicinity to verify required radiological protection and appropriate response facility location.

1. Contact the Federal Liaison or RCT to determine whether the responding agency or the NRC are making travel arrangements. Obtain the following:

- the name of the NRC contact at the scene; and
- the destination airport and where and when to meet the NRC contact.

2. Give name, agency affiliation, and Social Security Number to the Federal Liaison.

What to do upon arrival:

1. The NRC representative will meet the Advisory Team as arranged and will contact the Federal Liaison in the NRC Operations Center to obtain status of the accident, appropriate radiological precautions, and directions on how to link up with the Site Team.

2. Report to the NRC Field Office. Obtain dosimetry and a briefing on radiological conditions and precautions before going to the site or other facility.

3. Review the procedure (provided by the NRC representative).

C. Radiological Monitoring Assistance

Federal agency represented: DOE's Radiological Assistance Program (RAP) Team and Federal Radiological Monitoring and Assessment Center (FRMAC) Advance Team.

The facilities: Facilities are not predetermined for these teams. DOE will establish with the State and the NRC the best place to meet at the time of the emergency. The meeting place could be an airport, the State Emergency Operations Center (EOC), or another location, such as the licensee's Emergency Operations Facility (EOF) in a reactor incident.

NOTE: Members of the Protective Measures Site Team will collocate with the FRMAC but will accommodate the State's radiological information needs from any location the State chooses.

Who to send:

RAP Team: Personnel who are qualified to perform radiological monitoring.

FRMAC Advance Team: Personnel who are authorized to represent DOE in working with the State on determining a location for the FRMAC.

When to send someone: If the DOE Regional Coordinating Office or the DOE HQ/EOC receives a request for Federal radiological monitoring resources from a Federal agency, State, local, or Tribal agency, private organizations, or private persons, DOE may dispatch a Radiological Assistance Program (RAP) Team to give help. Responses to requests from private organizations and individuals will be coordinated with the appropriate State or Tribal agency. If the incident exceeds the resource capabilities of the RAP Team, DOE

Headquarters will activate the FRMAC response. After the RAP Team responds, an advance FRMAC party from the DOE (including aerial radiological survey capability) will respond, followed by a full FRMAC team.

How to get there: DOE will make travel arrangements for DOE personnel who respond to the emergency.

At the scene, coordinate with response personnel from NRC, DOE, the State, and the licensee, if applicable, through the DOE Liaison or the Federal Liaison in the NRC Operations Center. The NRC Operations Center can also coordinate with the State, since the State Liaison Team maintains contact with the State personnel who respond to the emergency.

What to do upon arrival: If a meeting place has not been determined before departure, contact the DOE Liaison or the Federal Liaison at the NRC Operations Center to determine the status of the NRC Site Team and current radiological conditions. Arrange where and when to meet with the NRC Monitoring and Analysis Coordinator.

D. Joint Information Center (JIC)

Federal agencies represented: All responding Federal agencies

The facility: The JIC is activated by the licensee at a location designated in the licensee's emergency plan to coordinate the dissemination of media announcements. (If the event is a transportation accident, an appropriate location will be selected.) The NRC will coordinate the dissemination of the radiological information for the Federal Government. Each agency that responds will address its particular area of expertise.

Who to send: Experienced public affairs personnel able to speak for the agency's response efforts at the scene.

How to get there: The NRC will notify the Federal agencies of the JIC location and will recommend travel arrangements to those agencies sending official representatives or support staff.

What to do upon arrival:

1. Present agency identification to the JIC security staff.
2. Report to the NRC Public Affairs Coordinator.
3. Notify the response agency's headquarters of your arrival.
4. Review procedures.

5. Establish contact with the agency's representative on the Advisory Team if necessary.

6. Establish contact with the agency's representative at the Interagency Committee for Public Affairs in Emergencies (ICPAE) National JIC.

7. Formulate media releases about the agency's efforts at the scene.

8. Coordinate the agency's public affairs activities with the NRC Public Affairs staff. (Refer to Sections R and S of this document.)

9. Participate in the media briefings.

10. Ensure that copies of media releases on your agency's efforts are given to the NRC for distribution.

E. Emergency Information and Coordination Center (EICC)

NOTE: This section describes the response to radiological emergencies for the NRC and its support agencies. Additional Emergency Support Functions (ESFs) may be activated by FEMA, which would require additional agency support not mentioned here.

Federal agencies represented: NRC and ESF Support Agencies (Departments of Agriculture, Commerce, Defense, Energy, Health and Human Services, Housing and Urban Development, Interior, Justice, State, Transportation, Veteran Affairs, Environmental Protection Agency, Federal Emergency Management Agency, General Services Administration, National Communications System)

The facility: The EICC will be activated at FEMA Headquarters in Washington, DC.

Who to send:

Emergency Support Team (EST) Representative
Someone who can keep his or her agency informed of the FEMA response, keep the NRC, as an LFA, informed of his or her agency's radiological response, and can coordinate requests for assistance. This person can support the ESFs in the EICC during a response.

ICPAE National JIC Representative
Someone who is an experienced public affairs person, knowledgeable about the radiological aspects of his or her agency's guidance.

Catastrophic Disaster Response Group (CDRG) Representative
Someone who is a high-level policy maker. This group meets only as required, so it does not require 24-hour staffing.

How to get there: The EICC is located at FEMA Headquarters at 500 C Street, S.W., in Washington, DC. Take the Metro (Yellow line) to L'Enfant Plaza; take the Maryland Avenue exit and walk one block east to 6th Street then one block south to C Street.

What to do upon arrival:

1. Present agency identification to the EICC security staff.
2. Report to the Emergency Support Team Director.
3. Notify the agency's headquarters of your arrival.
4. Review procedures.
5. Notify the NRC representative of any radiological response activities your agency is performing.

F. Disaster Field Office (DFO)

NOTE: This section describes the response to radiological emergencies for the NRC and its Support Agencies. Additional ESFs may be activated by FEMA, which would require additional agency support not mentioned here.

Federal agencies represented: NRC and ESF Support Agencies (Departments of Agriculture, Commerce, Defense, Energy, Health and Human Services, Housing and Urban Development, Interior, Justice, State, Transportation, Veteran Affairs, Environmental Protection Agency, Federal Emergency Management Agency, General Services Administration, National Communications System)

The facility: The DFO will be the central location for coordinating Federal non-radiological support to the State. FEMA will activate a DFO, whether or not there has been a Presidential declaration of an emergency. The LFA and FEMA will work with State officials to select a DFO location for Federal and State responders.

Initially, Federal agency representatives may report to the FEMA Regional Operations Center (ROC) then travel to the State EOC. The NRC and Federal agency representatives supporting the radiological aspects of the response will not report to the ROC. When the location of the DFO is identified, the Emergency Response Team, comprised of various Federal agencies will move there and will invite the State to move its operation to the DFO.

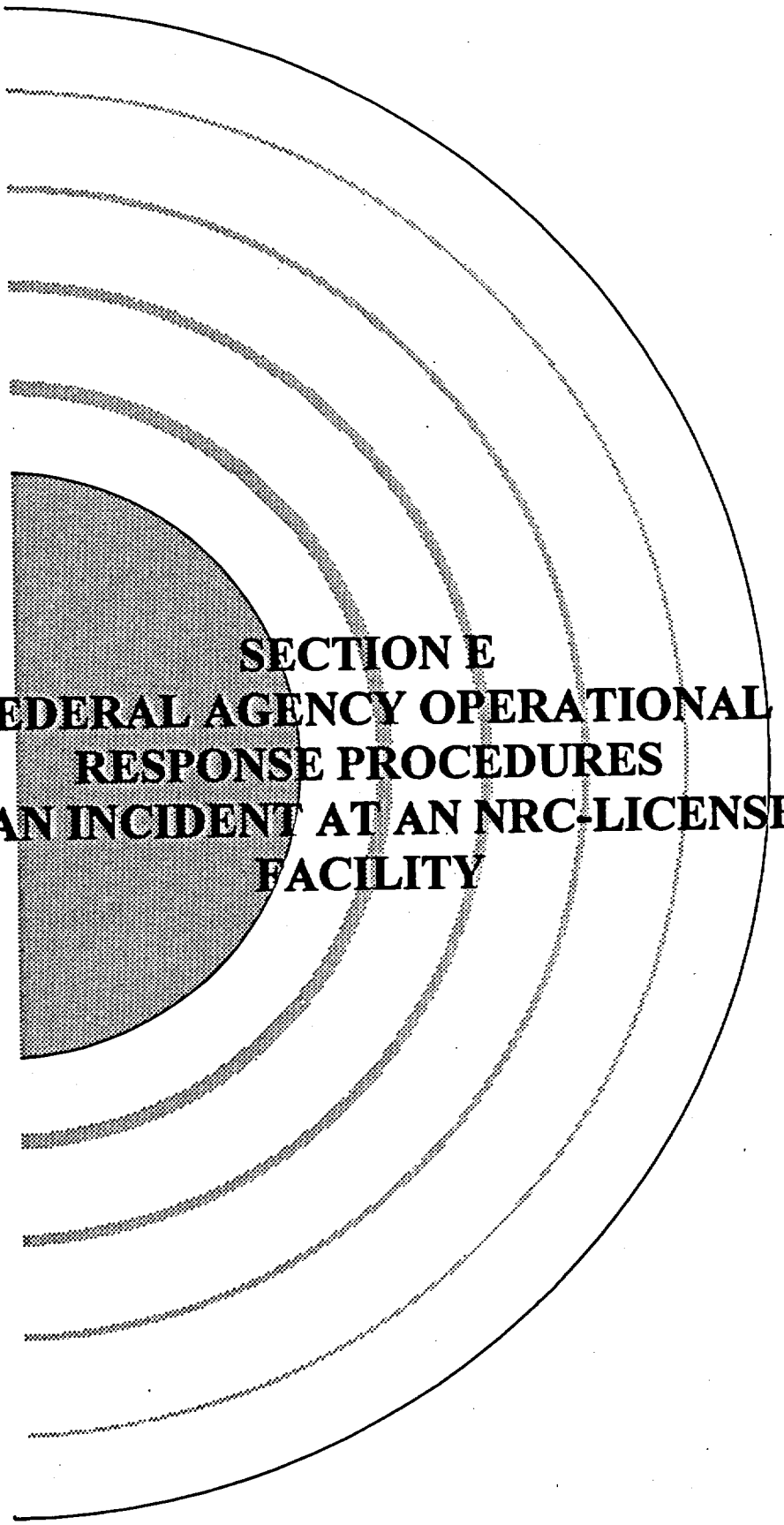
When the NRC is the LFA, the NRC will send a senior technical person to represent the LFA and the agencies supporting the LFA. The NRC will determine the need for representation from the support agencies.

Who to send: Someone who can keep his or her agency informed of the FEMA response, keep the NRC, as LFA, informed of his or her agency radiological response, and can coordinate requests for assistance. This person can support the ESFs in the DFO during a response.

How to get there: When the location of the DFO is determined, FEMA will notify the ESF Primary Agencies of its location.

What to do upon arrival:

1. Present agency identification to the DFO security staff.
2. Report to the Emergency Support Team Director.
3. Notify the response agency's headquarters of your arrival.
4. Review procedures.
5. Notify the NRC representative of any radiological response activities your agency is performing.



SECTION E
FEDERAL AGENCY OPERATIONAL RESPONSE PROCEDURES TO AN INCIDENT AT AN NRC-LICENSED FACILITY

SECTION E
FEDERAL AGENCY OPERATIONAL RESPONSE PROCEDURES
TO AN INCIDENT AT AN NRC-LICENSED FACILITY

OPERATIONAL RESPONSE PROCEDURES TO AN INCIDENT AT AN NRC-LICENSED FACILITY

DEVELOPED BETWEEN
NUCLEAR REGULATORY COMMISSION,
ENVIRONMENTAL PROTECTION AGENCY,
DEPARTMENT OF HEALTH AND HUMAN SERVICES,
DEPARTMENT OF ENERGY,
AND THE
U.S. DEPARTMENT OF AGRICULTURE

NOTIFICATION

1. The NRC Headquarters will notify the designated Headquarters contact at HHS, USDA, and DOE and will notify the National Response Center (who will contact EPA) of each of the following events reported to the NRC Operations Center.

   a. Any event reported by a licensee which is categorized as an Alert, Site Area Emergency, or General Emergency as defined in NUREG-0654, Revision 1 (FEMA-REP-1).

   b. Any reported unplanned atmospheric or liquid release in excess of 20 times the applicable concentrations of 10 CFR 20, Appendix B, Table 2 in unrestricted areas, when averaged over a time period of one hour. [§50.72(b)(iv)]

   c. Any reported lost or stolen source with a potential of serious health effects to the public.

   d. Any reported chemical or hazardous release at an NRC or Agreement State licensed facility.

   e. Any time the NRC is in the Standby Mode or higher.

   f. Any time the NRC deescalates.

   g. Any time the licensee emergency class is deescalated from an Alert, Site Area Emergency, or General Emergency classification.

2. NRC Headquarters will provide as much of the following information as available during the initial notification and any subsequent updates.

Incident/Facility Location
Time of Incident
Licensee Emergency Classification
NRC Response Mode
NRC Major Actions

Reported Radioactive Releases
- Atmospheric
  - Quantity (Total release/release rate)
  - Composition (Major contributing radionuclides)
- Liquid
  - Quantity (Total release/release rate)
  - Composition (Major radionuclides)

Reported Chemical Releases
- Atmospheric
  - Quantity
  - Chemistry
- Liquid
  - Quantity
  - Chemistry

Environmental Measurements
- Licensee
- State
- NRC
- Other

Potential release
- Magnitude
- Time Frame

Stability of Plant Conditions

Meteorological Conditions
- Wind Speed
- Direction
- Stability
- Short Range Forecasts

3. The NRC through Headquarters or through its Region will notify the appropriate EPA and HHS Regional Office of any incident classified by a licensee as an Alert, Site Area, or General Emergency. The NRC Headquarters or Region will notify the appropriate EPA and HHS Region of other incidents which the NRC Region staff feels may be of interest to EPA and HHS.

4. In general, EPA, HHS, USDA, and DOE will not contact NRC licensees about any incident involving NRC licensed activities unless coordinated with the NRC. NRC will maintain responsibility for monitoring a licensee's response and for ensuring that issues are addressed in the appropriate priority.

5. Subsequent to the initial notification and prior to the arrival of representatives from EPA, HHS, USDA, or DOE, updates will be provided periodically as necessary. Until informed otherwise, the update will be provided to the initial agency contact from a member of the NRC Government Liaison Team.

AGENCY REPRESENTATIVES

1. Upon notification that the NRC has gone into Standby Mode, EPA, HHS, USDA, and DOE should consult with the NRC Director of the Protective Measures Team before dispatching one representative each to the NRC Operations Center to determine whether such action is warranted.

2. Upon notification that the NRC has gone into Initial Activation Mode or higher, EPA, HHS, USDA, and DOE each can automatically send one representative to the NRC Operations Center if they have not already done so.

3. NRC will provide each of the EPA, HHS, USDA, and DOE representatives with a desk and telephone in or close to the NRC Operations Center.

4. The contact for the EPA, HHS, USDA, and DOE representatives at the NRC Operations Center will be a member of the Federal Liaison Team. Federal Liaison Team members will be located in the NRC Operations Center.

   The DOE representative will coordinate FRMAC resources. The representatives from EPA, HHS, and USDA, as members of the Advisory Team for Environment, Food, and Health, will be located in the Protective Measures Area.

5. EPA, HHS, USDA, and DOE representatives at the NRC Operations Center will be provided hard copy information which has been approved for distribution outside of the NRC. In addition to any general briefing by the Federal Liaison Team members, arrangements will be made to have NRC Technical Team members brief the EPA, HHS, USDA, and DOE representatives.

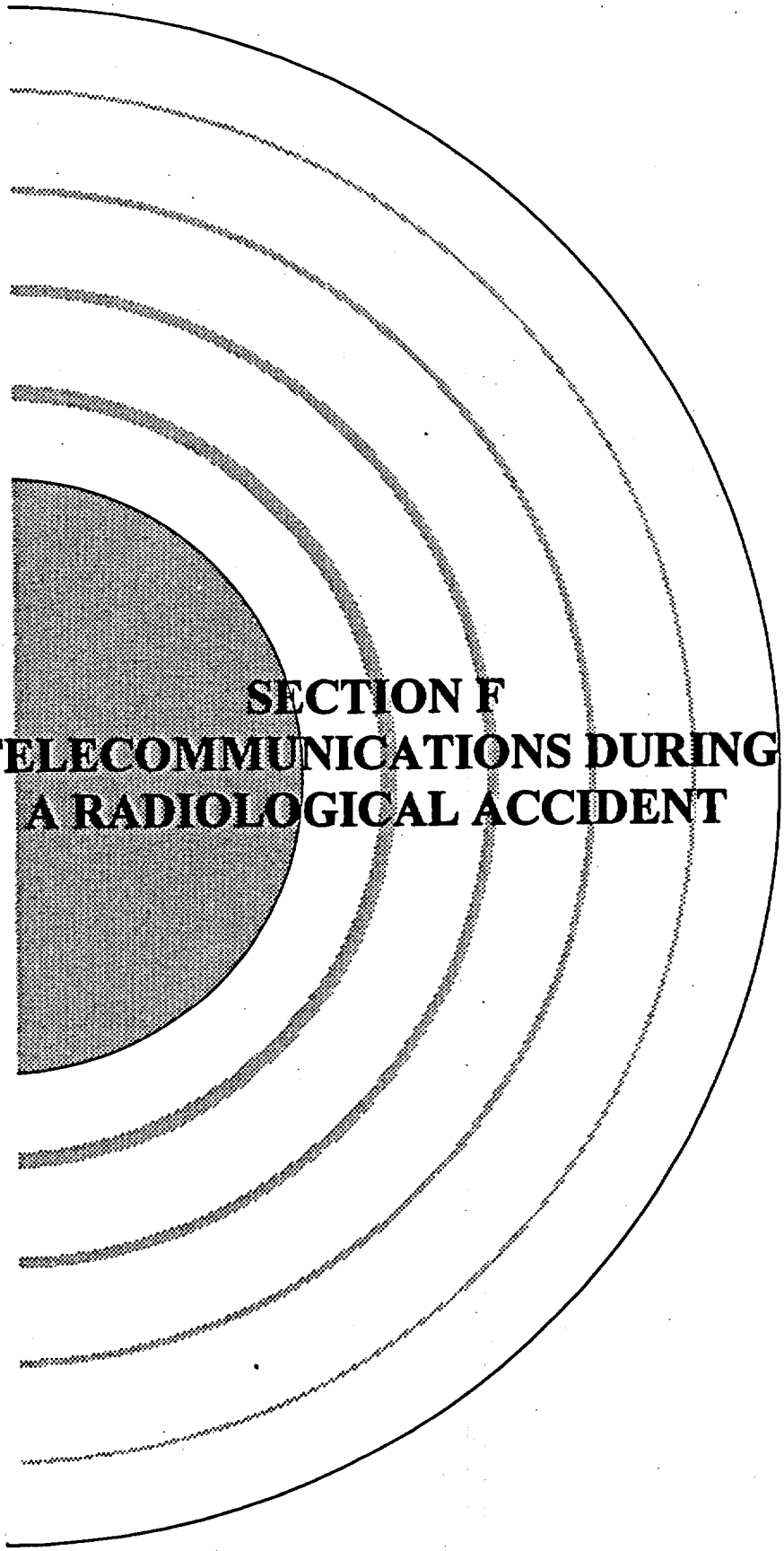
6. EPA, HHS, and USDA representatives, as the Advisory Team, may be called upon to consult with the NRC Protective Measures Team or other response team members. Once established at the NRC Operations Center, the representatives will be conduits for soliciting EPA, HHS, or DOE views on the emergency situation and possible offsite recommendations.

7. Once the NRC appoints a Director of Site Operations (initiation of Expanded Activation Mode), the focus of NRC's actions is at the site and the NRC Operations Center provides support to the DSO. Maintenance of an EPA, HHS, and DOE representative at the NRC Operations Center may continue to be helpful in providing information to the representative's Headquarters offices. Approval of information for distribution outside the NRC will be made by the DSO. The NRC staff will continue to perform assessments to support the site team.

RESPONSE TO CHEMICAL HAZARDS

1. In the event of a chemical release from an NRC licensed facility with potential offsite consequences, the NRC may request EPA and other Federal agency assistance in hazard evaluation and/or protective action recommendations. When notified of a chemical (non-radiological) release, the NRC will notify Federal agencies in accordance with these procedures and request EPA to provide the proper expertise to the Headquarters Operations Center/Site Team.

2. EPA will immediately provide one or more representatives with the necessary expertise to the appropriate location.



SECTION F
TELECOMMUNICATIONS DURING A RADIOLOGICAL ACCIDENT

SECTION F
TELECOMMUNICATIONS DURING A RADIOLOGICAL ACCIDENT

Page

TELECOMMUNICATIONS DURING A RADIOLOGICAL ACCIDENT

I. INTRODUCTION

A. Purpose

The purpose of this section is to describe the telecommunications support to Federal, State, and local response in the event of a radiological accident.

B. Scope

This section defines the telecommunications responsibilities for the participating agencies. The section describes coordination among organizations and the telecommunications required at the locations involved.

C. Concept

The concept of an interagency response is to integrate communications among the involved locations. The integration of the required communications will provide multiple telecommunications media for maintaining communications throughout the accident. Although each organization has responsibility for supporting the required telecommunications for the primary location for which it provides services, this section extends integrated telecommunications to each location.

II. RESPONSIBILITIES

A. In general, each organization is responsible to provide communications for the response locations it is supporting. However, it is also being tasked to provide a means for communicating with other locations as defined in this communications plan.

B. The organizations identified below will provide the primary communications to the location(s) specified:

U.S. Department of Energy (DOE):

Provide voice, data, and radio support to and from the Federal Radiological Monitoring and Assessment Center (FRMAC). Also, provide communications support to DOE Headquarters as required.

Federal Emergency Management Agency (FEMA):

Provide voice, data, and radio support to and from the Disaster Field Office (DFO). Also, provide communications support to FEMA Headquarters as required.

National Communications System (NCS)

Coordinate telecommunications support requirements between the government and telecommunications industry representatives. The NCS will provide continuous monitoring of the telecommunications infrastructure at the National Coordinating Center for Telecommunications.

U.S. Nuclear Regulatory Commission (NRC):

Provide voice and data communications to and from the Nuclear Power Plant (NPP) or accident site, the Emergency Operations Facility (EOF), the NRC regional office, and Headquarters Operations Center. If necessary, the NRC will provide radio and/or portable satellite communication support for the accident by means of the National Interagency Fire Center (NIFC).

State:

Provide voice and data communications to and from the State Emergency Operations Center.

Utility:

Provide voice communications to and from the NPP or accident site and EOF in support of the communications requirements of the NRC and State. Also, provide the communications lines for the Joint Information Center (JIC).

National Interagency Fire Center (NIFC):

As requested by the NRC, provide microwave and radio support as required in support of the mission of the NRC.

III. SUPPORT REQUIREMENTS

A. Each organization will provide equipment and connectivity to its primary area of responsibility as identified below. Also, organizations may be asked to provide connectivity to other locations as a means of providing alternate communications.

U.S. Department of Energy (DOE):

Provide telephone communications to the FRMAC by means of mobile PBX equipment, as well as telephone instruments associated with the PBX. Provide radio network and radios for field personnel in accordance with the mission of the FRMAC. If feasible, provide radio equipment for the buses. Establish and provide a communications link between the FRMAC and DFO. Provide a microwave link between the FRMAC and the EOF. Provide a communications link between the FRMAC and DOE for access to the long-distance telecommunications services.

Provide other communications capabilities as requested or required in support of the accident.

Federal Emergency Management Agency (FEMA):

Provide telephone communications to the DFO by means of mobile PBX equipment. Also, provide telephone instruments associated with the PBX. Provide telephones and extensions for the staff located at the DFO. Provide inbound access to the DFO PBX for the FRMAC. Provide a communications link from the DFO to FEMA for access to the FTS 2000 network. Provide outbound access to the FRMAC. Provide radio net and radios in support of the mission of the DFO. Provide other communications capabilities as requested or required in support of the accident.

National Communications System (NCS):

Coordinate emergency telecommunications support to all affected National Security/Emergency Preparedness (NS/EP) communication functions, including emergency services restoration priority.

U.S. Nuclear Regulatory Commission (NRC):

Provide telephone communications to the Control Room at the NPP, the Technical Support Center (TSC) at the NPP, and the EOF. Provide radio and/or portable satellite support from NIFC as required. Coordinate with the FRMAC and DFO on the installation and use of communications equipment and procedures. Provide audio conference capabilities from the NPP TSC and EOF, Regional office, and Technical Training Center (TTC) to NRC HQ.

State:

Provide telephone communications to the State EOC. Provide communications to the JIC. Provide telephone numbers for personnel at the State EOC to the FRMAC, DFO, and NPP EOF. Provide location and availability information to

DOE for positioning of microwave equipment to support the FRMAC and EOF. If possible, provide other communications capabilities as requested or required in support of the accident.

Utility:

Provide telecommunications support to the NPP and EOF as required. Coordinate the installation of telephone service to the JIC. Provide assistance in the installation of the microwave link between the FRMAC and the EOF.

IV. COMMUNICATIONS ARCHITECTURE PLAN

Objective: To provide a digital communications architecture that will allow for the dissemination of information from and between the FRMAC, DFO, and field subsidiaries via voice, data, and video transmission media.

General Guidelines:

1. Provisions must be made to accommodate the integration of analog to digital communications, where necessary.

2. The objective should be met while using the minimum amount of telecommunications equipment.

3. Individuals involved in implementing the architecture plan should be knowledgeable in voice, data, radio, and video transmissions and equipment.

Operational Requirements:

To attain the objective listed above, the minimum operational requirements listed below must be satisfied:

1. Voice communications

A. Sufficient channels of voice communications between the DFO and FRMAC for access to each respective telephone system. This will allow access to the long-distance telecommunications services from each facility and will allow interactive communications between the locations.

B. For each location, radio communications to each respective location from the field subsidiaries to monitor activities by field representatives. A frequency manager should be assigned for each location. Secure radio communications should be supplied by each respective organization.

2. Data communications

A. Data communications interactivity will be accomplished with the use of dedicated circuitry between the DFO and FRMAC. This dedicated circuitry will be used for the exchanging of information between the facilities for dissemination of information.

B. Video conference transmission will be a part of the data communications packages. The video conferencing capability will allow for interactive exchange of real-time information as required or requested.

Equipment Requirements:

The following is a recommended list of the minimum of equipment needed at each location to meet the objective of this plan:

1. Voice communications

A. Telephone switching equipment to allow each user to place and receive telephone calls from his or her location.

B. Communications switching equipment to allow interactive use of the telephone switching equipment at the other participating locations. The minimum would be two T-1 communications links. Portable satellite units should be one piece of the communications switching equipment.

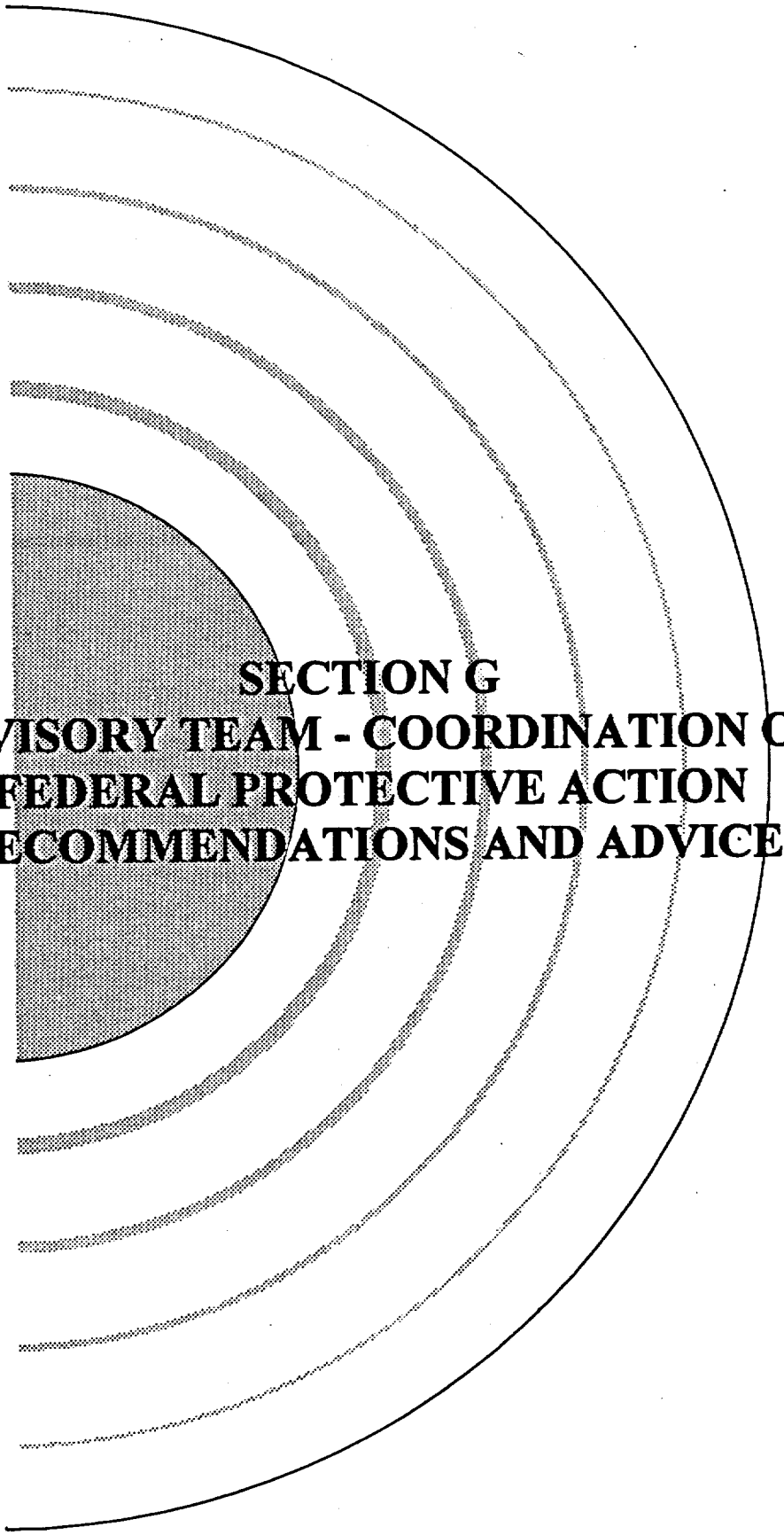
C. Sufficient numbers of radios and frequencies to communicate with field members in both normal and secure radio communications modes. A radio frequency manager is also required.

2. Data communications

A. Data terminals for use in processing information and for access to local area networks at each location.

B. Electronic mail capabilities at each location.

C. Video conferencing equipment at each location for initiating and receiving video conferences.



SECTION G
ADVISORY TEAM - COORDINATION OF FEDERAL PROTECTIVE ACTION RECOMMENDATIONS AND ADVICE

SECTION G
ADVISORY TEAM - COORDINATION OF FEDERAL PROTECTIVE ACTION RECOMMENDATIONS AND ADVICE

Page

Advisory Team: Coordination of Federal Protective Action Recommendations and Advice

Purpose

To describe the concept of operations by which the Federal agencies will develop coordinated protective action recommendations and advice to State and local governments when the NRC is the LFA.

Background

The Federal Radiological Emergency Response Plan (FRERP) describes the role of the LFA and other Federal agencies that may be involved in a coordinated Federal response to assist State and/or local governments affected by a peacetime radiological emergency.

The NRC is the LFA when there is a radiological emergency involving

- a nuclear facility licensed by the NRC or an Agreement State, or
- transportation of radioactive materials licensed by the NRC or an Agreement State.

The NRC as LFA will assist State and local authorities, if requested, by advising them on protective actions for the public[1]. The development or evaluation of protective action recommendations will be based upon the Protective Action Guides (PAGs) issued by USDA, EPA and HHS. In providing such advice, the NRC will use advice from other Federal agencies with technical expertise on those matters whenever possible. The NRC's responsibilities as LFA for the development, evaluation, and presentation of protective action recommendations are to:

(1) Respond to requests from State and local governments for technical information and assistance;

(2) Consult with representatives from EPA, HHS, USDA, and other Federal agencies as needed to obtain advice on protective actions;

(3) Review all recommendations made by other Federal agencies exercising statutory authorities related to protective actions to ensure consistency;

(4) Prepare a coordinated Federal position on protective action recommendations whenever time permits; and

[1] Italicized text have been reproduced verbatim, directly from the Federal Radiological Emergency Response Plan(FRERP)

(5) Present the Federal assessment of protective action recommendations, in conjunction with FEMA and other Federal agencies when practical, to State or other offsite authorities.[2]

"Protective actions" are those actions recommended and implemented by appropriate State and/or local authorities to be taken by the public to avoid or reduce the public's exposure to radiation. State and/or local officials have the responsibility to determine and implement protective actions. To help them make their decision, the States and/or local officials may request additional information from the licensee, if applicable, and advice from the NRC as LFA.

Federal protective action recommendations provide advice to State and local governments on measures that they should take to avoid or reduce exposure of the public to radiation from a release of radioactive material. This includes advice on emergency actions such as sheltering, evacuation, and prophylactic use of stable iodine. It also includes longer term measures to avoid or minimize exposure to residual radiation or exposure through the ingestion pathway such as restriction of food, temporary relocation, and permanent resettlement.

In a reactor accident, the NRC requires the licensee to make a timely, accurate protective action recommendation (PAR) to the State and/or local officials for consideration. The licensee bases the PAR on plant conditions and radiological conditions.

As LFA, the NRC will present the Federal assessment of protective action recommendations to State, local, and/or other offsite officials. This Federal assessment will include advice on environment, food, and health matters provided by the Advisory Team on Environment, Food and Health.

The Role of the Advisory Team on Environment, Food, and Health

The Advisory Team for Environment, Food, and Health is an interagency team, consisting of representatives from EPA, HHS, USDA, and representatives from other Federal agencies as necessary, that provides advice to the LFA and States, as requested on matters associated with environment, food, and health issues during a radiological emergency.

Advice on environment, food, and health matters will be provided to the LFA through the Advisory Team for Environment, Food, and Health (Advisory Team) consisting of representatives of EPA, HHS, and USDA supported by other Federal agencies, as warranted by the circumstances of the emergency. The Advisory Team provides direct support to the LFA and has no independent authority. The Advisory Team will not release information or make recommendations to the public unless authorized to do so by the LFA. The Advisory

[2] Italicized passages have been reproduced verbatim, directly from the Federal Radiological Emergency Response Plan.

Team will select a chair for the Team. The Advisory Team will normally collocate with the FRMAC. For emergencies with potential for causing widespread radiological contamination where no onscene FRMAC is established, the functions of the Advisory Team may be accomplished in the LFA response facility in Washington, DC.

The primary role of the Advisory Team is to provide a mechanism for timely, interagency coordination of advice to the LFA, States, and other Federal agencies concerning matters related to the following areas:

(1) Environmental assessments (field monitoring) required for developing recommendations;

(2) PAGs and their application to the emergency;

(3) Protective action recommendations using data and assessment from the FRMAC;

(4) Protective actions to prevent or minimize contamination of milk, food, and water to prevent or minimize exposure through ingestion;

(5) Recommendations regarding the disposition of contaminated livestock and poultry;

(6) Recommendations for minimizing losses of agricultural resources from radiation effects;

(7) Availability of food, animal feed, and water supply inspection programs to assure wholesomeness;

(8) Relocation, reentry, and other radiation protection measures prior to recovery;

(9) Recommendations for recovery, return, and cleanup issues;

(10) Health and safety advice or information for the public and for workers;

(11) Estimate effects of radioactive releases on human health and environment;

(12) Guidance on the use of radioprotective substances (e.g., thyroid blocking agents), including dosage and projected radiation doses that warrant the use of such drugs; and

(13) Other matters, as requested by the LFA.

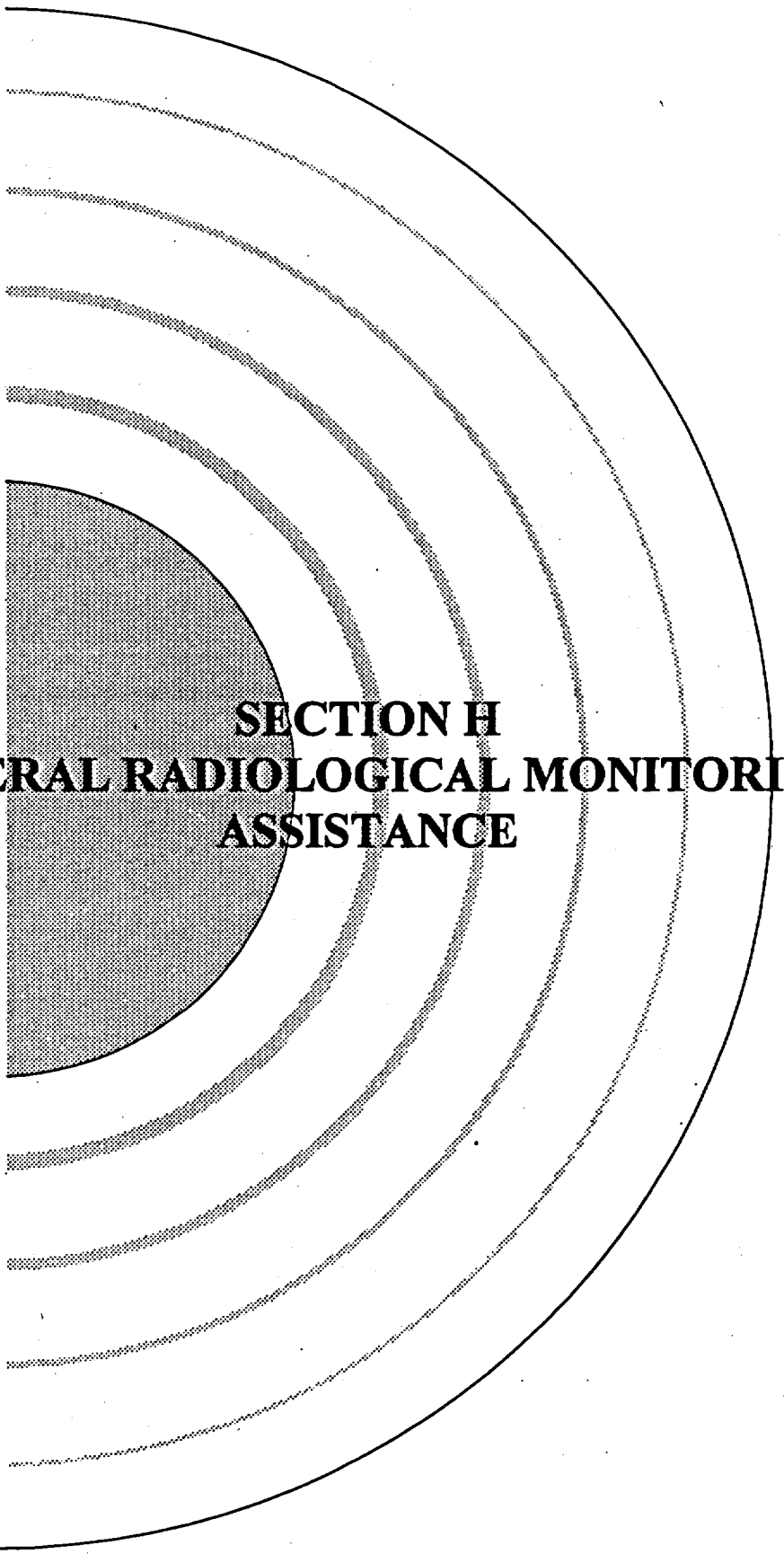
The Advisory Team--Concept of Operations

During early phases of the accident, the Advisory Team will be located in most instances at the NRC's Operations Center in Rockville, MD. In general, the Advisory Team will function ultimately from the scene and will work with the NRC to develop the Federal assessment of public protective actions to assist the State. The most likely near-scene location from which the Advisory Team will function is the Federal Radiological Monitoring and Assessment Center (FRMAC). Upon a decision to activate the FRMAC, the Advisory Team will begin preparations to depart to the scene. The personnel from the responding Federal agencies should be knowledgeable about their agency's protective action guidance and about radiological assessment methods. The Federal agencies involved in the response should be prepared to staff the response positions continuously with 24-hour coverage until the emergency has ended. The NRC will provide computer equipment and logistical support required by the Advisory Team.

Coordinated Federal Assessment

The Federal Radiological Monitoring and Assessment Center (FRMAC) is established by DOE (with subsequent transfer to EPA for intermediate and long-term actions) for the coordination of Federal radiological monitoring and assessment activities with that of State and local agencies. The FRMAC is established at an onscene location in coordination with State and local authorities and other Federal agencies. Among other organizations, the Advisory Team may be represented in the FRMAC.

The coordinated Federal assessment is based on the NRC's assessment of plant conditions and/or release of radiation and the Advisory Team's application of published Protective Action Guides (PAGs) to the radiological data provided initially by the licensee and later by the FRMAC. NOAA contributes the meteorological information required for the assessment but has no responsibility for assessment. The Advisory Team members provide an evaluation of the monitoring data and assessments in relation to their specific agency guidance for Federal protective action positions. Advisory Team members will also assist in determining the FRMAC assessment and monitoring requirements and priorities. The Federal assessment will then be presented to State and/or local officials by the NRC, in coordination with FEMA and other Federal agencies whenever practical.



SECTION H
FEDERAL RADIOLOGICAL MONITORING ASSISTANCE

SECTION H
FEDERAL RADIOLOGICAL MONITORING ASSISTANCE

FEDERAL RADIOLOGICAL MONITORING ASSISTANCE

Objective

The section explains how to obtain assistance in radiological monitoring from other Federal agencies.

Discussion

The U.S. Nuclear Regulatory Commission (NRC) is not qualified to conduct extensive radiological monitoring. Radiological monitoring assistance should be requested through the U.S. Department of Energy (DOE). DOE maintains radiological assistance teams and the capability to conduct aerial radiological monitoring. Under the Federal Radiological Emergency Response Plan (FRERP), DOE coordinates offsite Federal radiological monitoring and can draw upon the resources of other Federal agencies. It may take hours to get Federal assistance, so request DOE help early. It is better to cancel a request than not to have help when it is needed.

Guidance

Step 1

Determine whether the State has requested radiological assistance from DOE.

- If not, determine whether the NRC should request assistance. If the State has not requested DOE assistance, the NRC should request DOE monitoring if required to assure public safety. The request should be made in coordination with the State.

- If the State has requested assistance, determine whether additional Federal assistance should be requested.

Step 2

Determine the assistance or additional assistance required; more than one DOE monitoring capability may be needed.

- **Radiological Assistance Program (RAP)**—Prompt and limited monitoring with limited assessment of results.

- **Federal Radiological Monitoring and Assessment Center (FRMAC)**—More extensive monitoring and assessment capabilities involving the resources of several Federal agencies.

- **Aerial Measuring System (AMS)**—Prompt airborne monitoring.

Step 3

Complete the "Emergency Information on Facility Events for DOE" form for fixed facility events or "Emergency Information on Lost/Stolen Source Events for DOE" form for non-facility events.

Step 4

Request assistance as follows:

RAP	Call the appropriate DOE Regional Coordination Office. After calling DOE, call the NRC Operations Center [(301) 816-5100] and inform the Federal Liaison or a Response Coordination Team (RCT) member of your request.
FRMAC or AMS	Call the NRC Operations Center [(301) 816-5100]. Give your request and the information gathered in Step 3 to the Federal liaison or a Response Coordination Team (RCT) member. The Federal liaison or a Response Coordination Team (RCT) member should call the DOE Emergency Operations Center [(202) 586-8100] and coordinate the request. Provide a call-back number because the FRMAC Director or AMS representative will call the NRC Operations Center for further information within 1 hour of being notified.

Remind DOE responders to contact the NRC Site Team or NRC Federal liaison at the NRC Operations Center once they arrive in the vicinity of the accident and *before* proceeding to the site, to obtain a briefing on the radiological conditions.

Step 5

Notify the affected State(s) of the specific radiological assistance requested.

Description of DOE Radiological Monitoring Capabilities

Radiological Assistance Program

Eight DOE Regional Coordinating Offices for Radiological Assistance provide radiological assistance on request in any region of the country. The radiological assistance teams are the front lines of Federal assistance under the FRERP. RAP teams will generally be requested quite early in an event by the State and/or the NRC. RAP teams typically are composed of four to six people. Team personnel are capable of conducting gross gamma, alpha, and beta monitoring. They will require only ½-hour to 2 hours to prepare for a response; response time will depend on travel time to the location of the accident. The RAP team will also act as an advance team for coordination of further DOE assistance (FRMAC or AMS).

Figure H-1 shows the DOE radiological assistance regions and geographical areas of responsibility. Table H-1 contains the addresses and telephone numbers of the Regional Coordinating Offices for Radiological Assistance. RAP teams can be requested directly through these offices.

Federal Radiological Monitoring and Assessment Center

From the FRMAC, DOE coordinates the monitoring and assessment efforts of all Federal agencies. The FRMAC is usually established near the site of the accident. The size and complexity of the FRMAC will depend on the incident. The FRMAC can provide the most extensive monitoring and assessment capabilities available in the United States. It will require about 24 hours for a fully operational FRMAC to be established. DOE has delegated the responsibility for establishing the FRMAC to the DOE Nevada Operations Office. The U.S. Environmental Protection Agency (EPA) later assumes long-term coordination of the FRMAC, including planning for the long-term environmental monitoring program. EPA and DOE contractors provide monitoring, laboratories, and support for the FRMAC.

Aerial Measuring System

The AMS is an airborne radiological detection system that can perform plume tracking, radiation surveys, and radiation mapping over large areas around the site of an incident. AMS is operated for DOE by a contractor. Most of the aerial monitoring equipment is located in Las Vegas, NV, but there are also some capabilities based at Andrews Air Force Base, near Washington, DC. The AMS will be integrated into the FRMAC once it is established.

The AMS is equipped with real-time transportable analysis capability. It also has Global Positioning System capability that, used in conjunction with the NRC Geographic Information System (GIS), can produce radiation isopleths of the affected area for use by decisionmakers and field teams.

Fig. H-1. DOE radiological assistance regions and geographical areas of responsibility

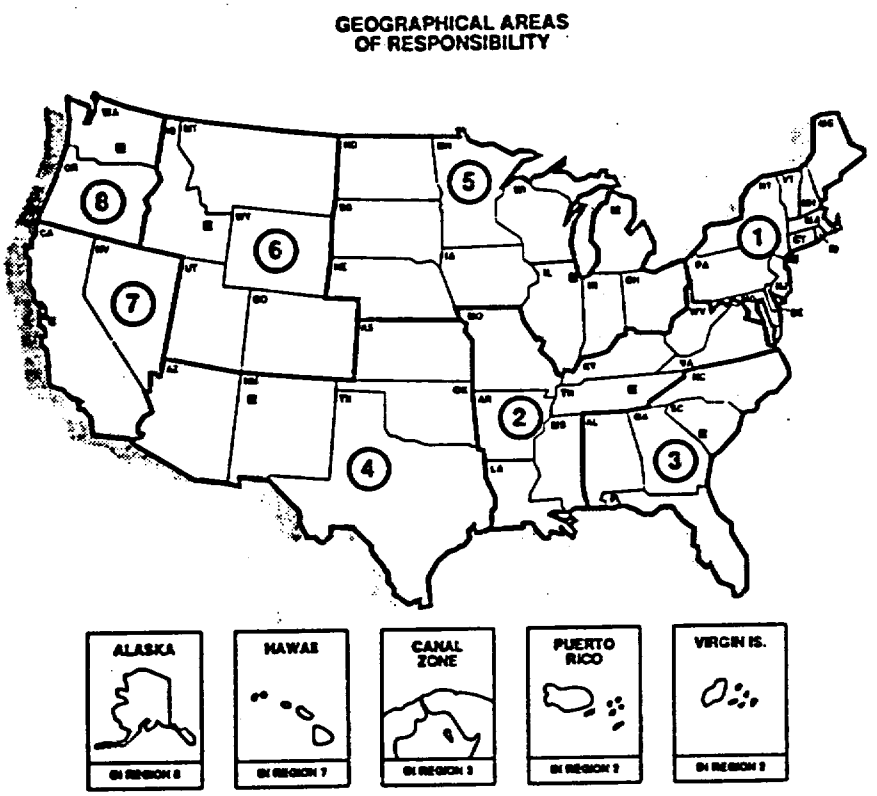


Table H-1. DOE Regional Coordinating Offices for Radiological Assistance

Region	Regional Coordinating Office	Address	Telephone for assistance
1	Brookhaven Area Office	RAP Program Manager S&EP Division, Bldg. 535A Brookhaven National Laboratory Upton, NY 11973	(516) 282-2200
2	Oak Ridge Operations Office	RAP Program Manager U.S. Department of Energy P.O. Box 2001 Oak Ridge, TN 37831	(423) 576-1005 or (423) 525-7885
3	Savannah River Operations Office	RAP Program Manager U.S. Department of Energy P.O. Box 616 Aiken, SC 29808	(803) 725-3333
4	Albuquerque Operations Office	RAP Program Manager U.S. Department of Energy P.O. Box 5400 Albuquerque, NM 87185	(505) 845-4667
5	Chicago Operations Office	RAP Program Manager E&SH Division U.S. Department of Energy 9800 S. Cass Ave. Argonne, IL 60439	Duty Hours: (708) 252-4800 Off Hours: (708) 252-5731
6	Idaho Operations Office	RAP Program Manager U.S. Department of Energy 785 DOE Place Idaho Falls, ID 83402	(208) 526-1515
7	Oakland Operations Office	RAP Program Manager U.S. Department of Energy 1301 Clay St. Oakland, CA 94612	(510) 637-1794
8	Richland Operations Office	RAP Program Manager U.S. Department of Energy P.O. Box 550 Richland, WA 99352	(509) 373-3800

EMERGENCY INFORMATION ON FACILITY EVENTS FOR DOE

1. General Information

Name of Facility	Location	Time of Call

2. Federal Agencies Notified by NRC

Agency		Time	Name of Radiological Contact	Phone Number
EPA				
USDA				
HHS				
FEMA				
Other				

3. State Agencies Notified by NRC

State	Agency or Department	Time	Name of Contact	Phone Number

4. Potential Airport(s) for DOE Personnel Deployed to Vicinity

Airport Name _____ Location _____
Name of Contact _____ _____
Phone Number _____ _____

5. Weather at Site

General Description _____
Precipitation _____ Wind Speed _____
Temperature _____ Wind Direction _____

6. Plant/Accident Status

Emergency Class _____ Time _____

Release Characteristics or Potential _____
_____
_____

EMERGENCY INFORMATION ON FACILITY EVENTS FOR DOE (continued)

7. Location of Emergency Operating Facility or Response Coordination Point

_____

_____

Name of Licensee Contact _____
Phone Number _____

8. NRC Site Team

Name of Contact in Vicinity of Accident (e.g., Monitoring and Analysis Coordinator)

_____

Location _____
Phone Number _____

9. Deployment Schedule

NRC
Arrival Time of NRC Site Team at EOF or Response Coordination Point _____
Arrival Time of NRC FRMAC Team to FRMAC
Staff _____ TLD _____ Van _____

State
Staff Arrival Time _____
Monitoring Team(s) Arrival Time(s) _____

DOE
RAP Arrival Time _____
AMS Arrival Time _____
FRMAC Advance Party _____
Arrival Time _____
ARAC Response Time _____
FRMAC Arrival Time _____

10. NRC Caller Information

NRC Caller's Name _____
NRC Caller's Phone Number _____

EMERGENCY INFORMATION ON LOST/STOLEN SOURCE EVENTS FOR DOE

1. Time of Call _____

2. Degree of Urgency
   - ___ Immediate
   - ___ Tomorrow
   - ___ Next Week
   - ___ Other _____

3. Suspected Location of Loss/Theft

City and State _____

Description (i.e., rural, urban, drilling/excavation site; if highway or pipeline, identify route)

_____

_____

Can a map or sketch be provided? _____

4. Likelihood of Concealment _____

5. Provide the following details regarding the source material, if possible:

Radionuclide(s)	_____	Chemical Form	_____
Quantity	_____	Physical Form	_____
Shielding	_____	Packaging	_____

Is a duplicate source available for signature determination? _____

6. Contact Familiar with Source and Circumstances of Loss/Theft

Name	_____	Phone Number	_____
Agency	_____	Fax Number	_____

7. Principal to Contact upon Arrival

Name	_____	Phone Number	_____
Agency	_____	Fax Number	_____

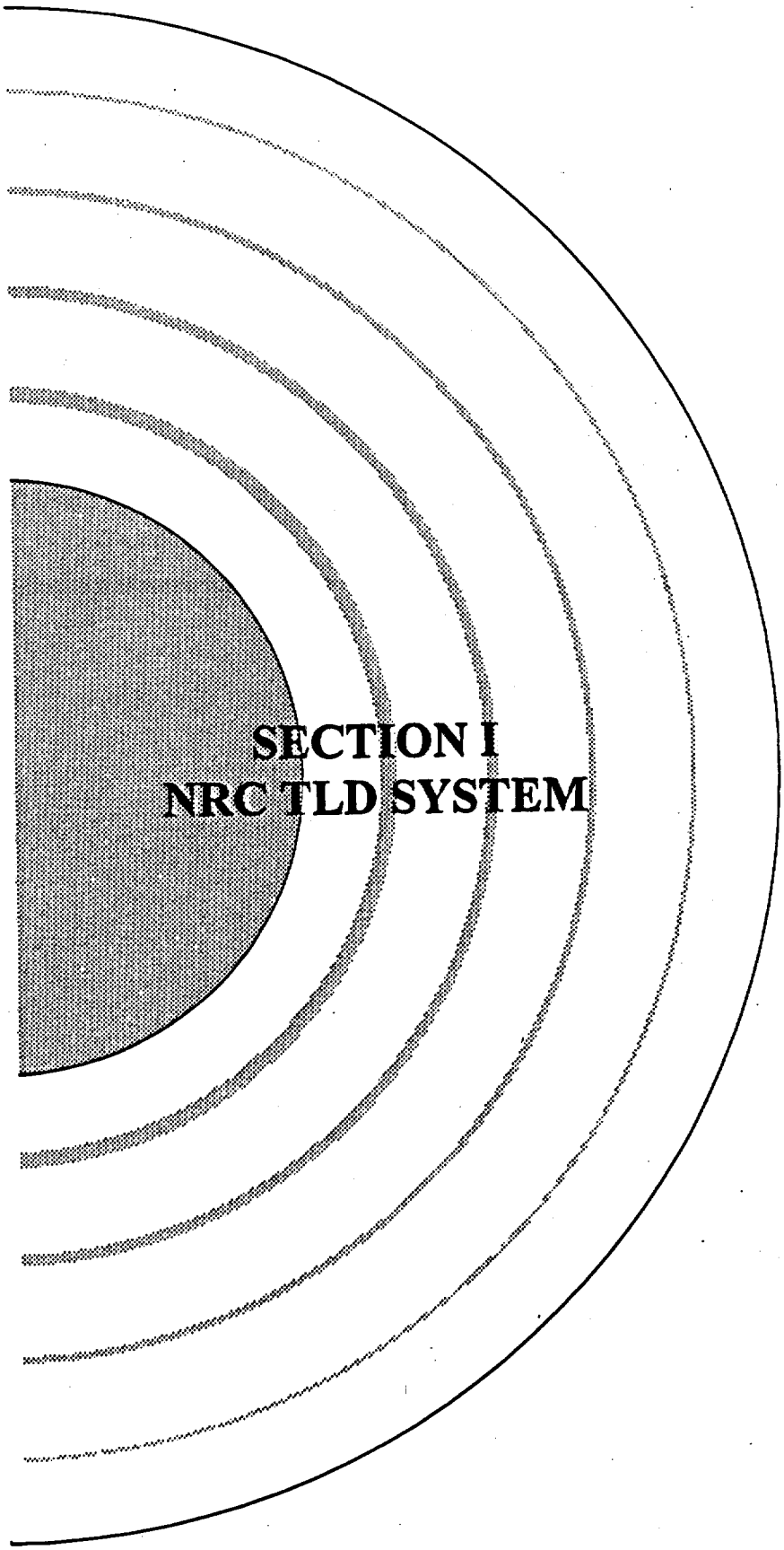
8. Efforts (to Date) to Recover

_____

_____

9. NRC Caller Information

NRC Caller's Name _____
NRC Caller's Phone Number _____



SECTION I
NRC TLD SYSTEM

SECTION I
NRC TLD SYSTEM

NRC TLD SYSTEM

I. ACTIVATION OF NRC TLD SUPPORT

Objective

The section explains the activation of and initial coordination with the U.S. Nuclear Regulatory Commission (NRC) Thermoluminescent Dosimeter (TLD) Direct Radiation Monitoring Network during a radiological emergency.

Guidance

NOTE: Region I maintains a network of TLDs around each commercial power reactor throughout the country. The Region I staff who maintain this capability can provide TLD support for any radiological emergency, including non-reactor emergencies in which TLDs may be effective in estimating offsite release over the course of the accident or supplemental personnel dosimetry.

CAUTION: NRC TLDs have not been qualified at present time under National Voluntary Laboratory Accreditation Program (NVLAP) of the National criteria for personnel dosimetry.

CAUTION: TLDs cannot be used in making protective action decisions.

Step 1

Consider activation of Region I TLD support if there is:

1. Potential for a release involving a risk to public health or involving considerable public concern.
2. Potential for a release during recovery from an accident (e.g., fission products in containment).
3. Site Area Emergency (SAE) or General Emergency (GE) at a reactor.
4. Need for supplemental personnel dosimetry.

Step 2

Contact the Region I Dosimetry Group.

1. **During normal hours:** Call Region I at (610) 337-5000 and ask for the Chief, Emergency Preparedness and Safeguards Branch or his or her supervisor.

2. **After hours:** call the NRC Headquarters Operations Center at (301) 816-5100 and ask for the Regional Duty Officer (RDO). Ask the RDO to place you in contact with Chief, Emergency Preparedness and Safeguards Branch, or his or her supervisor.

Step 3

Consult with Region I Chief, Emergency Preparedness and Safeguards Branch or his or her supervisor to discuss:

- Event location and status;
- Assistance required;
- Estimated time of arrival;
- Methods of coordination upon arrival at the site location;
- Location where Region I personnel can operate and avoid unnecessary exposure of annealed TLDs;
- Methods to advise Region I personnel on radiological conditions upon arrival in the general area of the accident;
- Points of contact and health physics support needs; and
- How to formally request assistance if the NRC response organization has not been activated.

Step 4

Formally request Region I TLD support during activation of the NRC response organization (A) or when the NRC response organization is not activated (B).

1. **When the NRC Response Organization is activated (Standby, Initial, or Expanded Activation),** call the Headquarters Operations Center (301) 816-5100 or (301) 951-0550 and make a request to the Executive Team.

2. When the NRC Response Organization is not activated, act as agreed upon in Step 3.

II. NRC TLD DIRECT RADIATION MONITORING NETWORK AND ITS USE DURING RADIOLOGICAL EMERGENCIES

Introduction and Purpose

The NRC TLD Direct Radiation Monitoring Network is a resource that can be used during and following a radiological emergency. The particular uses of the Network depend on the timing and duration of any releases and the response time of the NRC Dosimetry Group (Region I) to the incident site. The Dosimetry Group is composed of personnel who are knowledgeable about the NRC TLD Network and system.

The overall purpose of the NRC TLD Network and any augmentation of it during a radiological emergency is to provide a geographical profile of radiological exposures or incremental exposures around a site, should significant radiological releases occur. In addition, the NRC TLD Network will be useful in confirming the licensee's initial and periodic dose assessments. Such confirmations will be important, since the public's confidence in the licensee's measurements is likely to degrade in the event of an emergency.

The following sections discuss particular uses of the Network depending on the time at which Region I can respond and the phase of emergency releases at that time.

A. Uses of the NRC TLD Direct Radiation Monitoring Network During Emergencies

1. Arrival of Region I Dosimetry Group prior to the release or prior to anticipated significant additional releases.

Many of the analyzed accidents, including those categorized as severe accidents, result in releases that start hours or days following accident initiation, if significant releases occur at all. In such cases, the Region I Dosimetry Group could augment the routine network TLDs around the affected reactor by adding TLDs at the existing and/or additional locations.

Any augmentation would be at the direction of the Protective Measures Coordinator of the affected Region's Incident Response Site Team or his or her designee. The purposes for augmentation may be several.

(a) The current Network TLDs may not afford an optimal spatial distribution for monitoring the accident situation. Additional TLDs may be desirable in other sectors, at closer or greater distances, or at nearby population centers or other areas of interest. Those TLDs would supplement the Network TLDs, and those of the licensee and State(s).

Note 1: See NRC Inspection Manual, Chapter 1420, Section 2, General Siting and Placement Criteria, for a description of the general TLD siting philosophy employed in establishing the NRC TLD Direct Radiation Monitoring Network locations.

Note 2: See NUREG-0837, NRC TLD Direct Radiation Monitoring Network, (any volume or number) for a brief description of the TLD siting around any specific site.

(b) Additional NRC TLDs may be desirable for purposes of providing additional quality of measurement checks on other TLDs in place (for example, those of the licensee, State(s), or other agencies). (Those devices may also be subject to changes in response due to changes of energy or exposure condition during an accident.) In this case, NRC TLDs could be colocated with those of the other entities and exchanged on compatible time schedules.

(c) The augmentation may be for purposes of providing supplemental measurements at the locations of the Network TLDs and at locations included in (a) and (b) above. With a duplicate set of dosimeters posted at these locations, measurements can be made at weekly intervals (or more frequently, if the releases are significant), without disturbing the in-place dosimetry.

NOTE The limitations of the TLD system must be recognized when deciding the frequency and intervals at which these supplemental dosimeters are exchanged. The UD 801 TLDs in use have a practical lower limit of detection of several mR of integrated exposure for short exposure times. (An exposure of 1 mR represents about 4 days of background radiation at most sites.) In addition, if releases are ongoing or periodic during the exposure interval, exposure to the TLDs in-transit during the exchange could mask the exposure at the posted field locations. This masking could occur even if the TLDs are shielded while in transit. Nevertheless, the supplemental TLDs could be used to assess upper limits to exposures at locations during the exposure intervals.

As a practical matter, the Protective Measures Team and NRC response management should be aware that the TLD system is a monitoring system that is not designed to be used in making protective action recommendations. Exposures received by the TLDs have already occurred and cannot be used to project future "dose savings" from radioactive plumes by taking protective actions. (TLD measurements subsequent to the first TLD exchange following plume exposure can provide an indication of relative ground deposition levels.) TLDs provide the profile (or incremental profiles) of radiological exposure over the geographical area.

2. Arrival of Region I Dosimetry Group at the site after all significant releases have occurred.

Arrival of the Dosimetry Group with additional dosimeters at the accident site following all anticipated significant releases should prompt the following actions from the Protective Measures Coordinator or designee. If the releases were contaminating, that is, iodines or particulates were released in quantities sufficient to result in detectable surface contamination, it would be greatly desirable to exchange the Network TLDs expeditiously. A contaminating release would likely have contaminated the in-place TLD plastic holders

and to a lesser extent the weatherproof protective pouch containing the NRC dosimetry. Because of the close proximity of these contaminated surfaces to the dosimetry, this contamination may affect the TLD measurements to a much greater extent than would contamination on the ground. Estimates will be made of the factors and uncertainties affecting the TLD measurements.

If the release has not been contaminating, the Protective Measures Coordinator should still consider exchanging the Network TLDs as soon as practicable following all likely significant releases. This exchange is desirable to allow the development of the geographical exposure profiles while minimizing additional exposure to the TLDs from ambient background levels following plume passage.

The NRC TLDs should *not* be removed from the field without replacing them. The need for information from the TLDs should *not* outweigh the need for maintaining continuous monitoring capability. This concern is to maintain either the original TLDs or their replacements at each location throughout the entire interval of interest following an accident, assuring that no monitoring gap has occurred. Any such gap in monitoring would leave open the possibility of, or suspicion of, releases or exposures during the unmonitored interval.

The geographical exposure profiles will be utilized by the NRC, Federal Radiological Monitoring and Assessment Center (FRMAC), and/or other groups in assessing estimated total population exposures, using information available on protective actions taken and the timing of such actions. The NRC TLDs should also be compared to colocated devices to correlate and expand the total number of measurements available for this assessment.

3. Use of NRC TLDs as supplemental personnel exposure monitoring devices

The configuration of the Panasonic UD 801 dosimeters with the two lithium borate elements and two calcium sulfate elements allows the use of these TLDs for supplementing the routine personnel monitoring devices. The 14 mg/cm^2 "open window" also enables an assessment to be made of "nonpenetrating" vs. "penetrating" exposure. The NRC TLDs have not been qualified at the present time under NVLAP criteria for personnel dosimetry. Nevertheless, these devices could be utilized to provide certain measurements that may assist in exposure control for NRC personnel. Several examples follow:

(a) The devices could be used as supplemental monitors for specific emergency missions. An individual assigned to cover plant activities involving a potential high radiation field could be given a TLD, along with routine dosimetry (assigned TLD or film badge) and pocket dosimeters. Upon completion of the assignment or shift, the NRC TLD could be read and could be used as an indicator to determine whether the exposure received warrants removal of the individual from further radiation work until the routine, assigned dosimetry badge is read. Conservative allowances could be made for use of the NRC TLD (for example, lower level of detection of 20 mR, uncertainty ±50%). The "open window" capability of the NRC TLD would also provide a better indication of significant beta exposure than would pocket chambers.

(b) The NRC TLDs could be used to provide relative exposures to various portions of an individual's body. For example, exposure to extremities (feet or hands, head). could be compared to that received at the location of the individual's routine, assigned monitoring device.

The NRC TLDs could be employed to indicate that an NRC employee did *not* exceed a given level of exposure while in an area unlikely to have high radiation levels, or while on site only for a short time. (Following the TMI-2 accident, these same TLDs were used for this purpose by the NRC for Headquarters individuals on site for short times.) The NRC TLD provides some assurance that the individual did not exceed exposure levels based on conservative assumptions (See para. 3.(a) above).

B. Relationship between the Region I Dosimetry Group and the NRC Incident Response Site Team

The detailed description of the Dosimetry Group and Site Team interaction is described in the Protective Measures Team Procedures PMT-413 and PMT-414. In brief, the technical lead for operating the TLD system, determining the response of the system, evaluating the calibration, limitations and uncertainties of the system, following up with post-accident assessments of the system, and so forth, resides with the Region I Dosimetry Specialist and the Region I Chief, Emergency Preparedness and Safeguards Branch. The emergency response use of the TLD system, augmentation of existing Network TLDs, personnel monitoring use, timing and frequency of TLD exchanges, and so on, is under the direction of the Site Team's Protective Measures Coordinator or designee. It is expected that close coordination between these lead individuals will ensure the availability of technically valid data on a time scale that is commensurate with incident response needs.

In application, the Dosimetry Specialist and his or her management will decide whether it is advisable to ship the manual reader to the incident site. The Region I Dosimetry Specialist can be expected to accompany the reader (if sent), and the annealed augmentation TLDs to the incident site. (If the manual reader is not brought to the incident site, the Dosimetry Specialist will remain in Region I with the automatic reader and equipment and prepare TLDs for the site, read exposed TLDs, interpret measurements, and report them to the Protective Measures Team.) The Region I Dosimetry Group will also bring site maps, if available, showing the locations of the Network TLDs and the current driving routes for TLD exchange. At the site, the Dosimetry Team and a health physicist (generally also from Region I) will perform the dosimetry exchange as directed by the Protective Measures Coordinator or designee. The health physicist is expected to make exposure and contamination measurements at each location (as directed) and to monitor the radiation levels necessary for the protection of the TLD exchange team in the event of a significant release. Other Region I personnel will assure that the TLDs are transported to Region I for analysis or are read near site with the manual reader. The Dosimetry Specialist and his or her management will ensure that all appropriate reports are promptly prepared and disseminated with uncertainties and limitations clearly stated. The Protective Measures Coordinator or

designee may provide technical input to the Dosimetry Specialist and suggest other report formats or evaluations to better serve the NRC in the incident response.

C. Calibration Activities

Following exposure of the NRC TLDs (from the Network, augmentation, or personnel use) arrangements should be made by the Dosimetry Group with the National Institute of Standards and Technology (NIST) (formerly NBS) or agency with similar capability to expose a representative sample of the NRC TLDs to the spectra of nuclides and exposure configurations encountered during the accident. In this way the TLDs can be calibrated, after the field exposures, to the same or approximately same energies and conditions. The field values can then be adjusted to better reflect the actual exposures and corresponding uncertainties measured during the accident. These activities serve to narrow the assumptions about the dosimetry response characteristics discussed in paragraph A.3 of this document. (It should be noted that representative samples of all types of TLDs and instrumentation used during the emergency should be similarly evaluated).

Other corrections should be made to the NRC TLD data, including the following: normal ambient background exposure during the time the Direct Radiation Monitoring Network TLDs were in the field should be estimated (based on past TLD measurements at those locations) and subtracted.

NOTE: For non-network locations, estimates of backgrounds can be based on licensee or State measurements, if the relative responses between the NRC and licensee or State TLDs have been determined; or based on comparisons with the Bechtel Aerial Measuring Systems (AMS) preoperational overflight data. In-transit exposure based on the network control TLDs should be estimated and subtracted. In-transit exposure during the exchange following the accident should be estimated (based on appropriate controls) and subtracted. If contamination of the TLDs occurred in the field, estimates of the contribution of near-proximity contamination to that of the plume exposure should be made based on a measure of contamination levels, time of exposure, and correlation of contamination levels to exposure rates to the TLD.

TLDs placed in the field following a contaminating release may require correlation between TLD-measured exposure levels and ground contamination levels. It should be noted that the energy changes in the gamma spectrum following deposition may require additional energy calibrations at NIST or the calibration facility. The Dosimetry Group should work closely with the FRMAC in these activities.

D. Technical Background

The NRC TLD Direct Radiation Monitoring Network is employed by the NRC to routinely measure the radiation doses at selected locations around all licensed NRC power reactor facilities and a number of other sites. The monitoring period over which the doses are accumulated is normally a calendar quarter, but this may be shortened if conditions warrant

it. Such conditions include unexpected releases of radioactive materials from the reactor, such as during an accident. The program is conducted for the NRC by the Dosimetry Specialist Emergency Preparedness and Safeguards Branch, Division of Reactor Safety, Region I. NRC uses participating States and contractor personnel to physically exchange the dosimeters in the field.

The NRC TLD Direct Radiation Monitoring Network utilizes a Panasonic Model UD 710A automatic reader and Model UD 801 4-element thermoluminescent dosimeters (TLDs). The NRC also has a Panasonic Model UD 702E manual TLD reader, which can be transported to remote locations and set up to anneal and read TLDs at locations near the site of interest. Both the automatic reader and manual reader can be connected to a microcomputer, to collect, analyze, and store the data and perform desired calculations. The automatic reader is routinely used to anneal and read all of the field TLDs (3000 to 4000) on a quarterly basis. The manual reader is not routinely used in the NRC TLD Direct Radiation Monitoring Network, but is periodically checked to assure it will operate properly, if needed.

The UD 801 TLDs have two lithium borate ($Li_2B_4O_7$:Cu) and two calcium sulfate ($CaSO_4$:Tm) elements. The lithium borate elements have a flat, near-tissue-equivalent photon energy response. The calcium sulfate, while much more sensitive than the lithium borate, is much more photon energy dependent at photon energies below 100 keV. To reduce this energy dependence, lead filters are used to cover the calcium sulfate elements. The total filtration over the calcium sulfate elements is 1,000 mg/cm^2. One lithium borate element has an "open window" (14 mg/cm^2) and the second is covered by 160 mg/cm^2 plastic filters.

For routine environmental monitoring, all four elements of each dosimeter are read. Each element has its own calibration factor, which is used in computing the dose measured by the dosimeter. Because the $CaSO_4$:Tm elements are much more sensitive to photon radiation than the lithium borate elements and show little residual readout after annealing, the $CaSO_4$:Tm elements are more precise for routine environmental measurements. Current NRC practice is to use only these two elements in computing the quarterly exposures for each field TLD location.

The lithium borate elements, while less sensitive and having a larger residual reading following annealing, are much less energy dependent. The NRC routinely reviews the level of the $CaSO_4$:Tm measured exposure and the ratio of the $CaSO_4$:Tm to $Li_2B_4O_7$:Cu measurements to ascertain any shifts in this ratio from that routinely seen in the environment. Any ratio shifts result in investigations of anomalous releases or unusual exposures of the TLD. (The ratio changes with photon energies below 100 keV and with direction of incidence of the radiation on the TLD. In addition, the compensation of the filters for perpendicularly incident photons does not result in a response curve, which is completely independent for all photon energies.) If the approximate energies of the exposure can be determined, then the dosimeters can be calibrated for these energies after the readout and the measured exposures can be appropriately adjusted. (Ref. NUREG-0837: NUREG/CR-3775)

III. REGION I DOSIMETRY GROUP'S USE OF NRC TLD DIRECT RADIATION MONITORING NETWORK DURING A RADIOLOGICAL EMERGENCY

Purpose

The purpose of this procedure is to describe the mechanism for activating the NRC TLD Direct Radiation Monitoring Network (TLD Program) during a radiological emergency, assign specific responsibilities for implementing and coordinating its use during an emergency, and provide considerations and actions for implementation for Region I personnel.

References

PMT-413 Activation of NRC TLD Support

PMT-415 Site Team Health Physicist Support to Region I Dosimetry Group

Region I DRSS Instruction 0860.5 "NRC TLD Direct Radiation Monitoring Program Manual," Part VIII - Emergency Response

Actions

Activation. In the event of a radiological emergency and if the emergency situation appears to warrant activation of the TLD program, the Protective Measures Manager/Coordinator (PMM/PMC) of the NRC Response Team should contact the Region I Dosimetry Specialist and his or her supervisor, Chief, Emergency Preparedness and Safeguards Branch, (if available). The specific topics of discussion should include the status of the event; whether releases have occurred or are likely to occur; the intended purpose of TLD augmentation (e.g., exchange of the network TLDs, monitoring additional locations, posting additional TLDs at current network locations, supplementing personnel monitoring devices); the estimated time of arrival, specific site destination and contact point; the personnel and equipment responding; and support needs for the Dosimetry Group at the site. The Dosimetry Group consists of the Dosimetry Specialist and supervisor, and one or more assistants (other individuals knowledgeable of the NRC TLD program). The Dosimetry Specialist would likely remain with the manual reader, if used, or in Region I if the manual reader is not taken to the site. Other Region I personnel will assist in preparing to respond to the site and will respond with the equipment.

NOTE: The PMM/PMC has responsibility for determining what TLD augmentation will occur and on what schedule. The Region I Dosimetry Group is responsible for the technical aspects of the implementation and will advise the PMM/PMC in technical areas and in data interpretation.

Preparation. After informing his or her management of the request for emergency dosimetry, the Dosimetry Specialist should immediately prepare dosimetry and equipment for travel to the site vicinity. (See Region I DRSS Instruction 0860.5, Part VIII.)

NOTE: Dispatch to the site will not occur (other than at Region I) until officially requested by a member of the HQ Executive Team through Region I management.

The decision to take the manual TLD reader (Model UD 702E) to the site will be made by the Dosimetry Specialist and his or her management. This decision will be based, in part, on the ability to get freshly annealed TLDs to the site and return of exposed dosimeters to Region I on a timely basis. It is preferable to bring the exposed TLDs back to Region I and use the Model UD 710A automatic reader and associated computer equipment for all measurements. If, however, the situation is such that timely transport to and from the site is difficult, consideration should be given to moving the Model UD 702E manual reader to the site. In addition, if the TLDs are expected to be used in personnel monitoring, faster turnaround in terms of measurements may necessitate moving the manual reader to the site.

Materials and Equipment. The number of TLDs to be annealed and moved to the site will depend on their intended use as indicated by PMM/PMC. The number ranges from a replacement set of network TLDs for the site plus in-transit controls, to a full network replacement set for the site plus a second set for supplemental measurements, approximately 50 TLDs for additional environmental locations, 50 TLDs for personnel use, adequate control TLDs, and TLDs for standardizing the manual reader at the site. The Dosimetry Laboratory maintains 100 TLDs designated for emergency response, in addition to the second set of TLDs for each site (if the latter are not in transit to or from the site as part of the quarterly exchange process). After determining the intended use, the Dosimetry Group should anneal the appropriate number of TLDs and prepare them for shipment (with controls). (At this time it will not be necessary to bag and label each TLD, since the situation at the site may dictate other actions by the time the dosimetry reaches the site.)

The following additional equipment should be prepared as the situation dictates:

- The Manual Reader (Model UD 702E), computer, and associated software (if the decision is made to take reader to site);
- Supply of bags for sealing field TLDs;
- Bag sealers;
- Tags for field TLDs;
- Site map showing current locations of Network TLDs, if available;
- Site TLD driving routes for exchanging TLDs;
- NRC TLD measurement histories for site (NUREG-0837 data);
- AMS preoperational or operational overflight radiological reports/maps, if available;
- Uranium placque source for field calibrating manual reader at site;
- Tape (for sealing bags in the field);
- Shields (2) for reducing in-transit exposures during TLD exchanges;
- Booties (disposable);

- Latex gloves (box);
- TLD badge clips (if use is intended for personnel monitoring) and labels;
- Scissors;
- Smear papers/glassine envelopes; and
- Stapler w/staples.

The Dosimetry Laboratory has assembled an emergency kit containing the generic supplies and a listing of pertinent other equipment and supplies to be obtained at the time of an emergency.

Deployment to Site. Upon completion of the preparatory activities described above and when a request for TLD support is received from the Executive Team, the Dosimetry Group (including a Region I health physicist) should travel to the site area in an expedited manner.

The mode of travel and estimated arrival time should be provided to the NRC Protective Measures Team. Directions for contacting the NRC Site Team and location for a near-site TLD operating base should be obtained from NRC Protective Measures (typically through the responding Region's Base Team).

NOTE: If travel is by air, hand-carry the annealed TLDs. DO NOT HAVE TLDs X-RAYED AT AIRPORTS.

Arrival at the Near-Site Location. Upon arrival at the designated location, the Dosimetry Group should contact the PMC through the NRC Headquarters Operations Office (HOO) and arrange for a conference to discuss the specifics of the TLD operations intended for the site. Requests for support for the Dosimetry Group (communications, health physics support if not from Region I, and so forth) should be made to the PMC. Arrangements for retrieving the control TLD maintained by the State or TLD exchange contractors for the batch of NRC network TLDs currently in the field should be discussed. With the PMC or designee, the Dosimetry Group should determine where current network TLDs should be augmented. A map with locations of the current NRC TLD network, licensee, and State' s dosimetry indicated would be very useful. When directed by the PMC or designee, dosimetry group personnel will begin the augmentation or exchange process with assigned health physicist.

NOTE: Exchanges should *not* be done if significant releases are in progress. Discussions with the PMC or designee should include measures to be taken if releases should occur while the dosimetry team is in the field.

If the manual reader was brought to the site, the Dosimetry Specialist should set up and test the equipment. The Dosimetry Specialist will usually remain with the manual reader (or in Region I if the automatic reader is to be used) and will not be available for the field exchanges or augmentation of the Network TLDs. In addition, a series of calibration dosimeters should be exposed using the uranium placque source to ensure that the reader is operating properly. The calibration range should extend as high as or higher than the anticipated exposures from the field and personnel dosimeters. (Additional calibration

dosimeters should be read 24 hours after exposure with the field and personnel exposed TLDs. If the emergency situation demands that the dosimeters be read earlier than 24 hours, they should be read and the fade times recorded. The fade correction can be estimated later.)

Addition of New Field Monitoring Locations. Before leaving the TLD operations base, the Dosimetry Team and the PMC/designee should decide on the number and locations of each new monitoring location and mark these general locations on a map. The driving directions for optimum use of resources should be preplanned; dosimeters bagged with appropriate labels and placed in a shield in the vehicle; means for attaching new dosimeters (tape, stapler, extra bags, etc.) loaded; ladder or step stool loaded; and survey instruments (ionization chamber, pancake Geiger Mueller (GM) and microR meter) source checked and loaded. Just before departing to begin TLD exchange or augmentation, contact should be made with the PMC or designee to ascertain current plant conditions and the likelihood of near-term releases. If radio communications are available with the Site Team, they should be tested.

At each general location sited by map, a specific location (telephone pole, small tree) must be used. The TLDs should be located 8 to 10 feet above ground and placed so they are least conspicuous to passers-by to make the TLDs less susceptible to vandalism. Before selection of the specific site, a survey of the ambient radiation levels at waist height should be done of the general area (10- to 20-foot radius) with the microR meter to ensure that the selected site does not have an inherent radiation anomaly. The identification of the specific site must be recorded, along with the driving directions and map indication, ambient radiation levels, and the time of posting the TLD at the site. This process is repeated for each additional location.

NOTE: If given a warning that a release has occurred while in the field *and* the release will affect the area of the Dosimetry Team, or if the health physicist measures significant plume activity, the team should leave the area immediately. (Exposure to the plume will affect the in-transit dose to dosimeters in the vehicle. Such exposure should be minimized.) Inform the PMC or designee of your actions and await his or her instructions after clearing the plume area.

Exchange of TLDs. If directed to exchange field TLDs, prepare dosimeters as described above. Determine from the PMC or designee whether a contaminating release has occurred. If not, the exchange process is similar to the installation of new TLD locations discussed above, except that the retrieved TLDs should be stored in a shielded container in the vehicle (preferably a different one than that used for the annealed TLDs). Again, the measurement of the ambient radiation level at each location would be helpful and should be recorded. Proceed according to the existing driving route for exchange, unless directed to do otherwise.

If a contaminating release has occurred or was suspected, additional actions are required to prevent contamination of personnel, vehicle, and TLDs; to determine the extent of contamination of nearest surfaces to the TLD; to remove TLDs from the contaminated

environment as soon as practical; and to install annealed dosimetry in uncontaminated areas or cages.

At each location the area should be surveyed for contamination after donning protective booties and gloves; the existing cage top should be surveyed to determine measurable contamination; and the cage then smear tested and gross counted for contamination with the GM. If contamination is found, the bag containing the TLD in the cage should be assumed to be contaminated. Upon removal from the cage, the bag should be surveyed. The dosimetry bag should then be carefully cut and the dosimetry and tag put into a clean bag, which is taped shut and inserted into the shield for transit. The removed "contaminated" bag should be put in a larger bag and stored in the vehicle away from the TLDs. (One or more of the more highly contaminated bags should be stored separately for resurvey and definitive isotopic analysis upon return, so that an estimate of correlation between contamination level and exposure rate can be made. An annealed TLD inserted into this bag will also provide correlation information.) All survey and smear measurement results must be recorded with times associated with them.

If the TLD cages were contaminated, the annealed TLDs should *not* be put into the same cage, unless it has been decontaminated. New field support devices or means should be used to post the annealed TLDs. The above process is repeated at each TLD location.

Plant situation changes received by radio, if available, or as detected by the health physicist may require recontact with the PMC or designee to ascertain any changes in instructions during the TLD exchange.

Return to TLD Operations Base. Upon completion of the TLD exchange or augmentation route (or if directed by the PMC or designee while en route) return to the TLD operations base. The contaminated TLD bags and smear samples selected for analysis should be separated for this purpose. The remaining TLD bags, used gloves, booties, and other contaminated materials should be assembled and held for disposal. The health physicist should contact the PMC or designee to arrange for analysis of the smears and designated bags and for appropriate disposal of contaminated wastes. The assigned health physicist should assist in segregating and transporting of these materials. The Dosimetry Team should again survey the retrieved TLDs for possible contamination.

The dosimeters should then be stored in a shield with controls for reading after 24 hours (unless directed otherwise by the PMC because of perceived urgency of the data). If the manual reader was not brought to the site, hand carrying of the TLDs to Region I should be arranged and coordinated with the Site Team.

The TLDs should be read at Region I (or near site with the manual reader), after assuring that the reader is properly standardized.

Personnel Monitoring. If the PMC determines that the NRC TLDs are to be used to supplement personnel monitoring dosimetry, the Dosimetry Team will anneal the requested

numbers of TLDs, place them in badge clips for personnel monitoring, and affix appropriate identification labels on each badge. The badges will then be turned over to the PMC or designee for Site Team use. The PMC or designee is responsible for dosimetry issuance and personnel dosimetry records completion. Any unusual exposure configurations, radiation fields, or energy readings should be reported to the Dosimetry Team to better assist in measurement interpretation. Some factors may be estimated through post-exposure calibrations.

To the extent possible, the TLDs should be read after 24 hours following exposure.

Calibration of TLDs to Unusual Exposure Conditions. Releases of radioactive materials from nuclear plants as a result of an accident usually have photon and beta energy spectra that deviate from those normally measured in the environment. Consequently, monitoring devices such as TLDs and survey instruments may respond differently than during routine calibration.

For TLDs used in the NRC Network, the Dosimetry Specialist will arrange for a calibration of a sample of the UD 801 TLDs by NIST, the Radiological and Environmental Sciences Laboratory (RESL) at Idaho Falls, or other qualified entity, under exposure conditions simulating those experienced during the accident. The Headquarters Executive Team should be informed through the Protective Measures Team and Director of Site Operations of these calibration needs so that appropriate funding can be arranged. The requests could also be made through the Federal Response Center (FRC) if the Federal Radiological Emergency Response Plan (FRERP) has been implemented.

The Dosimetry Team, with assistance from the Protective Measures Team, needs to document the exposure conditions to the extent possible and to define the scope of the calibration effort desired from the calibration facility. Helpful information available through the Protective Measures Team and from field surveys and smears includes:

- Approximate nuclide mix of the release to which TLDs were exposed;
- Exposure configuration (such as overhead plume/immersion plume, nearby contamination on cages/TLD bags);
- Nuclide mix of contamination;
- Effect of ground contamination on TLD exposure; and
- Beta/gamma vs gamma exposure to TLDs.

Dose estimates using the calibration factors should be incorporated into the assessments made by the Federal Radiological Monitoring and Assessment Center (FRMAC) as part of the Federal (FRERP) response. The Dosimetry Team should work closely with the FRMAC in the data evaluation effort.

Reports. The Dosimetry Specialist should issue preliminary reports of the TLD measurements as soon as the TLD data become available. The reports should indicate the uncertainties and precautions to be used when using the report results (energy response

changes, exposure configurations, etc.) and should indicate the status of efforts to get more definitive assessments of the results. These reports will be provided to the PMC or designee and to the FRMAC.

Final TLD assessment information should come from the FRMAC, along with all other assessment information.

IV. SITE TEAM HEALTH PHYSICISTS SUPPORT TO REGION I DOSIMETRY GROUP

Purpose

The purpose of this procedure is to describe the responsibilities and management of the health physicist assigned to the Dosimetry Team for the exchange of or field augmentation of the NRC TLD Direct Radiation Monitoring Network.

References

PMT-413 Activation of NRC TLD Support

PMT-414 "Region I Dosimetry Group, Use of the NRC Direct Radiation Monitoring Network During a Radiological Emergency"

Equipment Needed

- Ionization Chamber (Eberline R0 2 or equivalent);
- Pancake type GM detector (shielded);
- MicroR meter; and
- Personnel dosimetry equipment for Dosimetry Team.

Actions

Management Chain. The health physicist is generally a Region I Radiation Specialist assigned to respond with the Dosimetry Group by Region I management. The health physicist (1) provides personnel radiological protection during the NRC TLD field augmentation or exchange process; (2) supports the Region I dosimetry assistant during the TLD exchange process by providing radiological survey and contamination control support; and (3) provides general assistance for the exchange process. For purposes of personnel radiological protection, the health physicist reports to the PMC or designee. The dosimetry assistant directs the health physicist in aspects of obtaining technically valid radiological measurements necessary to relate TLD measurements to exposure conditions.

Radiological safety concerns always take precedence over technical support priorities. Contamination control is the responsibility of all team members.

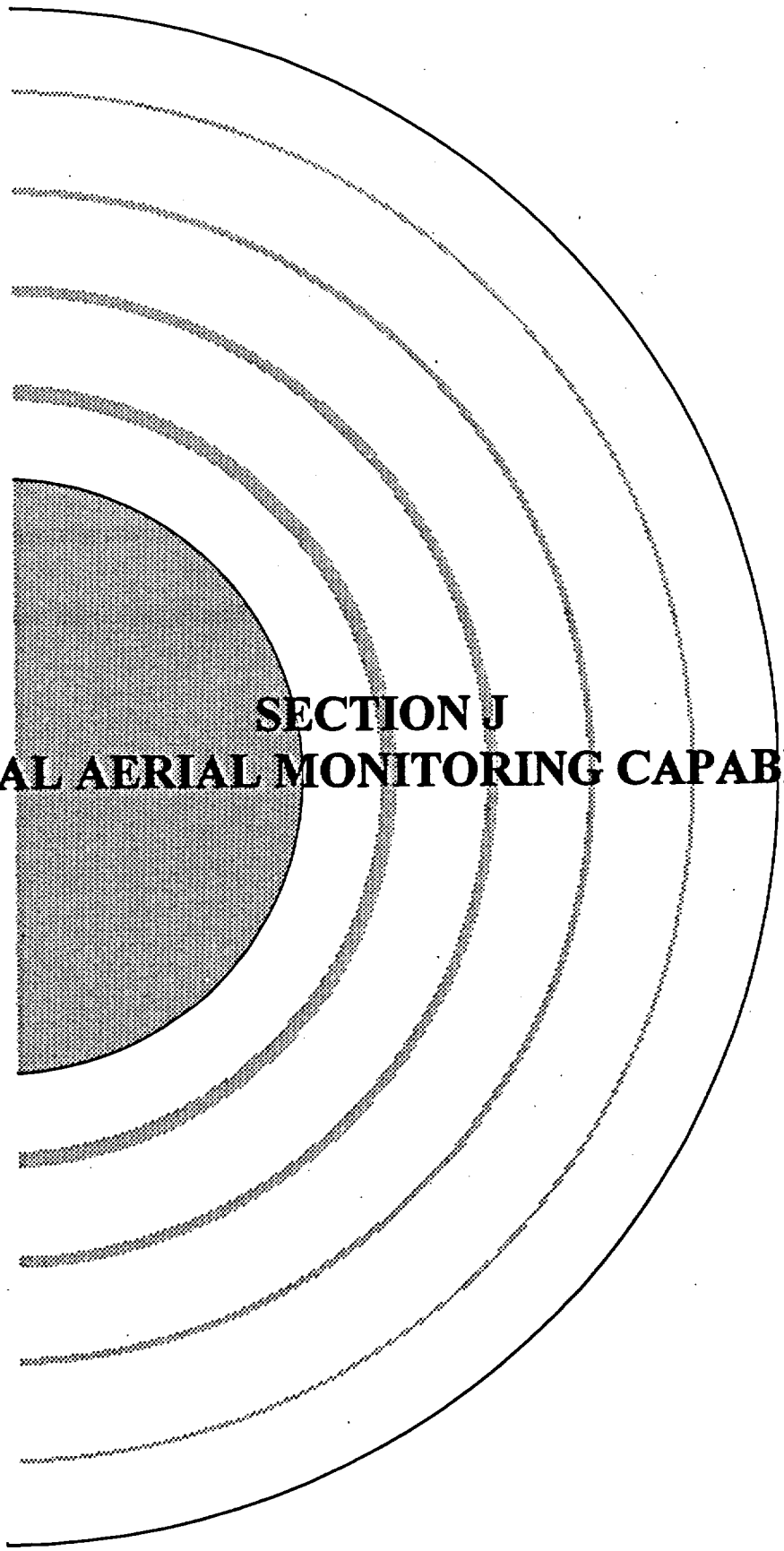
Field Augmentation or Exchange. During the field exchange or augmentation of NRC TLDs, the health physicist should assist the Region I dosimetry assistant in following the driving route or map. At each *new* location, the health physicist should perform a survey of the general area (about a 20-foot radius of the proposed specific location) at waist height with a microR meter to document the ambient radiation level and ensure that no local radiological anomaly exists. If a contaminating release had occurred, then a surface level survey (with HP-210 or equivalent detector) should be performed to document relative ground deposition levels. In addition, measurements of existing TLD cage contamination levels and TLD bag contamination levels should be made with the survey instrument *and* with a smear paper.

Proper contamination control measures must be used for personnel protection (gloves, booties, etc.), as well as to prevent contamination spread cross-contamination of the dosimetry. The detected presence of a radiological plume should warrant immediate contact with the PMC or designee and leaving the area, unless specifically directed otherwise by the PMC or designee.

Measurements should be clearly documented as to times, locations, and activity levels. Smears should be individually bagged after field measurement for later isotopic analyses, if warranted. An ionization chamber (R0 2, or equivalent) should be used to measure dose rates, if significant.

If dosimetry cages are found to be contaminated, the TLDs should be removed from the bags and carefully inserted individually with their location tags into clean bags and taped shut. They should then be put into a shield for transport back to the TLD operations base and stored until read or sent to NRC Region I. Contaminated bags and materials should be stored separately, as far from the TLDs as possible in the vehicle. A number of the contaminated bags should be segregated for later gamma spectral analyses for additional data that may assist in data interpretation. Contaminated cages may have to be removed from the current sites before installing freshly annealed TLDs. In some cases, other suitable TLD locations can be found in the same area.

Return to the Dosimetry Operations Area. Upon completion of the assignment and return to the dosimetry operations base, the health physicist should assist in unloading the exchanged TLDs and carefully surveying them for any residual contamination. Contaminated materials not needed for analysis should be disposed of in accordance with the instructions of the PMC or designee. The health physicist may then be released (following any necessary decontamination of the vehicle and equipment) for further assignments by the PMC or designee.



SECTION J
FEDERAL AERIAL MONITORING CAPABILITY

SECTION J
FEDERAL AERIAL MONITORING CAPABILITY

Federal Aerial Measurement Capability

Objective

This section provides the U.S. Department of Energy's (DOE) procedure to effectively utilize DOE's Aerial Measuring System (AMS) assets to 1) very quickly obtain a broad overview of the radiological problem and 2) construct comprehensive and exhaustive radiological maps.

Guidance

CAUTION: The monitoring priorities are:

- **1000 mR/hr (1R/hr) serpentine observations** or isopleths indicate the areas where early health effects may be possible.

- **10 mR/hr serpentine observations** or isopleths indicate where the U.S. Environmental Protection Agency (EPA) Plume Protective Action Guide (PAG) may be exceeded in 4 days (evacuation warranted). If the state does not use EPA PAGs, then use exposure rate equaling the state PAG in 100 hours.

- **1 mR/hr serpentine observations** or isopleths indicate the boundary of the area where the EPA Intermediate (relocation) PAG may be exceeded in the first year. 1 mR/hr is based on an assumed mix of fission products for a reactor core damage accident and should be revised based on the actual mix and state PAGs.

Step 1

DOE authorizes deployment of AMS aircraft.

Before deployment of AMS, DOE Headquarters (OEMT) must approve the release of the assets. This authorization is initiated by a request for assistance to DOE/HQ, DOE/NV or RAP.

Step 2

Coordinate with DOE and AMS.

Establish communications between DOE, AMS, the state, NRC and facility principals. Develop initial monitoring strategy, share plant and mission information and plan method to pass results as appropriate by the methods below:

- **Before AMS arrives on scene.** The DOE "Home Team" will be responsible for coordination and planning of the initial AMS mission until the aircraft arrives. The Home Team will contact the NRC Operations Center at (301) 816-5100 and ask for the Federal Liaison or Response Coordination Team. Expect the Home Team to

request telephone and fax numbers for the Protective Measures Team's 1) Dose Assessment Analyst, 2) Monitoring and Assessment Coordinator (MAC), 3) state radiological health principal, 4) NRC Site Team contact and 5) state representative on site. They will also ask for a briefing on plant and local conditions (using the Radiological Emergency Notification and Evaluation Form J-1). All information necessary to expedite the mission should be shared. Until the aircraft arrives on scene all contact with AMS should be channeled through the Home Team at (702) 295-1075 (FAX 295-8648).

- **In vicinity of accident.** The senior DOE official on the scene (typically with the RAP team) will contact local and state principals, plus the NRC Site Team (MAC). If the Site Team is unavailable, then contact will defer to the NRC Operations Center Federal Liaison. The senior DOE official will review both monitoring priorities and the information exchange protocol. Updates on plant status, releases and plume predictions will be requested. This information will then be passed to the AMS mission scientist upon arrival.

If a senior DOE official is not available, it will be necessary for the AMS scientist to obtain this same information either in person or through the Home Team. It is preferred that at least a state representative and the AMS scientist meet in person at the airport for this briefing.

Step 3

- **Deploy aircraft to site.** The DOE AMS assets consist of both specially equipped fixed-wing airplanes and helicopters. Presently, a B-200 airplane is pre-positioned at both Andrews Air Force Base, near Washington D.C., and Nellis Air Force Base in Las Vegas, Nevada. Similarly, two BO-105 helicopters are stationed at both locations. The fixed-wing aircraft are the initial responders to an emergency. The helicopter systems provide detailed follow-up measurements. A B-200 and one or more helicopters will be deployed to the incident. Table J-1 and Figures J-1 and J-2 specify enroute ferry times to commercial nuclear power plants.

- **Beechcraft B-200 Fixed-Wing Aircraft.** The B-200 fixed-wing aircraft are the initial emergency responders and will be the first major DOE assets to arrive on scene. Their primary mission is rapid deposition mapping, but they are also capable of plume tracking and airborne air sampling.

Prompt response of these long range, all-weather, IFR rated aircraft is assured by around-the-clock assignment of one aircraft with crew as the duty aircraft. The crew of the duty aircraft are predesignated and on 24 hour recall via pager. This duty alternates periodically between Nellis and Andrews AFB based aircraft. Departure of the initial B-200 can be expected within four hours of notification. A second B-200 may also be dispatched later, if available and sufficiently beneficial.

Transit times to the site will be the ferry time listed in Table J-1 or Figure J-1, plus a one hour fuel stop planned for every three hours of flight. Although, weather will generally not be a significant factor in ferrying the aircraft to the site, it may have a large role in determining the specifics of the data acquisition mission, e.g., altitude and pattern. Similarly, terrain (e.g., mountains, large lakes) may also play a large role. The mission will be flown day or night, but some compromises affecting data quality (principally altitude) may be necessary to insure safety.

- **MBB BO-105 Helicopters.** The helicopter systems are employed to conduct detailed follow-up monitoring. Their only mission is exhaustive radiological mapping following plume phase and they are equipped exclusively for that mission. They are not equipped for operating in or near a plume. In contrast to the B-200, which flies a sparse high altitude pattern, the helicopters fly an overlapping low altitude pattern. This, coupled with their greater spatial resolution and sensitivity, provides exhaustive radiological maps that have no gaps nor interpolations. One or more helicopter systems will be employed simultaneously to accelerate completion of the detailed mapping. Also deployed with the helicopter systems is an extensive data analysis capability that is used to improve both sensitivity and accuracy over the "instant" fixed-wing results, described above, plus exploit the full gamma spectroscopic capability of the AMS systems.

Dispatch of the helicopters can be expected within twelve hours of notification. However, the helicopters are limited to VFR operation, which may strongly affect their arrival time and duty time on scene. That is, their operation is restricted to weather conditions with better than a 1000 ft. AGL ceiling and 3 miles of visibility. Acquisition missions will be conducted during daylight hours only, because of the hazards of low altitude flight. Until the helicopter systems arrive all mapping will be limited to the fixed-wing aircraft.

Transit times to the site will be the ferry time listed in Table J-1 or Figure J-2, plus a one hour fuel stop planned for every two hours of flight. Because pilots are strictly limited to a 14-hour duty period, crew rest stops or enroute crew changes may also be required. Finally, prolonged delays may encountered while waiting for adequate weather conditions to continue. However, operations on scene may be less restricted than enroute flight, because flight minimums are less restrictive at the planned low survey altitudes (150 to 500 ft. AGL). Terrain generally will also be a lesser concern than for B-200 operations.

Step 4

Coordinate monitoring plan for utilization of AMS assets.

The DOE Remote Sensing Laboratory in Las Vegas will establish a "Home Team," whose function is coordination and planning of the initial mission while the fixed-wing aircraft is enroute. Specifically, this includes information gathering/passing, setting up meetings and contacts, arranging for logistical needs and augmented technical support (Geographic Information System {GIS} or detailed calculations). Until the aircraft arrives on scene all

contact with AMS should be channeled through the Home Team at (702) 295-1075 {FAX 295-8648}.

Upon arrival of the B-200 fixed-wing aircraft for the initial mission it will be necessary for on scene principals (senior DOE official, RAP and, if possible, LFA and state) to meet with AMS flight crew and coordinate with the Home Team. The purpose of this meeting will be to finalize plans for the initial AMS mission. Additional meetings will be required to plan subsequent flights until FRMAC becomes operational at which time AMS becomes one of the FRMAC monitoring assets.

Step 5

Select mission options for initial utilization of AMS fixed-wing asset (B-200).

- **B-200 Fixed-Wing Initial Missions.** The B-200 fixed-wing aircraft are long range, all-weather, IFR rated aircraft, which are equipped with gamma mapping instruments, high purity germanium gamma spectrometer and isokinetic air samplers with quick-look analysis capability. Their primary mission is rapid deposition mapping, but they are also capable of plume tracking and airborne air sampling. Mission options are pre-planned for both post-plume phase and plume phase.

The post-plume phase mission is the most comprehensive and will be discussed first, because the other options are based upon it. This mission option is called the "Whole Plume Survey." In this mission the B-200 will monitor the entire EPZ plus predicted impact areas outside the EPZ quickly by flying a very sparse pattern at high altitude. Sensitivity is sufficient to address early health effects and both EPA early and intermediate phase PAGs. Results (exposure rates) are presented as a color-coded path on a map delivered upon landing. Observations of 1000, 10 and 1 mR/hr will be plotted explicitly, if present. After post-flight processing the quality of results can be greatly improved and will be presented on a GIS generated map. Gamma spectra are also acquired, which are monitored in flight for evidence of radio-iodine and analyzed after landing to estimate radionuclide mix. Spectroscopy results will be provided shortly after landing. Key findings (peak exposure rates or detection of radio-iodine) can be radioed while yet in-flight.

During plume phase three mission options have been planned. In order of preference they are: 1) Plume tracking, 2) Whole Plume Survey On Top and 3) Plume Penetration. These missions should be repeated regularly until the release has terminated and the plume dissipated. Although prepared for flight into the plume, it is to be avoided to protect the aircraft from contamination, which may compromise its further utilization, and to minimize crew exposure.

The preferred plume phase missions are Plume Tracking and Whole Plume Survey On Top. Plume Tracking navigates the B-200 around the perimeter of the plume maintaining an exposure rate of approximately ten times background. The objective of this mission is direct determination of the actual plume location, which can be used to evaluate PARs and

validate/adjust atmospheric transport models. Results (flight path) resemble an isoradiation contour and are presented on a map delivered upon landing. Peak exposure rate observations will be reported via radio. Gamma spectra are acquired, monitored in flight for evidence of radio-iodine, and analyzed in detail after landing. Reports of radio-iodine can be radioed but gamma spectroscopy results will be provided shortly after landing.

The second option, "Whole Plume Survey On Top," attempts to fly a complete Whole Plume Survey as described earlier but on top of a plume trapped below an inversion. The objective of this mission is to map exposure rates present in the actual plume and locate regions where early health effects may be possible. Basically, the mission is identical to that described for post-plume phase but above and exterior to the plume. The value and quality of data obtained with this mission is much better than with Plume Tracking. However, this mission is only practical if the inversion traps the plume at low altitudes. Results are reported exactly as described earlier for the Whole Plume Survey. That is, results (exposure rates) are presented as a color-coded path on a map delivered upon landing. Observations of 1000, 10 and 1 mR/hr exposure rate or detection of radio-iodine will be radioed in-flight. Plots will explicitly highlight exposure rates of 1000, 10 and 1 mR/hr. After post-flight processing results will be presented on a GIS generated map. Results from gamma spectroscopy are analyzed and reported after landing to estimate radionuclide mix.

The final and least desired options are **Plume Penetration for Plume Mapping** or **Plume Penetration for Airborne Air Sampling**. The Plume Mapping mission may be indicated if 1) mapping of a highly vertically diffused plume is necessary or 2) if measurements to determine the source term are required (unmonitored pathway release). The Plume Mapping mission resembles the Whole Plume Survey except that it is performed interior to the plume. This mission returns the highest quality data on the exposure rate and isotopic mix in the plume. However, it may not be possible to discriminate the airborne plume from a footprint deposited earlier. Results are reported exactly as described above for the Whole Plume Survey (on Top).

The Airborne Air Sampling mission seeks to measure the source term composition or detect very low level airborne radioactivity. This mission may be indicated in two cases respectively: 1) if the source term is unknown (unmonitored pathway release) or 2) if a plume must be tracked very far downwind (model confirmation or documentation of international impact). The Airborne Air Sampling mission is conducted as a series of transects across the plume. High volume samples are returned for laboratory analysis. Low volume samples can be counted in flight for gross gamma/beta activity and results radioed. As with the Whole Plume Survey, results (exposure rates) are presented as a color-coded path on a map with special emphasis for key levels and is delivered upon landing. Similarly, gamma spectroscopy results for radio-iodine and post flight analysis will also be provided.

WARNING: Contamination of the aircraft may compromise its utility for subsequent missions. Ground handling, e.g., landing, refueling and servicing, of a contaminated aircraft may encounter contamination control and political complications.

Step 6

- **B-200 Follow-Up Missions.** Utilize AMS assets available to fullest extent.

After completion of the initial mission, aircraft and crew flight time may remain available for additional missions or a second B-200 might arrive. Recall that the flight lines of the initial mission were selected such that the entire EPZ and predicted footprint could be covered in a single flight. Therefore, flight lines may be many miles apart. Subsequent B-200 flights could be used to improve both detail and sensitivity until the helicopter systems arrive. Specifically, it may be useful to fill in gaps or overfly all populated areas that were missed in the initial mission. It may also be prudent to fly further downwind to confirm adequacy of the coverage.

CAUTION: High deposition areas may be found at large distances from the origin due to rain or other atmospheric conditions.

If the impact area is very large, an exhaustive fixed-wing survey should be performed before the detailed helicopter survey, because it can be completed much sooner. With post-flight data processing it is possible to both greatly improve sensitivity and map only specific radionuclides. This processing will require arrival of the main FRMAC party assets (REDAC mini-system or data van). These results can be plotted as contour maps of decay corrected man-made exposure rate or specific radionuclide deposition, which will be presented both as plotted by REDAC and on GIS.

Step 7

- **BO-105 Helicopter Missions.** Conduct detailed radiological mapping or surveillance for unmonitored releases.

CAUTION: The ingestion pathway PAGs may be exceeded at considerable distances from the origin (>50 miles). Localized concentrations, "hot spots," may be created by rain or other atmospheric conditions.

The BO-105 helicopters are VFR rated aircraft equipped only with gamma mapping instruments. The primary mission of the helicopters are detailed post-plume phase deposition mapping, but they are also capable of pre-release surveillance. If releases are ongoing, then helicopter missions should be planned to map only the footprint well away from the present plume.

The pre-release phase mission option is called "Plume Detection Orbits." In this mission the helicopter will circle the plant to detect any evidence of an unmonitored release. The mission could be conducted either periodically or continuously. If periodic, the periodicity can be several times per hour, if the helicopter is based near the plant. If continuous, the mission could be sustained for up to two hours. The mission will be terminated immediately upon detection of a plume and one of the B-200 plume phase missions will be initiated. In

the pre-release phase use of the helicopter system is preferred over the B-200, because it can fly lower and closer to the plant with greater safety. However, this mission is also possible with the B-200, if necessary.

The objective of the **post-plume phase** mission option is primarily to map where contamination may exceed the ingestion PAGs. If there is a small ongoing release, it will be necessary to conduct this survey only when upwind of the release to avoid degradation of sensitivity. These missions will use one or more helicopters simultaneously flying two or more missions per day to map the entire potentially impacted region with great detail and maximum sensitivity. The missions are planned as a series of flights with over-lapping detector footprints whose line spacing may be as small as 250 feet. This assures that no gaps exist in the map and facilitates area averaging to enhance sensitivity. Because each helicopter flight only maps a small portion of the whole area, such detailed mapping requires several days of flying.

Data analysis will be conducted on-site using the REDAC mini-systems or data vans. These analyses will be completed after every flight and results incorporating all data acquired to date will be presented as GIS plots. Preliminary results will be issued approximately two hours after each flight. Refined results, reflecting detailed corrections and normalizations, may lag up to 12 hours. All results are presented either as contour maps of decay normalized man-made exposure rate or as concentration of a marker isotope. Plotted second-by-second the data has the best resolution and excellent sensitivity. But sensitivity in outlying regions can be increased by area averaging which sacrifices spatial resolution. Generally, sensitivity is sufficient to map regions exceeding ingestion preventative PAGs. ***Note: The milk preventative pathway Derived Response Level is 0.13 microCi/m^2 for ^{131}I and 3 microCi/m^2 for ^{137}Cs (see RTM Section K). The produce preventative pathway Derived Response Level is 0.87 microCi/m^2 for ^{131}I and 24 microCi/m^2 for ^{137}Cs (see RTM Section K).*** Concentrations of marker isotopes corresponding to ingestion DRLs will be highlighted.

CAUTION: The following caution statement should be included with all aerial data and be noted in any discussion.

Reported radiation levels have been inferred from aerial measurements acquired at an altitude of _____ feet above ground level (AGL). Radiation levels and concentrations assume uniformity over the detector's field-of-view, whose radius is approximately equal to the altitude flown. If flight lines are spaced greater than this diameter, then gaps exists which may miss high dose rate or high deposition areas. If high deposition areas are smaller than this diameter, then the magnitude may be significantly underestimated.

Form J-1. Radiological Emergency Notification and Evaluation Form

1. What is the degree of urgency?

2. Location:
   - Site name
   - City/State
   - Environment (urban, rural, costal, mountainous...)
   - Nearest airport
   - Location of emergency response teams' base of operations

3. Plant Status:
   - Release? (terminated, in progress or imminent)
   - Core damage? (actual/projected/potential)
   - Dominant radionuclides in mix? (measured/predicted)
   - Is the plant stable?

4. Are model predictions or field measurements available from state or LFA?
   (ask for copies to be faxed to Home Team)
   - Plume or deposition extent (footprint)
   - Exposure rate and Dose projections

5. What protective actions are in place or planned? Where?
   Are state/county PAGs same as EPA?

6. What are the specific areas of interest or highest priority?

7. Identify principle contacts (name, location, phone, FAX):
   - NRC PMT Dose Assessment Analyst
   - NRC PMT Monitoring and Assessment Coordinator (MAC)
   - NRC Site Team leader
   - State radiological health
   - Senior state official on-site
   - DOE RAP team leader

Table J-1. Estimated AMS Travel Times from Takeoff to Selected NRC Sites

No.	Point Name	Location	Travel time[a] (in hours) by aircraft and point of origin			
			B-200/ RSL[b]	BO-105/ RSL[c]	BO-105/ WAMO[d]	B-200/ WAMO[e]
1.	Arkansas Nuclear One	Russelville West, AR	6.5	33	28	4
2.	Beaver Valley	Hookstown, PA	10		3	1
3.	Big Rock Point	Bayshore, MI	9		10	2.5
4.	Browns Ferry	Jones Crossroad, AL	8.5		10	3
5.	Brunswick	Southport, NC	11		5	1.5
6.	Calvert Cliffs	Cove Point, MD	11		1	1
7.	D C. Cook	Bridgeman, MI	8.5		8	2.5
8.	Cooper	Nemaha, NE	5.5	31	29	4
9.	Crystal River	Red Level, FL	10		11.5	4
10.	Davis Besse	LaCarne, OH	9.5		6	1.5
11.	Diablo Canyon	Port San Luis, CA	1.5	5		10
12.	Dresden	Minooka, IL	8.5		10	2.5
13.	Duane Arnold	Shellsburg, IA	6.5	34	26	3.5
14.	Farley	Gordon AL, GA	9.5		11	3
15.	Fitzpatrick	West of Texas, NY	11		5	1.5
16.	Fort Calhoun	Modale IA, NE	5.5	31	29	4.5
17.	Ginna	Furnaceville, NY	10.5		5	1.5
18.	Haddam Neck	Deep River, CT	11.5		4	1.5
19.	Hatch	Baxley, GA	10		8.5	2.5
20.	Indian Point	Peekskill, NY	11		3.5	1
21.	Kewaunee	Kewaunee, WI	8.5		10	3
22.	Lasalle	Odell, IL	7		10	2.5
23.	Maine Yankee	Westport, ME	13		7.5	2.5
24.	McGuire	Lake Norman SC	10		5	1.5
25.	Millstone	Niantic, CT	12.5		5	1.5
26.	Monticello	Monticello, MN	6.5	34	29	4.5
27.	Nine Mile Point	West of Texas, NY	11.5		5	1.5
28.	North Anna	Lake Anna, VA	11		1	1
29.	Oconee	Old Pickens, SC	9.5		7	2
30.	Oyster Creek	Forked River, NJ	12.5		2	1
31.	Palisades	South Haven, MI	8.5		8.5	2.5
32.	Peach Bottom	Holtwood, PA	11		1	1
33.	Pilgrim	Manomet, MA	13		6	2
34.	Point Beach	Kewaunee, WI	8.5		10	3
35.	Prairie Island	Welch, MN	7	34	27.5	4
36.	Quad Cities	Cordova, IL, IA	7.5		11	3
37.	Robinson	Lake Robinson, SC	10.5		5.5	1.5
38.	Salem	Taylors Bridge, NJ	12		1	1
39.	Hope Creek	Taylors Bridge, NJ	12		1	1
40.	San Onofre	San Onofre Bluff, CA	1	3.5		10

No.	Point Name	Location	Travel time[a] (in hours) by aircraft and point of origin			
			B-200/ RSL[b]	BO-105/ RSL[c]	BO-105/ WAMO[d]	B-200/ WAMO[e]
41.	St. Lucie	Eden, FL	12		26	3.5
42.	Sequoyah	Snow Hill, TN	9		8	3
43.	Summer	Jenkensville, SC	10		6	2
44.	Surry	Hog Island, VA	11.5		1.5	1
45.	Three Mile Island	Middletown, PA	11		1	1
46.	Trojan	Ranier, OR, WA	4.5	26.5		10
47.	Turkey Point	Arsenicker Keys, FL	12		28.5	4
48.	Vermont Yankee	Brattleboro, VT, NH	12.5		5.5	1.5
49.	Zion	Zion, IL, WI	8.5		10	2.5
50.	Byron	Byron, IL	8		11	3
51.	Callway	Fulton, MO	7		26	3.5
52.	Catawba	Lake Wylie, SC	10		5.5	1.5
53.	Clinton	Clinton, IL	8		10	3
54.	Comanche Peak	Glen Rose, TX	5.5	27		5.5
55.	Grand Gulf	Port Gibson, MS	7.5		28	4
56.	Harris	Bonsal, NC	10.5		3.5	1
57.	Palo Verde	Wintersburg, AZ	1	3.5		8.5
58.	Perry	North Perry, OH	9.5		5	1.5
59.	River Bend	St. Francisville, LA	7.5		28.5	4.5
60.	Seabrook	Seabrook, NH	13		6.5	2
61.	South Texas	Bay City, TX	6	26.5	16	5.5
62.	Susquehanna	Berwick, PA	11.5		2	1
63.	Waterford	Taft, LA	8.5		28.5	4.5
64.	Wolf Creek	Burlington, KS	5.5	30	29	4.5
65.	WNP-2	Richland, WA	4		26	9.5
66.	Braidwood	Braidwood, IL	8		10	3
67.	Vogtle	Waynesboro, GA	10		7.5	2.5

Times Include Stops for Refueling and Crew Rest. Unforseen Delays Due to Weather or Refuel Will Increase Times. Notification and Initial Mission Planning Times Are Not Included.

[a]Times listed include stops for refueling and crew rest periods; they do not include notification and initial mission planning times. Unforeseen delays due to weather or during refueling will increase times.

[b]Beechcraft B-200 fixed-wing aircraft based at the Remote Sensing Laboratory, Nellis Air Force Base, Las Vegas, Nevada.

[c]BO-105 helicopter based at the Remote Sensing Laboratory, Nellis Air Force Base, Las Vegas, Nevada.

[d]BO-105 helicopter based at Washington Aerial Measuring Operations, Andrews Air Force Base, near Washington, D.C.

[e]Beechcraft B-200 fixed-wing aircraft based at Washington Aerial Measuring Operations, Andrews Air Force Base, near Washington, D.C.

Table J-2. Visual Flight Rules for AMS Helicopters[a]

Terrain	Day		Night	
	Ceiling (feet AGL)	Visibility (statute miles)	Ceiling (feet AGL)	Visibility (statute miles)
Flat	1000	3	1000	5
Mountainous	2000	3	2000	5

[a]During an actual emergency, the weather criteria may be reduced on a case-by-case basis based upon the location of the emergency, the terrain enroute, and the terrain at the site of the emergency.

Figure J-1. DOE Fixed-wing Monitoring Aircraft Flight Times to Selected NRC Sites

Concentric circles from DOE's Remote Sensing Laboratory Nellis Air Force Base, Las Vegas, NV, depicting 240 miles distance or approximately 1 hour flight time for the B-200 fixed-wing aircraft. Table J-1 provides a legend for plant numbers.

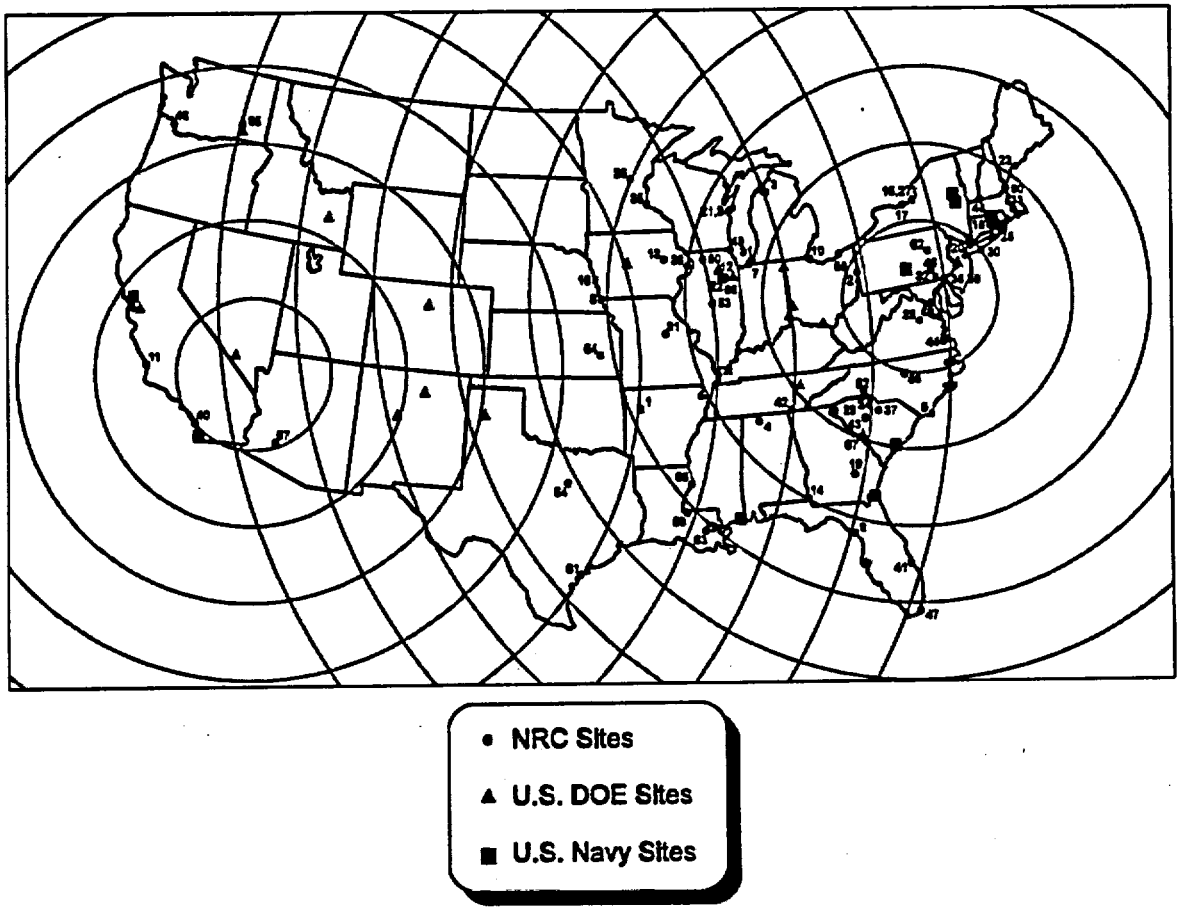
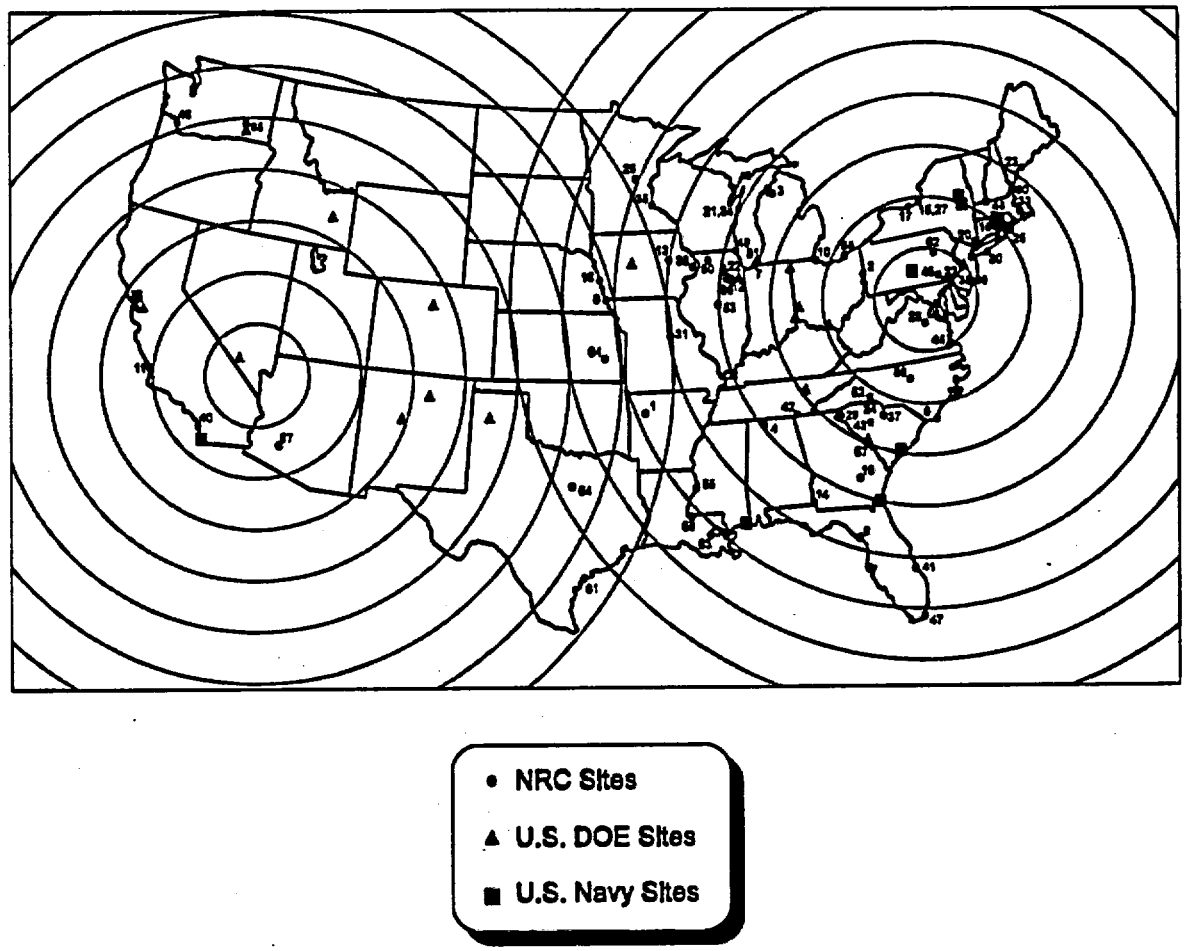
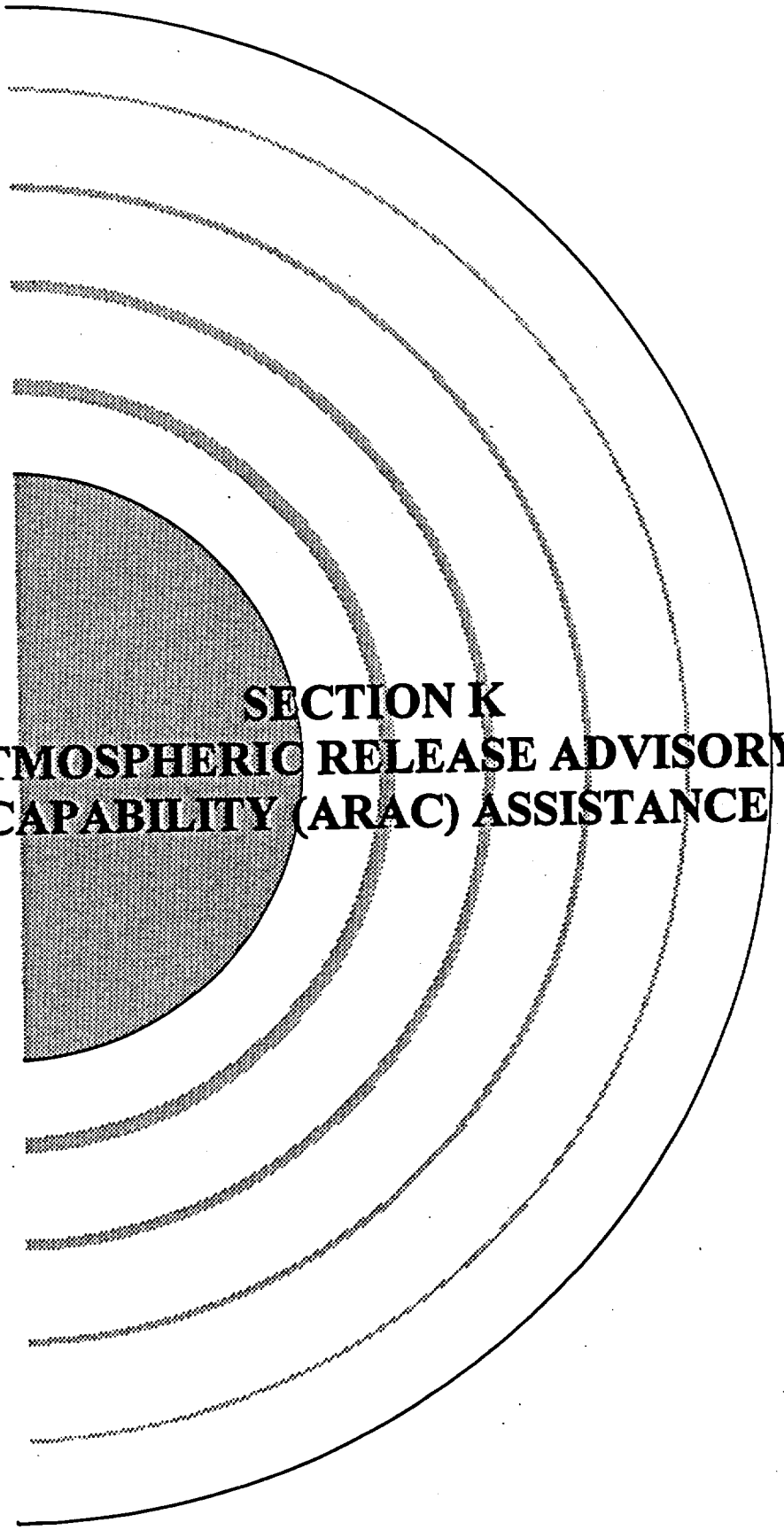


Figure J-2. DOE Helicopter Monitoring Aircraft Flight Times to Selected NRC Sites

Concentric circles from DOE's Remote Sensing Laboratory, Las Vegas, NV, and the Washington Area Measurements Operations depicting 160 miles or approximately 2-hrs flight time for the BO-105 helicopter. Table J-1 provides a legend for plant numbers.





SECTION K
ATMOSPHERIC RELEASE ADVISORY CAPABILITY (ARAC) ASSISTANCE

SECTION K
ATMOSPHERIC RELEASE ADVISORY CAPABILITY (ARAC) ASSISTANCE

ATMOSPHERIC RELEASE ADVISORY CAPABILITY (ARAC) ASSISTANCE

Objective

This section explains how to obtain projections from the U.S. Department of Energy's (DOE's) Atmospheric Release Advisory Capability (ARAC) Center.

Discussion

Under the direction of DOE, ARAC provides projections of the consequences of radiological or toxic accidents based upon dispersion model calculations that include terrain and regional meteorological data. The ARAC Center is located at Lawrence Livermore National Laboratory (LLNL) in Livermore, CA.

ARAC can produce a wide range of products for single or multiple radioisotopes. Products can include instantaneous, integrated, or time-averaged air concentrations; cumulative dose, or dose rate to the whole body or specific organs, and cumulative deposition. The Reactor Accident System for Consequence Analysis (RASCAL) model input forms are used to provide input to the ARAC assessment.

Guidance

Step 1

Call the ARAC Center emergency phone number:

(510) 422-9100 (24 hours a day, 7 days a week).

The ARAC Center is staffed from 7:30 a.m. to 4:15 p.m. Pacific time. During these hours, an assessor will answer the emergency line. After hours, the call will be forwarded to the LLNL Fire Dispatch. Ask for ARAC assistance, and Fire Dispatch will forward your call to the assessor on call.

Step 2

If the incident involves a nonradioactive atmospheric release, go to Step 5.

Complete the following input forms:

- ST-Dose Data Worksheet;
- ST-Dose Plant Conditions; and
- ST-Dose Weather Data Sheet.

Put the name and phone number of the person ARAC can contact if there are questions about the information on each form. Make sure the time zone is identified as local daylight, local standard, or Universal Time Coordinated (UTC).

Fax the completed forms to the ARAC Center. Primary fax number: (510) 423-4527
Backup fax number: (510) 422-5924

Step 3

ARAC will prepare an initial set of projected dose and deposition plots for Cs-137, I-131, and Xe-133. A default source rate of 1.0 Ci/s for each nuclide will be used. These initial plots can be useful for near-term plume location and guidance for early field measurements. The initial, normalized plots should be completed and sent to you within 30 minutes when the ARAC Center is staffed. It may require as much as an additional 60 minutes after hours. Figure K-1 contains a sample ARAC plot and a guide to its interpretation.

Step 4

While the normalized plots are being prepared, another assessor will begin a calculation based on your specified source term. Radioisotopes and source rates that you provide or the RASCAL nuclide mix based upon given plant conditions will be used. The plots will include projections of the effective dose equivalent from both exposure to the plume and from deposited materials, the 50-year committed effective dose equivalent (CEDE) due to inhalation, and the combined 4-day total effective dose equivalent (TEDE). The contours will be based on the U.S. Environmental Protection Agency (EPA) early phase PAGs. You may request other products or assessments for other nuclides, times, or contours.

Go to Step 6.

Step 5

For a nonradioactive atmospheric release, complete the ST-Dose Weather Data Sheet. ARAC needs to know what was released and when it was released to the atmosphere. You can use the ST-Dose Data Worksheet, neglecting all the radioisotope information, or use a separate piece of paper. Make sure the following information is provided to ARAC:

- The hazardous/toxic chemicals involved in the accident;
- Amount or estimates of the amount of chemical released;
- Location of the release (if not at a known nuclear facility, provide the latitude and longitude or a clear description of the accident location);
- The time of the start of the release to the atmosphere and, if it has ended, when it stopped; and

- The kinds of plots that are required (e.g., concentration in parts per million of a given chemical or averaged air concentrations) and the desired contour values, such as the Emergency Response Planning Guidelines (ERPGs).

Put the name and phone number of the person ARAC can contact if there are questions about the information on each sheet. Make sure the time zone is identified as local daylight, local standard, or UTC.

Fax the completed forms to the ARAC Center. Primary fax number: (510) 423-4527
Backup fax number: (510) 422-5924

Step 6

Update the ARAC Center as new information becomes available. Use the ARAC emergency number [(510) 422-9100)] for additional contact with the center. Fax updated input forms and new weather information as they become available. Local weather conditions are very important to the calculations.

ARAC can adjust source rates by comparing computed values to field measurements. Please fax any preliminary measurement data as soon as it is available.

ARAC will continue to produce updates of near term plots every 1 to 3 hours as new meteorological or source term information dictates. For a large-scale accident, ARAC can make projections based upon forecast meteorology and projected source terms up to 72 hours in the future.

Source: Sullivan, et al., 1993.

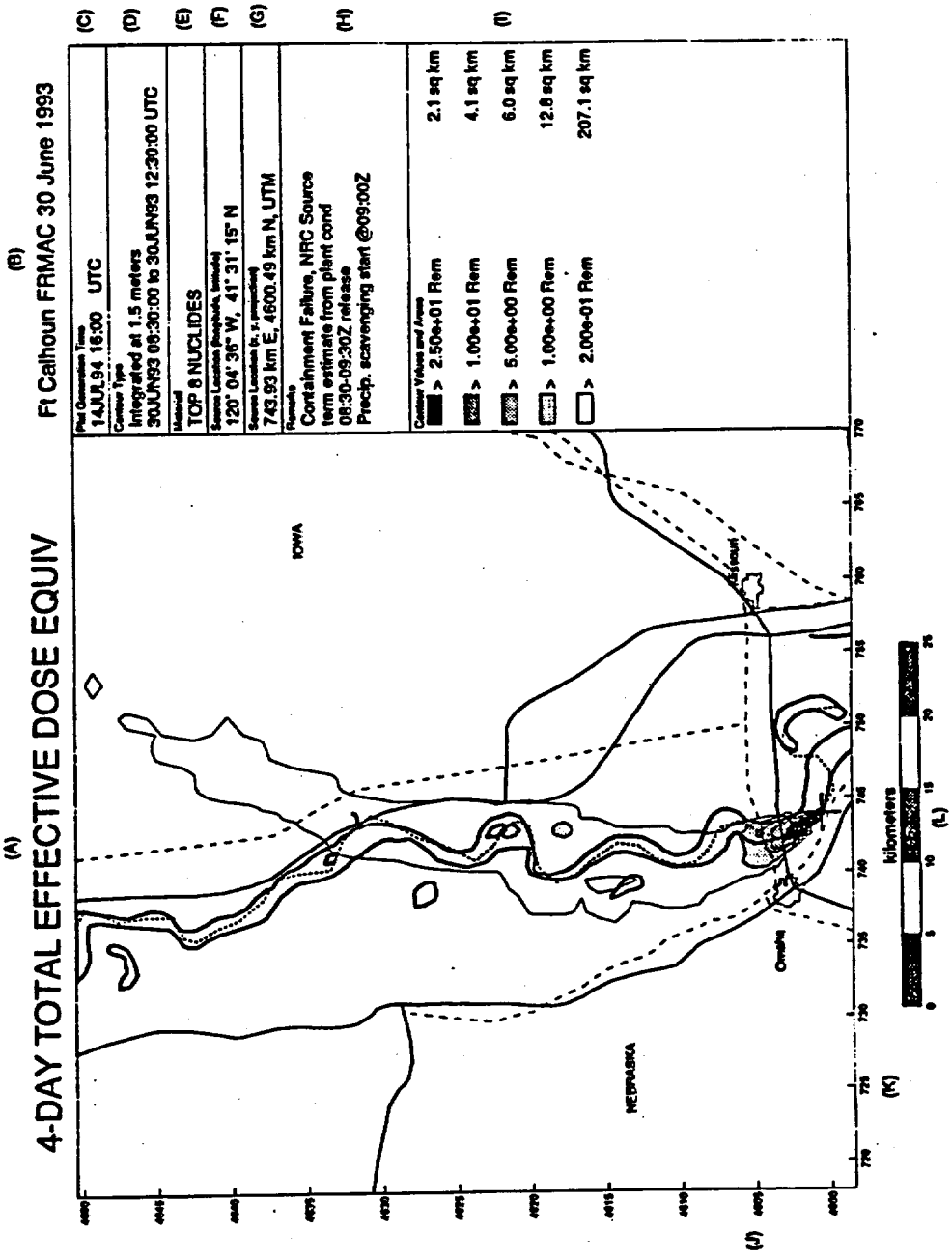
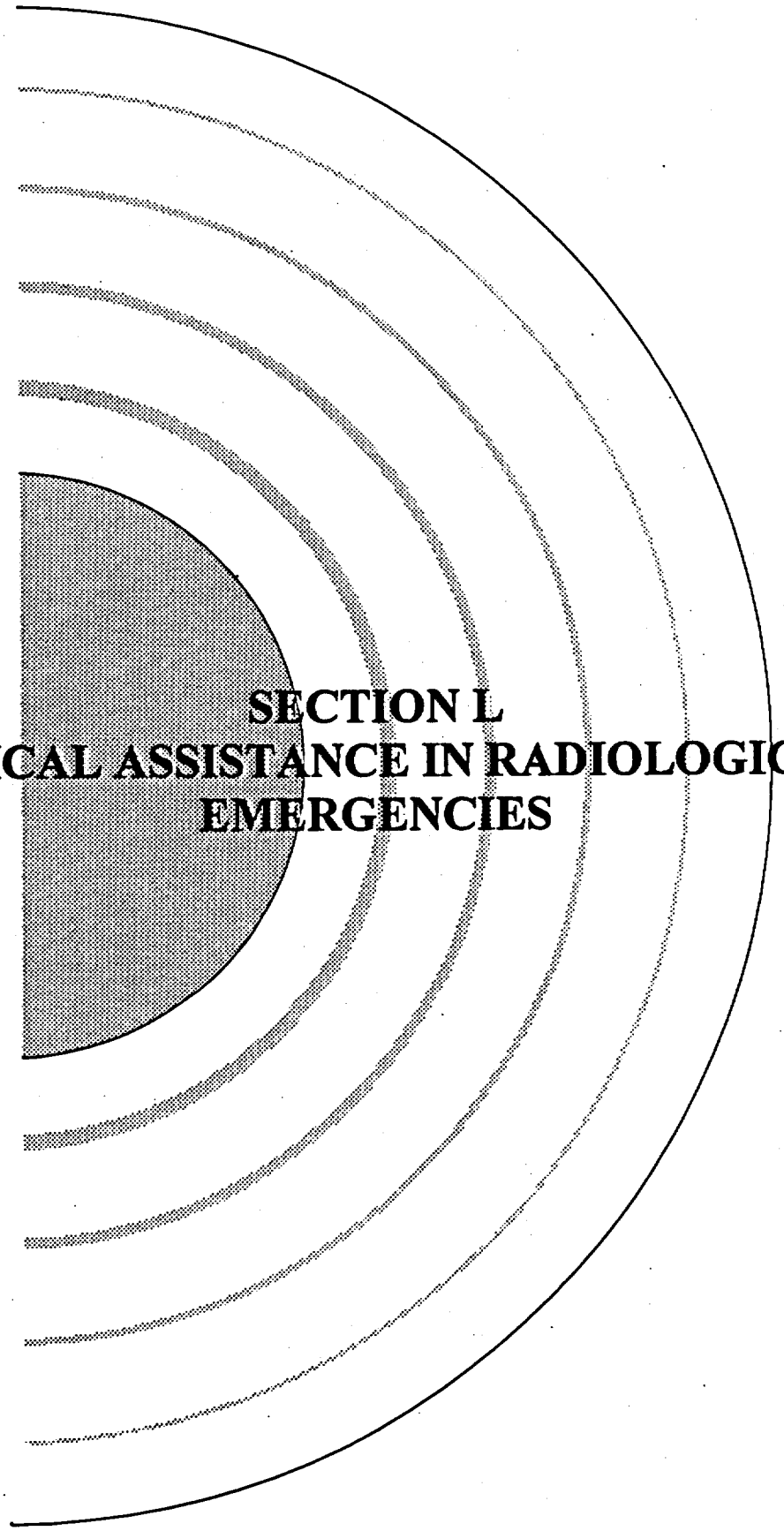


Fig. K-1. Sample ARAC plot.

Notes for Fig. K-1

(A) ARAC plot title—the kind of ARAC product.
(B) Legend title—this area usually identifies the event.
(C) Plot generation time—the date and time (in UTC) that the ARAC Center generated this product.
(D) Contour type—this parameter indicates the type of contour in the plot. Possible types are integrated, instantaneous, or total deposition. For integrated or total deposition, the time will be the interval over which the product was calculated. For instantaneous contours, the time indicated is the time when the product is valid.
(E) Material—the material used in the source term.
(F) Source location (latitude/longitude)
(G) Source location [Universal Transverse Mercator (UTM) easting and northing coordinates]
(H) Remarks—up to four lines of text added by ARAC to help explain the product.
(I) Contour values and areas—This block indicates the value and units of the isopleths on the plot. Contour values can be specified to ARAC. Additionally, the total area enclosed by each isopleth will be shown in square kilometers. Note that the area shown by each value includes the area of all higher values.
(J) Tick marks and values indicate the UTM northing (Y-axis) coordinates.
(K) Tick marks and values indicate the UTM easting (X-axis) coordinates.
(L) Kilometer scale.



SECTION L
MEDICAL ASSISTANCE IN RADIOLOGICAL EMERGENCIES

SECTION L
MEDICAL ASSISTANCE IN RADIOLOGICAL EMERGENCIES

Page

MEDICAL ASSISTANCE IN RADIOLOGICAL EMERGENCIES

Objective

To obtain medical guidance in dealing with radiation exposure or radiological contamination for someone at the scene of the emergency or at a hospital.

Discussion

CAUTION: Do not give medical advice yourself; you may be held personally liable. Medical advice includes, but is not limited to, recommending medications, medical diagnostic tests, management of wounds or radiation injuries, or giving a prognosis concerning radiation injuries.

The U.S. Nuclear Regulatory Commission (NRC) cannot give medical advice. Refer the person needing assistance to other groups that may help. Reactor sites have identified medical facilities capable of responding to radiation emergencies. For other sites, or if more assistance is needed, refer the caller to the Radiation Emergency Assistance Center/Training Site (REAC/TS) (pronounced "reacts").

Guidance

Step 1

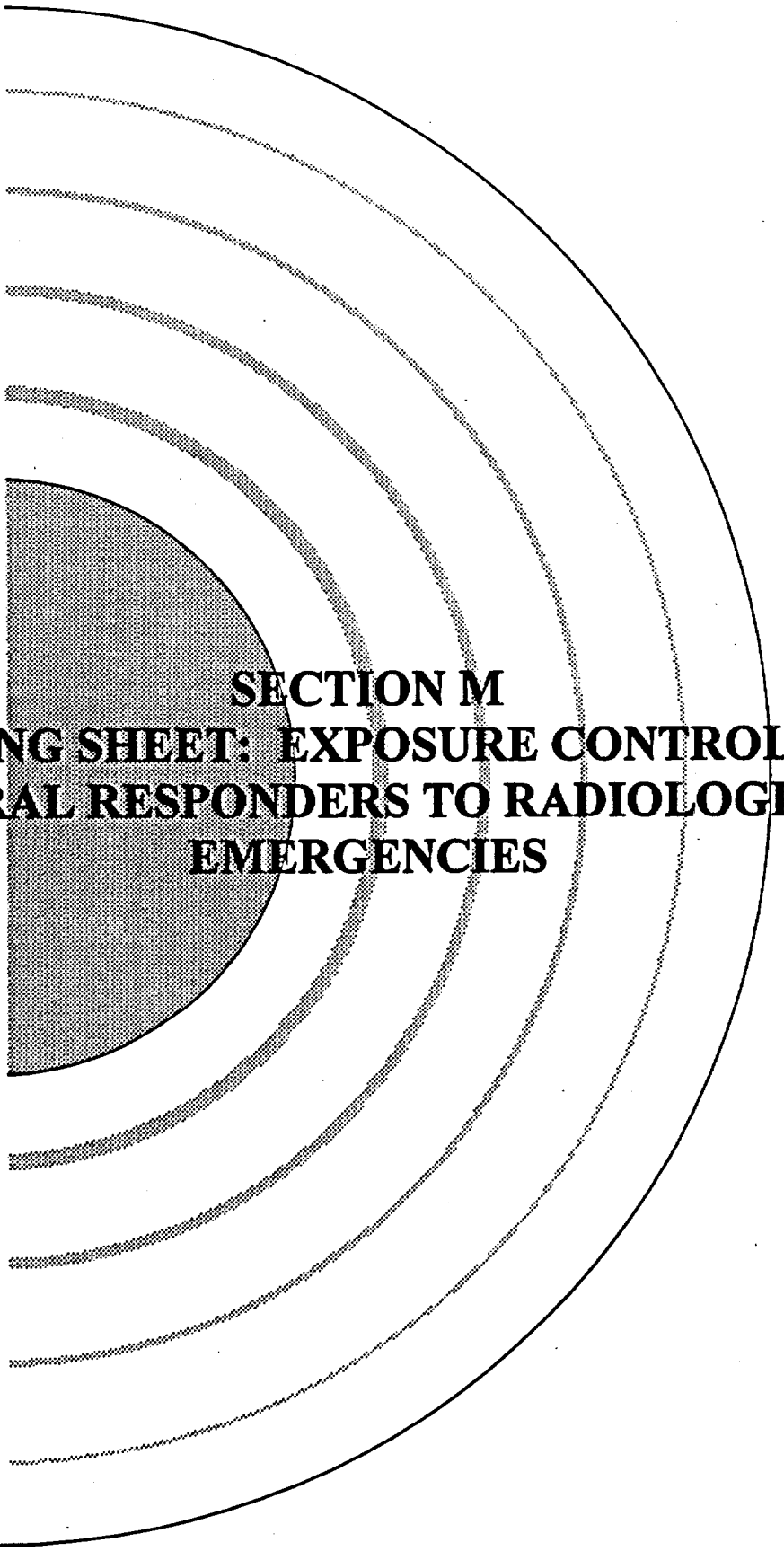
If medical advice is requested, direct the caller to REAC/TS at one of the numbers below.

Day time	REAC/TS	(615) 576-3131
24 hours	Methodist Medical Center (switchboard) (Ask them to alert REAC/TS team)	(615) 481-1000

Step 2

Refer to the following information to answer questions about REAC/TS:

REAC/TS is a U.S. Department of Energy (DOE) response asset that maintains a radiological emergency response team in Oak Ridge, TN, consisting of physicians, nurses, health physicists, coordinators, and necessary support personnel. REAC/TS is on 24-hour call to provide first-line responders with consultative or direct medical and radiological assistance at the REAC/TS facility or at the accident site. REAC/TS personnel have expertise in and are equipped to conduct (1) medical and radiological triage; (2) decontamination procedures and therapies for external contamination and internally deposited radionuclides, including diethylenetriaminepentaacetic acid (DTPA) chelation therapy; (3) diagnostic and prognostic assessments of radiation-induced injuries; and (4) radiation dose estimates by methods that include cytogenetic analysis, bioassay, and in vivo counting.



SECTION M
BRIEFING SHEET: EXPOSURE CONTROL FOR FEDERAL RESPONDERS TO RADIOLOGICAL EMERGENCIES

SECTION M
BRIEFING SHEET: EXPOSURE CONTROL FOR FEDERAL RESPONDERS TO RADIOLOGICAL EMERGENCIES

BRIEFING SHEET
EXPOSURE CONTROL FOR FEDERAL RESPONDERS TO RADIOLOGICAL EMERGENCIES

Discussion

The U.S. Environmental Protection Agency's (EPA) "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents" (EPA 400-R-92-001, May 1992) establishes limits for workers performing emergency services. These limits apply to Federal personnel and their contractors and correspond to doses incurred over the duration of the emergency. This briefing sheet provides general guidance to all Federal personnel and their contractors responding to a severe radiological accident involving significant releases (or potential releases) of radioactivity and involving emergency support activities.

Standing Radiological Instructions

[ ] Do not proceed to within about 20 miles of the emergency site or within a contaminated area unless you have received a briefing on current radiological conditions.

[ ] Continuously monitor ambient or background radiation levels while approaching the site. If applicable, ensure that the audible options of the survey meter and electronic personnel dosimeters (EPD) *are enabled.*

[ ] Unless otherwise approved, do not enter areas exceeding 100 mrad/hr ("turn-back" limit) or areas having plus or minus 20% of expected dose rates. Contact the local, designated U.S. Nuclear Regulatory Commission (NRC) authority or the NRC Operations Center [(301) 816-5100 or (301) 951-0550] for further direction.

[ ] Unless otherwise approved, the maximum allowed accumulated total effective dose equivalent (TEDE) is 5 rem except for lifesaving actions. The 5 rem TEDE limit corresponds to a self-reading dosimeter (e.g., EPD) reading of about 2 rad - this ratio (that is, the direct field dosimeter reading versus the assigned TEDE estimates) may be adjusted by the NRC Protective Measures staff based on known radioactive material release data. For lifesaving, the individual may exceed the 5 rem TEDE limit but must be a volunteer and fully aware of the risks involved.

CAUTION: These dose limits do not apply to declared pregnant female emergency workers. An exposure limit of 500 mrad (0.5 rad) TEDE is necessary to limit possible health effects to the fetus. Exceeding this exposure limit requires additional approval.

The briefing on accident conditions and any special instructions via the NRC Operations Center [(301) 816-5100 or (301) 951-0550] or other designated authority (i.e., NRC site team Protective Measures Coordinator) should include:

[ ] Radiological and other (e.g., chemical) hazards and their sources (e.g., ground releases) in the vicinity of the accident and along the transit route and the associated protective actions recommended by the licensee or other authority.

[ ] Expected dose rates and required actions if the expected dose rates are exceeded.

[ ] Facility current status (e.g., are releases underway or expected? Is the plant stable? Are emergency services needed?).

[ ] Means of obtaining authority to exceed limits (location and means of contacting the individual responsible for Federal worker radiation protection) and directions for maintaining communications.

Person and Title _____

Telephone Number(s) _____

[ ] If the accident involves actual or projected core damage at a reactor or if the accident involves the potential for a radioiodine release, potassium iodide (KI) should be taken, *under appropriate direction (e.g., NRC Protective Measures Coordinator)*, before proceeding to the vicinity of the accident.

NOTE: To be most effective, KI should be taken *before* or just after the intake of radioiodine. KI should not be taken if a known allergic condition exists or if the worker does not have a thyroid gland; the responsible authority should be made aware of the aforementioned conditions.

Step 1

Prior to departure to the vicinity of the accident:

Obtain the following:

[ ] Self-reading dosimeters [e.g., 0-200 mR and 0-50 R, electronic personnel dosimeters (EPDs)]
[ ] Thermoluminescent dosimeter (TLD)
[ ] Dosimeter instruction card (if applicable)
[ ] Dosimetry/Instrument Report Form (Attachment 1)
[ ] KI (potassium iodide) tablets and "KI Receipt Form"
[ ] Ion Chamber Survey Meter (e.g., Bicron RSO-2)
[ ] A completed NRC Form 262, Approval Request for Personnel Exposures in Excess of Region I Administrative Limits

NOTE: Groups of personnel responding to the accident shall have at least one Pressurized Ion Chamber (PIC). Other gamma radiation detectors (dose rate meters) may be substituted. All personnel entering high radiation areas shall have EPDs.

Perform the following:

[ ] Attend briefing, if conducted

[ ] Check and zero/charge self-reading dosimeters

[ ] Verify the calibration date of each instrument, perform battery and source or functional checks, and obtain extra batteries

[ ] If provided with an alarming dosimeter (EPD), set the alarm at a dose rate of 100 mrad/hr and an accumulated dose of 2,000 mrad (2 rad)

[ ] Fill out the Dosimetry/Instrument Report Form, including applicable information, such as the serial numbers of all equipment and the initial reading of all dosimetry

[ ] Read the KI Receipt Form and complete the signature page

Step 2

Upon arrival in the vicinity of the accident (i.e., at the airport or Field Office), and prior to entry into the area of concern:

[ ] Obtain an update on the radiological conditions at the facility and any special instructions, based on actual release or potential release data:

Revised total dose limit_____

Revised dose rate limit_____

Revised expected dose rates_____

_____

Plant/release status_____

_____

Route to the effected area (to minimize unnecessary radiation exposure)_____

_____

_____

Meteorological information _____

_____

[ ] Re-check self reading dosimeters.

[ ] Obtain additional dosimetry, etc., from the radiation protection authority at the scene.

[ ] Continuously monitor ambient radiation levels.

[ ] Coordinate entry into licensee's controlled area and comply with licensee's procedures to the extent practicable. If there is any undue delay, notify NRC management.

[ ] If directed by the appropriate authority (e.g., NRC Protective Measures Coordinator) take the initial dosage of KI. KI is necessary if the accident involves actual or projected core damage at a commercial power plant.

[ ] Obtain list of decontamination facilities with direction.

Step 3

Entry into the EPZ (within ~10 miles of the facility) or possibly contaminated area:

[ ] If an access control point is encountered, ask the control point guards or personnel if they are aware of any additional radiological conditions or precautions.

[ ] Maintain periodic contact with the responsible radiation protection authority to receive updates on changes in radiological conditions or additional protective actions.

[ ] Check self-reading dosimeters at least every half hour.

[ ] If you are not in a fixed facility with radiation monitoring, continuously monitor ambient radiation.

[ ] When possible, compare survey meter levels with others.

[ ] If the administrative alarm level of the alarming dosimeter is exceeded (100 mrad/hr or 2 rad), leave the area and contact the appropriate radiological authority for further information.

[ ] If not in a fixed facility with access to an exposure control coordinator and any of the following occurs, immediately leave the emergency planning zone (EPZ) or contaminated area and contact the individual responsible for radiation protection:

a. The dose limit of 5 rem TEDE (2 rad on a self-reading dosimeter reading) or any lower, established limit is approached.

b. The turn-back dose rate of 100 mrad/hr or any lower, established limit is exceeded.

c. Dose rates far greater than expected are encountered (e.g., 5 times expected dose rates).

[ ] Record the final reading for each dosimeter on the Dosimetry/Instrument Report Form at the completion of each assignment, and turn in your TLD to the appropriate authority for processing when directed.

Attachment 1

Dosimetry/Instrument Report Form

1. Dosimetry:

Type _____
Serial Number _____
Calibration Date _____
Initial Reading _____mrad
Dose Rate Alarm Setting _____mrad/hr
Dose Alarm Setting _____mrad
Battery Check [ ]

Type _____
Serial Number _____
Calibration Date _____
Initial Reading _____mrad
Dose Rate Alarm Setting _____mrad/hr
Dose Alarm Setting _____mrad
Battery Check [ ]

Type _____
Serial Number _____
Calibration Date _____
Initial Reading _____mrad
Dose Rate Alarm Setting _____mrad/hr
Dose Alarm Setting _____mrad
Battery Check [ ]

2. Instrumentation:

Model _____
Serial Number _____
Calibration Date _____
Battery Check [ ]
Source/Functional Check [ ]

Model _____
Serial Number _____
Calibration Date _____
Battery Check [ ]
Source/Functional Check [ ]

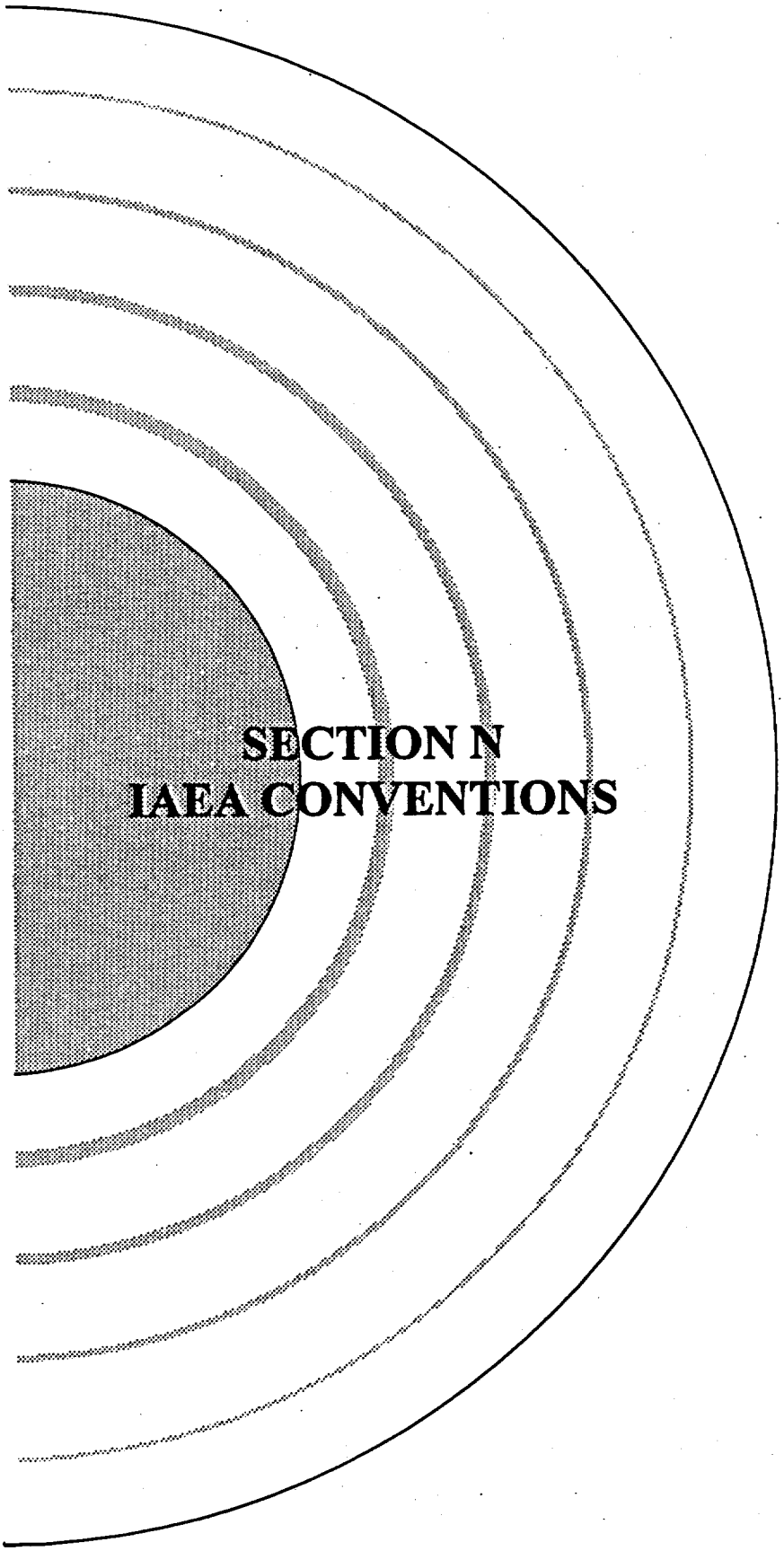
Dosimetry/Instrument Report Form (Cont)

3. Personal Accumulated Dose Record

Name: _____ Initials: _____

Date/ Time						
Initial Reading(mrem) (A)						
Final Reading(mrem) (B)						
Accumulated Dose(mrem) (B-A)						
Accumulated Dose Total (mrem) Σ(B-A)						
Initials						

Date/ Time						
Initial Reading(mrem) (A)						
Final Reading(mrem) (B)						
Accumulated Dose(mrem) (B-A)						
Accumulated Dose Total (mrem) Σ(B-A)						
Initials						



SECTION N
IAEA CONVENTIONS

SECTION N
IAEA CONVENTIONS

INTERNATIONAL ATOMIC ENERGY AGENCY CONVENTIONS

Convention on Early Notification of a Nuclear Accident

THE STATES PARTIES TO THIS CONVENTION

AWARE that nuclear activities are being carried out in a number of States.

NOTING that comprehensive measures have been and are being taken to ensure a high level of safety in nuclear activities, aimed at preventing nuclear accidents and minimizing the consequences of any such accident, should it occur.

DESIRING to strengthen further international co-operation in the safe development and use of nuclear energy.

CONVINCED of the need for States to provide relevant information about nuclear accidents as early as possible in order that transboundary radiological consequences can be minimized.

NOTING the usefulness of bilateral and multilateral arrangements on information exchange in this area.

HAVE AGREED as follows:

Article 1

Scope of Application

1. This Convention shall apply in the event of any accident involving facilities or activities of a State Party or of persons or legal entities under its jurisdiction or control, referred to in paragraph 2 below, from which a release of radioactive material occurs or is likely to occur and which has resulted or may result in an international transboundary release that could be of radiological safety significance for another State.

2. The facilities and activities referred to in paragraph 1 are the following:

(a) any nuclear reactor wherever located;

(b) any nuclear fuel cycle facility;

(c) any radioactive waste management facility;

(d) the transport and storage of nuclear fuels or radioactive wastes;

(e) the manufacture, use, storage, disposal and transport of radioisotopes for agricultural, industrial, medical and related scientific and research purposes; and

(f) the use of radioisotopes for power generation in space objects.

Article 2

Notification and Information

In the event of an accident specified in Article 1 (hereinafter referred to as a "nuclear accident"), the State Party referred to in that Article shall:

(a) forthwith notify, directly or through the International Atomic Energy Agency (hereinafter referred to as the "Agency"), those States which are or may be physically affected as specified in Article 1 and the Agency of the nuclear accident, its nature, the time of its occurrence and its exact location where appropriate, and

(b) promptly provide the States referred to in sub-paragraph (a) directly or through the Agency, and the Agency with such available information relevant to minimizing the radiological consequences in those States, as specified in Article 5.

Article 3

Other Nuclear Accidents

With a view to minimizing the radiological consequences, States Parties may notify in the event of nuclear accidents other than those specified in Article 1.

Article 4

Functions of the Agency

The Agency shall:

(a) forthwith inform States Parties, Member States, other States which are, or may be physically affected as specified in Article 1 and relevant international intergovernmental organizations (hereinafter referred to as "international

organizations") of a notification received pursuant to sub-paragraph (a) of Article 2; and

(b) promptly provide any State Party, Member State or relevant international organization, upon request, with the information received pursuant to sub-paragraph (b) of Article 2.

Article 5

Information to be Provided

1. The information to be provided pursuant to sub-paragraph (b) of Article 2 shall comprise the following data as then available to the notifying State Party:

(a) the time, exact location where appropriate, and the nature of the nuclear accident;

(b) the facility or activity involved;

(c) the assumed or established cause and the foreseeable development of the nuclear accident relevant to the transboundary release of the radioactive materials;

(d) the general characteristics of the radioactive release, including, as far as is practicable and appropriate, the nature, probable physical and chemical form and the quantity, composition and effective height of the radioactive release;

(e) information on current and forecast meteorological and hydrological conditions, necessary for forecasting the transboundary release of the radioactive materials;

(f) the results of environmental monitoring relevant to the transboundary release of the radioactive materials;

(g) the offsite protective measures taken or planned; and

(h) the predicted behavior over time of the radioactive release.

2. Such information shall be supplemented at appropriate intervals by further relevant information on the development of the emergency situation, including its foreseeable or actual termination.

3. Information received pursuant to sub-paragraph (b) of Article 2 shall be used without restriction except when such information is provided in confidence by the notifying State Party.

Article 6

Consultations

A State Party providing information pursuant to sub-paragraph (b) of Article 2 shall, as far as is reasonably practicable, respond promptly to a request for further information or consultations sought by an affected State Party with a view to minimizing the radiological consequences in that State.

Article 7

Competent Authorities and Points of Contact

1. Each State Party shall make known to the Agency and to other States Parties, directly or through the Agency, its competent authorities and point of contact responsible for issuing and receiving the notification and information referred to in Article 2. Such points of contact and a focal point within the Agency shall be available continuously.

2. Each State Party shall promptly inform the Agency of any changes that may occur in the information referred to in paragraph 1.

3. The Agency shall maintain an up-to-date list of such national authorities and points of contact as well as points of contact of relevant international organizations and shall provide it to States Parties and Member States and to relevant international organizations.

Article 8

Assistance to States Parties

The Agency shall, in accordance with its Statute and upon a request of a State Party which does not have nuclear activities itself and borders on a State having an active nuclear programme but not Party, conduct investigations into the feasibility and establishment of an appropriate radiation monitoring system in order to facilitate the achievement of the objectives of this Convention.

Article 9

Bilateral and Multilateral Arrangements

In furtherance of their mutual interests, State Parties may consider, where deemed appropriate, the conclusion of bilateral or multilateral arrangements relating to the subject matter of this Convention.

Article 10

Relationship to other International Agreements

This Convention shall not affect the reciprocal rights and obligations of States Parties under existing international agreements which relate to the matters covered by this Convention, or under future international agreements concluded in accordance with the object and purpose of this Convention.

Article 11

Settlement of Disputes

1. In the event of a dispute between States Parties, or between a State Party and the Agency, concerning the interpretation or application of this Convention, the parties to the dispute shall consult with a view to the settlement of the dispute by negotiation or by any other peaceful means of settling disputes acceptable to them.

2. If a dispute of this character between States Parties cannot be settled within one year from the request for consultation pursuant to paragraph 1, it shall, at the request of any party to such dispute, be submitted to arbitration or referred to the International Court of Justice for decision. Where a dispute is submitted to arbitration, if, within six months from the date of the request, the parties to the dispute are unable to agree on the organization of the arbitration, a party may request the President on the International Court of Justice or the Secretary-General of the United Nations to appoint one or more arbitrators. In cases of conflicting requests by the parties to the dispute, the request to the Secretary-General of the United Nations shall have priority.

3. When signing, ratifying, accepting, approving or acceding to this Convention, a State may declare that it does not consider itself bound by either or both of the dispute settlement procedures provided for in paragraph 2. The other States Parties shall not be bound by a dispute settlement procedure provided for in paragraph 2 with respect to a State Party for which such a declaration is in force.

4. A State Party which has made a declaration in accordance with paragraph 3 may at any time withdraw it by notification to the depositary.

Article 12

Entry into Force

1. This Convention shall be open for signature by all States and Namibia, represented by the United Nations council for Namibia, at the Headquarters of the International Atomic Energy Agency in Vienna and at the Headquarters of the United Nations in New York, from 26 September 1986 and 6 October 1986 respectively, until its entry into force or for twelve months, whichever period is longer.

2. A State and Namibia, represented by the United Nations Council for Namibia, may express its consent to be bound by this Convention either by signature, or by deposit of an instrument of ratification, acceptance or approval following signature made subject to ratification, acceptance or approval, or by deposit of an instrument of accession. The instruments of ratification, acceptance, approval or accession shall be deposited with the depositary.

3. This Convention shall enter into force thirty days after consent to be bound has been expressed by three States.

4. For each State expressing consent to be bound by this Convention after its entry into force, this Convention shall enter into force for that State thirty days after the date of expression of consent.

5. (a) This Convention shall be open for accession, as provided for in this Article, by international organizations and regional integration organizations constituted by sovereign States, which have competence in respect of the negotiation, conclusion and application of international agreements in matters covered by this Convention.

(b) In matters within their competence such organizations shall, on their own behalf, exercise the rights and fulfil the obligations which this Convention attributes to States Parties.

(c) When depositing its instrument of accession, such an organization shall communicate to the depositary a declaration indicating the extent of its competence in respect of matters covered by this Convention.

(d) Such an organization shall not hold any vote additional to those of its Member States.

Article 13

Provisional Application

A State may, upon signature or at any later date before this Convention enters into force for it, declare that it will apply this Convention provisionally.

Article 14

Amendments

1. A State Party may propose amendments to this Convention. The proposed amendments shall be submitted to the depositary who shall circulate it immediately to all other States Parties.

2. If a majority of the States Parties requests the depositary to convene a conference to consider the proposed amendments, the depositary shall invite all States Parties to attend such a conference to begin not sooner than thirty days after the invitations are issued. Any amendments adopted at the conference by a two-thirds majority of all States Parties shall be laid down in a protocol which is open to signature in Vienna and New York by all States Parties.

3. The protocol shall enter into force thirty days after consent to be bound has been expressed by three States. For each State expressing consent to be bound by the protocol after its entry into force, the protocol shall enter into force for that State thirty days after the date of expression of consent.

Article 15

Denunciation

1. A State Party may denounce this Convention by written notification to the depositary.

2. Denunciation shall take effect one year following the date on which the notification is received by the depositary.

Article 16

Depositary

1. The Director General of the Agency shall be the depositary of this Convention.

2. The Director General of the Agency shall promptly notify States Parties and all other States of:

(a) each signature of this Convention or any protocol of amendment;

(b) each deposit of an instrument of ratification, acceptance, approval or accession concerning this Convention or any protocol of amendment;

(c) any declaration or withdrawal thereof in accordance with Article 11;

(d) any declaration of provisional application of this Convention in accordance with Article 13;

(e) the entry into force of this Convention and of any amendment thereto; and

(f) any denunciation made under Article 15.

Article 17

Authentic Texts and Certified Copies

The original of this Convention of which the Arabic, Chinese, English, French, Russian and Spanish texts are equally authentic, shall be deposited with the Director General of the International Atomic Energy Agency who shall send certified copies to States Parties and all other States.

IN WITNESS WHEREOF the undersigned being duly authorized have signed this Convention open for signature as provided for in paragraph 1 of Article 12.

ADOPTED by the General Conference of the International Atomic Energy Agency meeting in special session at Vienna on the twenty-sixth day of September one thousand nine hundred and eighty-six.

Declaration on the Part of the United States of America With Respect to the Convention on Early Notification of a Nuclear Accident

As provided for in paragraph 3 of article 11, the United States declares that it does not consider itself bound by either of the dispute settlement procedures provided for in paragraph 2 of that article.

Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency

THE STATES PARTIES TO THIS CONVENTION

AWARE that nuclear activities are being carried out in a number of States.

NOTING that comprehensive measures have been and are being taken to ensure a high level of safety in nuclear activities, aimed at preventing nuclear accidents and minimizing the consequences of any such accident, should it occur.

DESIRING to strengthen further international co-operation in the safe development and use of nuclear energy.

CONVINCED of the need for an international framework which will facilitate the prompt provision of assistance in the event of a nuclear accident or radiological emergency to mitigate its consequences.

NOTING the usefulness of bilateral and multilateral arrangements on mutual assistance in this area.

NOTING the activities of the International Atomic Energy Agency in developing guidelines for mutual emergency assistance arrangements in connection with a nuclear accident or radiological emergency.

HAVE AGREED as follows:

Article 1

General Provisions

1. The States Parties shall cooperate between themselves and with the International Atomic Energy Agency (hereinafter referred to as the "Agency") in accordance with the provisions of this Convention to facilitate prompt assistance in the event of a nuclear accident or radiological emergency to minimize its consequences and to protect life, property and the environment from the effects of radioactive releases.

2. To facilitate such cooperation States Parties my agree on bilateral or multilateral arrangements or, where appropriate, a combination of these, for preventing or minimizing injury and damage which may result in the event of a nuclear accident or radiological emergency.

3. The States Parties request the Agency, acting within the framework of its Statute, to use its best endeavors in accordance with the provisions of this Convention to promote, facilitate and support the cooperation between States Parties provided for in this Convention.

Article 2

Provision of Assistance

1. If a State Party needs assistance in the event of a nuclear accident or radiological emergency whether or not such accident or emergency originates within its territory, jurisdiction or control, it may call for such assistance from any other State Party, directly or through the Agency, and from the Agency, or, where appropriate, from other international intergovernmental organizations (hereinafter referred to as "international organizations').

2. A State Party requesting assistance shall specify the scope and type of assistance required and where practicable, provide the assisting party with such information as may be necessary for that party to determine the extent to which it is able to meet the request. In the event that it is not practicable for the requesting State Party to specify the scope and type of assistance required, the requesting State Party and the assisting party shall, in consultation, decide upon the scope and type of assistance required.

3. Each State Party to which a request for such assistance is directed shall promptly decide and notify the requesting State Party directly or through the Agency whether it is in a position to render the assistance requested and the scope and terms of the assistance that might be rendered.

4. States Parties shall, within the limits of their capabilities, identify and notify the Agency of experts, equipment and materials which could be made available for the provision of assistance to other States Parties in the event of a nuclear accident or radiological emergency as well as the terms, especially financial, under which such assistance could be provided.

5. Any State Party may request assistance relating to medical treatment or temporary relocation into the territory of another State Party of people involved in a nuclear accident or radiological emergency.

6. The Agency shall respond, in accordance with its Statute and as provided for in this Convention, to a requesting State Party's or a Member State's request for assistance in the event of a nuclear accident or radiological emergency by:

(a) making available appropriate resources allocated for this purpose;

(b) transmitting promptly the request to other States and international organizations which, according to the Agency's information, may possess the necessary resources; and

(c) if so requested by the requesting State, coordinating the assistance at the international level which may thus become available.

Article 3

Direction and Control of Assistance

Unless Otherwise Agreed:

(a) the overall direction, control, co-ordination and supervision of the assistance shall be the responsibility within its territory of the requesting State. The assisting party should, where the assistance involves personnel, designate in consultation with the requesting State, the person who should be in charge of and retain immediate operational supervision over the personnel and the equipment provided by it. the designated person should exercise such supervision in cooperation with the appropriate authorities of the requesting State;

(b) the requesting State shall provide, to the extent of its capabilities, local facilities and services for the proper and effective administration of the assistance. It shall also ensure the protection of personnel, equipment and materials brought into its territory by or on behalf of the assisting party for such purpose;

(c) ownership of equipment and materials provided by either party during the periods of assistance shall be unaffected, and their return shall be ensured;

(d) a State Party providing assistance in response to a request under paragraph 5 of Article 2 shall co-ordinate that assistance within its territory.

Article 4

Competent Authorities and Points of Contact

1. Each State Party shall make known to the Agency and to other States Parties, directly or through the Agency, its competent authorities and point of contact authorized to make and receive requests for and to accept offers of assistance. Such points of contact and a focal point within the Agency shall be available continuously.

2. Each State Party shall promptly inform the Agency of any changes that may occur in the information referred to in paragraph 1.

3. The Agency shall regularly and expeditiously provide to States Parties, Member States and relevant international organizations the information referred to in paragraphs 1 and 2.

Article 5

Functions of the Agency

The States Parties request the Agency, in accordance with paragraph 3 of Article 1 and without prejudice to other provisions of this Convention to:

(a) collect and disseminate to States Parties and Member States information concerning:

(i) experts, equipment and materials which could be made available in the event of nuclear accidents or radiological emergencies;

(ii) methodologies, techniques and available results of research relating to response to nuclear accidents or radiological emergencies;

(b) assist a State Party or a Member State when requested in any of the following or other appropriate matters;

(i) preparing both emergency plans in the case of nuclear accidents and radiological emergencies and the appropriate legislation;

(ii) developing appropriate training programmes for personnel to deal with nuclear accidents and radiological emergencies;

(iii) transmitting requests for assistance and relevant information in the event of a nuclear accident or radiological emergency;

(iv) developing appropriate radiation monitoring programmes, procedures and standards;

(v) conducting investigations into the feasibility of establishing appropriate radiation monitoring systems;

(c) make available to a State Party or a Member State requesting assistance in the event of a nuclear accident or radiological emergency appropriate resources

allocated for the purpose of conducting an initial assessment of the accident or emergency;

(d) offer its good offices to the States Parties and Member States in the event of a nuclear accident or radiological emergency;

(e) establish and maintain liaison with relevant international organizations for the purposes of obtaining and exchanging relevant information and data, and make a list of such organizations available to States Parties, Member States and the aforementioned organizations.

Article 6

Confidentiality and Public Statements

1. The requesting State and the assisting party shall protect the confidentiality of any confidential information that becomes available to either of them in connection with the assistance in the event of a nuclear accident or radiological emergency. Such information shall be used exclusively for the purpose of the assistance agreed upon.

2. The assisting party shall make every effort to coordinate with the requesting State before releasing information to the public on the assistance provided in connection with a nuclear accident or radiological emergency.

Article 7

Reimbursement of Costs

1. An assisting party may offer assistance without costs to the requesting State. When considering whether to offer assistance on such a basis, the assisting party shall take into account:

(a) the nature of the nuclear accident or radiological emergency;

(b) the place of origin of the nuclear accident or radiological emergency;

(c) the needs of developing countries;

(d) the particular needs of countries without nuclear facilities; and

(e) any other relevant factors.

2. When assistance is provided wholly or partly on a reimbursement basis, the requesting State shall reimburse the assisting party for the costs incurred for the services rendered by persons or organizations acting on its behalf, and for all expenses in connection with the assistance to the extent that such expenses are not directly defrayed by the requesting State. Unless otherwise agreed, reimbursement shall be provided promptly after the assisting party has presented its request for reimbursement to the requesting State, and in respect of costs other than local costs, shall be freely transferrable.

3. Notwithstanding paragraph 2, the assisting party may at any time waive, or agree to the postponement of, the reimbursement in whole or in part. In considering such waiver or postponement, assisting parties shall give due consideration to the needs of developing countries.

Article 8

Privileges, Immunities and Facilities

1. The requesting State shall afford to personnel of the assisting party and personnel acting on its behalf the necessary privileges, immunities and facilities for the performance of their assistance functions.

2. The requesting State shall afford the following privileges and immunities to personnel of the assisting party or personnel acting on its behalf who have been duly notified to and accepted by the requesting State:

(a) immunity from arrest, detention and legal process, including criminal, civil and administrative jurisdiction, of the requesting State, in respect of acts or omissions in the performance of their duties; and

(b) exemption from taxation, duties or other charges, except those which are normally incorporated in the price of goods or paid for services rendered, in respect of the performance of their assistance functions.

3. The requesting State shall:

(a) afford the assisting party exemption from taxation, duties or other charges on the equipment and property brought into the territory of the requesting State by the assisting party for the purpose of the assistance; and

(b) provide immunity from seizure, attachment or requesting of such equipment and property.

4. The requesting State shall ensure the return of such equipment and property. If requested by the assisting party, the requesting State shall arrange, to the extent it is able to do so, for the necessary decontamination of recoverable equipment involved in the assistance before its return.

5. The requesting State shall facilitate the entry into, stay in and departure from its national territory of personnel notified pursuant to paragraph 2 and of equipment and property involved in the assistance.

6. Nothing in this Article shall require the requesting State to provide its nationals or permanent residents with the privileges and immunities provided for in the foregoing paragraphs.

7. Without prejudice to the privileges and immunities, all beneficiaries enjoying such privileges and immunities under this Article have a duty to respect the laws and regulations of the requesting State. They shall also have the duty not to interfere in the domestic affairs of the requesting State.

8. Noting in this Article shall prejudice rights and obligations with respect to privileges and immunities afforded pursuant to other international agreements or the rules of customary international law.

9. When signing, ratifying, accepting, approving or acceding to the Convention, a State may declare that is does not consider itself bound in whole or in part by paragraphs 2 and 3.

10. A State Party which has made a declaration in accordance with paragraph 9 may at any time withdraw it by notification to the depositary.

Article 9

Transit of Personnel, Equipment, and Property

Each State Party shall, at the request of the requesting State or the assisting party, seek to facilitate the transit through its territory of duly notified personnel, equipment and property involved in the assistance to and from the requesting State.

Article 10

Claims and Compensation

1. The States Parties shall closely cooperate in order to facilitate the settlement of legal proceedings and claims under this Article.

2. Unless otherwise agreed, a requesting State shall in respect of death or of injury to persons, damage to or loss of property, or damage to the environment caused within its territory or other area under its jurisdiction or control in the course of providing the assistance requested:

(a) not bring any legal proceedings against the assisting party or persons or other legal entities acting on its behalf;

(b) assume responsibility for dealing with legal proceedings and claims brought by third parties against the assisting party or against persons or other legal entities acting on its behalf.

(c) hold the assisting party or persons or other legal entities acting on its behalf harmless in respect of legal proceedings and claims referred to in sub-paragraph (b); and

(d) compensate the assisting party or persons or other legal entities acting on its behalf for:

(i) death of or injury to personnel of the assisting party or persons acting on its behalf,

(ii) loss of or damage to non-consumable equipment or materials related to the assistance, except in cases of wilful misconduct by the individuals who caused the death, injury, loss or damage.

3. This Article shall not prevent compensation or indemnity available under any applicable international agreement or national law of any State.

4. Noting in this Article shall require the requesting State to apply paragraph 2 in whole or in part to its nationals or permanent residents.

5. When signing, ratifying accepting, approving or acceding to this Convention, a State may declare:

(a) that it does not consider itself bound in whole or in part by paragraph 2,

(b) that it will not apply paragraph 2 in whole or in part cases of gross negligence by the individuals who caused the death, injury, loss or damage.

6. A State Party which has made a declaration in accordance with paragraph 5 may at any time withdraw it by notification to the depositary.

Article 11

Termination of Assistance

The requesting State or the assisting party may at any time, after appropriate consultations and by notification in writing, request the termination of assistance received or provided under this Convention. Once such a request has been made, the parties involved shall consult with each other to make arrangements for the proper conclusion of the assistance.

Article 12

Relationship to Other International Agreements

This Convention shall not affect the reciprocal rights and obligations of States Parties under existing international agreements which relate to the matters covered by this Convention, or under future international agreements concluded in accordance with the object and purpose of this Convention.

Article 13

Settlement of Disputes

1. In the event of a dispute between States Parties, or between a State Party and the Agency, concerning the interpretation or application of this Convention, the parties to the dispute shall consult with a view to the settlement of the dispute by negotiation or by any other peaceful means of settling disputes acceptable to them.

2. If a dispute of this character between States Parties cannot be settle within one year from the request for consultation pursuant to paragraph 1, it shall, at the request of any party to such dispute, be submitted to arbitration or referred to the International Court of Justice for decision. Where a dispute is submitted to arbitration, if, within six months from the date of the request, the parties to the dispute are unable to agree on the organization of the arbitration, a party may request the President of the International Court of Justice or the Secretary-General of the United Nations to appoint one or more arbitrators. In cases of conflicting requests by the parties to the dispute, the request to the Secretary-General of the United Nations shall have priority.

3. When signing, ratifying, accepting, approving or acceding to this Convention, a State may declare that it does not consider itself bound by either or both of the dispute settlement procedures provided for in paragraph 2. The other States Parties shall not be bound by a

dispute settlement; procedure provided for in paragraph 2 with respect to a State Party for which such a declaration is in force.

4. A State Party which has made a declaration in accordance with paragraph 3 may at any time withdraw it by notification to the depositary.

Article 14

Entry into Force

1. This Convention shall be open for signature by all States and Namibia, represented by the United Nations Council for Namibia, at the Headquarters of the International Atomic Energy Agency in Vienna and at Headquarters of the United Nations in New York, from 26 September 1986 and 6 October 1986 respectively, until its entry into force or for twelve months, whichever period is longer.

2. A State and Namibia, represented by the United Nations Council for Namibia, may express its consent to be bound by this Convention either by signature, or by deposit of an instrument of ratification, acceptance or approval, or by deposit of an instrument of accession. The instruments of ratification, acceptance, approval or accession shall be deposited with the depositary.

3. This Convention shall enter into force thirty days after consent to be bound has been expressed by three States.

4. For each State expressing consent to be bound by this Convention after its entry into force, this Convention shall enter into force for that State thirty days after the date of expression of consent.

5. (a) This Convention shall be open for accession, as provided for in this Article, by international organizations and regional integration organizations constituted by sovereign States, which have competence in respect of the negotiation, conclusion and application of international agreements in matters covered by this Convention.

(b) In matters within their competence such organizations shall, on their own behalf, exercise the rights and fulfil the obligations which this Convention attributes to States Parties.

(c) When depositing its instrument of accession, such an organization shall communicate to the depositary a declaration indicating the extent of its competence in respect of matters covered by this Convention.

(d) Such an organization shall not hold any vote additional to those of its Member States.

Article 15

Provisional Application

A State may, upon signature or any later date before this Convention enters into force for it, declare that it will apply this Convention provisionally.

Article 16

Amendments

1. A State Party may propose amendments to this Convention. The proposed amendment shall be submitted to the depositary who shall circulate it immediately to all other States Parties.

2. If a majority of the States Parties request the depositary to convene a conference to consider the proposed amendments, the depositary shall invite all States Parties to attend such a conference to begin not sooner than thirty days after the invitations are issued. Any amendment adopted at the conference by a two-thirds majority of all States Parties shall be laid down in a protocol which is open to signature in Vienna and New York by all States Parties.

3. The protocol shall enter into force thirty days after consent to be bound has been expressed by three States. For each State expressing consent to be bound by the protocol after its entry into force, the protocol shall enter into force for that State thirty days after the date of expression of consent.

Article 17

Denunciation

1. A State Party may denounce this Convention by written notification to the depositary.

2. Denunciation shall take effect one year following the date on which the notification is received by the depositary.

Article 18

Depositary

1. The Director General of the Agency shall be the depositary of this Convention.

2. The Director General of the Agency shall promptly notify States Parties and all other States of:

(a) each signature of this Convention or any protocol of amendments;

(b) each deposit of an instrument of ratification, acceptance, approval or accession concerning this Convention or any protocol of amendment;

(c) any declaration or withdrawal thereof in accordance with Articles 8, 10 and 13;

(d) any declaration of provisional application of this Convention in accordance with Article 15.

(e) the entry into force of this Convention and of any amendment thereto; and

(f) any denunciation made under Article 17.

Article 19

Authentic Texts and Certified Copies

The original of this Convention, of which the Arabic, Chinese, English, French, Russian and Spanish texts are equally authentic, shall be deposited with the Director General of the International Atomic Energy Agency who shall send certified copies to States Parties and all other States.

IN WITNESS WHEREOF the undersigned, being duly authorized, have signed this Convention, open for signature as provided for in paragraph 1 of Article 14.

ADOPTED by the General Conference of the International Atomic Energy Agency meeting in special session at Vienna on the twenty-sixth day of September one thousand nine hundred and eighty-six.

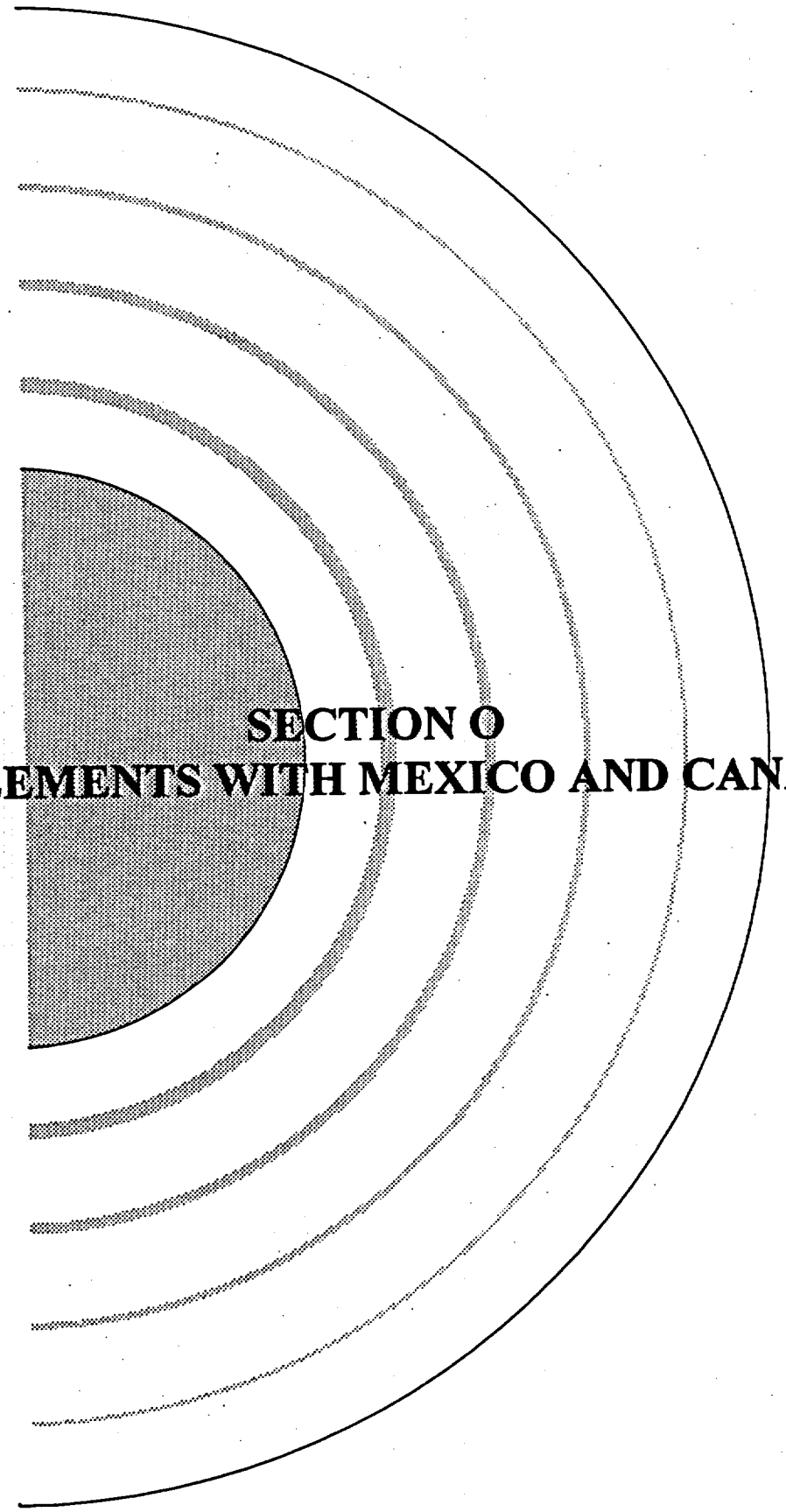
Declaration on the Part of the United States of America With Respect to the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency

In accordance with paragraphs 3 and 4 of article 2 and paragraph 2 of article 7, the United States declares that reimbursement of costs is among the terms of assistance it may provide unless the United States explicitly specifies otherwise or waives reimbursement.

With respect to any other State Party that has declared pursuant to paragraph 9 of article 8 that it does not consider itself bound in whole or in part by paragraph 2 or 3, the United States declares pursuant to paragraph 9 that in its treaty relations with that State the United States does not consider itself bound by paragraphs 2 and 3 to the same extent provided in the declaration of that other State Party.

With respect to any other State Party that has declared pursuant to paragraph 5 of article 10 that it does not consider itself bound in whole or in part by paragraph 2 or that it will not apply paragraph 2 in whole or in part in cases of gross negligence, the United States declares pursuant to paragraph 5 that in its treaty relations with that State the United States does not consider itself bound by paragraph 2 to the same extent as provided in the declaration of that other State Party.

As provided for in paragraph 3 of article 13, the United States declares that it does not consider itself bound by either of the dispute settlement procedures provided for in paragraph 2 of that article.



SECTION O
AGREEMENTS WITH MEXICO AND CANADA

SECTION O
AGREEMENTS WITH MEXICO AND CANADA

AGREEMENTS WITH MEXICO AND CANADA

The following are summaries of the agreements with the Canadian and Mexican Governments as they relate to notifications of events and emergency response.

I. CANADA

The U.S. Nuclear Regulatory Commission (NRC) and the Atomic Energy and Control Board (AECB) of Canada have agreed to the actions below.

A. NRC and AECB will notify each other promptly of any significant radiological event, accident, or emergency that occurs in activities under their respective jurisdictions, and will cooperate by:

1. Establishing and maintaining adequate communications between them for use during such an event, accident or emergency and

2. Subject to certain restrictions, exchanging technical information of the kinds described in this section that relates to such an event, accident, or emergency.

   a. Information related to emergency action levels and emergency response classifications.

   b. Information with respect to emergency planning, regulations, and response organizations.

   c. Information with respect to the nature, location, and expected hazard of a radiological event, accident, or emergency, and with respect to the remedial measures taken or to be taken.

B. Restrictions on the transfer of information fall into two categories

1. NRC and AECB will not disclose technical information, or be obliged to take any other action under this arrangement if that disclosure or action is

   a. Prohibited or inhibited by legislation, Federal government policy or a provision of a contract binding NRC or AECB, or

   b. Technical information related to sensitive nuclear technology as defined in 10 CFR Part 810,

   but they will disclose the prohibition or inhibition and consult about the means, if any, by which the disclosure of such information may be accomplished or the action may be taken consistent with the spirit of the arrangement.

2. Other restrictions and directions apply to the disclosure of proprietary information and these are discussed in Appendix C of the agreement.

C. The NRC and AECB will each appoint an administrator for purposes of this arrangement. NRC and AECB will each notify the other in writing of the name, mailing address, and telephone number of its administrator. The administrator will

1. Establish and maintain an efficient and effective system of communication between NRC and AECB for all purposes of this arrangement;

2. Coordinate the preparation of technical information to be exchanged pursuant to this arrangement;

3. Ensure that the technical information to be exchanged is adequately and appropriately identified with respect to proprietary information;

4. Implement the exchange of technical information contemplated by this arrangement;

5. Where no other person has been identified to receive such information for their respective agency, act as the recipient of technical information received pursuant to this arrangement;

6. Ensure that any conditions or prohibitions on transferring information are respected;

7. Act as coordinators and conveners of such meetings between officials of NRC and AECB as are requested or considered to be necessary;

8. Establish and maintain a list of designated nuclear facilities covered by the agreement;

9. Make recommendations to NRC and AECB with respect to any amendment of this arrangement considered by the administrators to be beneficial to its purpose or it its administration.

II. MEXICO

A. The agreement between the NRC and the Mexican National Commission for Nuclear Safety and Safeguards (CNSNS) contains a section on Emergency Cooperation. To facilitate the initial notification and ensuing emergency communication and/or cooperative activities undertaken, the parties agree:

1. To exchange telephone, facsimile, and telex numbers to be used for emergency communications and to keep these numbers up-to-date;

2. To exchange information related to emergency action levels and emergency response classifications;

3. To exchange information on emergency planning regulations and response organizations;

4. To exchange and update plant- and site-specific information on the Laguna Verde reactor for the NRC and on U.S. facilities as designated by the CNSNS;

5. To advise each other of any changes which would modify the scope, content, or timing of emergency communications; and

6. To test communications capabilities on no less than an annual basis.

Applicable international conventions and national laws, policies, and administrative requirements will govern any activities undertaken following the initial notification with regard to the development and offering of technical advice, the exchange of technical experts, and the provision of equipment or other technical assistance by both parties. Such activities would be decided by the parties on a case-by-case basis.

B. Each party has designated a coordinator for the overall exchange covered by these procedures. Any change in the designation of the coordinators will be promptly communicated to the other party. The coordinators shall be the recipients of all documents transmitted under the exchange, including copies of all letters unless otherwise agreed. Within the terms of the exchange, the coordinators shall be responsible for developing the scope of the exchange, including agreement on the designation of the nuclear energy facilities subject to the exchange, and on specific documents and standards to be exchanged.