

Independent Oversight  
Inspection  
of the

# Radiological Assistance Program

April 2006



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Office of Independent Oversight  
Office of Security and Safety Performance Assurance  
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## Abbreviations Used in This Report

AMS	Aerial Measuring System
ANL	Argonne National Laboratory
ARMS	Asset Readiness Management System
BHSO	DOE Brookhaven Site Office
BN	Bechtel Nevada
BNL	Brookhaven National Laboratory
CH	DOE Chicago Office
CRC	Contractor Response Coordinator
CY	Calendar Year
DOE	U.S. Department of Energy
DHS	Department of Homeland Security
DOE SR	DOE Savannah River Operations Office
EPI	Emergency Public Information
ERO	Emergency Response Officer
FBI	Federal Bureau of Investigation
FRMAC	Federal Radiological Monitoring and Assessment Center
FOG	DOE/NNSA Field Operational Guide
HPGe	High Purity Germanium
HP/SP	Health Physics Survey/Support Personnel
LFA	Lead Federal Agency
NA-40	NNSA Office of Emergency Operations
NA-42	NNSA Office of Emergency Response
NARAC	National Atmospheric Release Advisory Center
NETS	NA-42 Event Tracking System
NNSA	National Nuclear Security Administration

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OVERSIGHT

# 1.0 Introduction

The Secretary of Energy's Office of Independent Oversight, within the Office of Security and Safety Performance Assurance, conducted an inspection of the radiological assistance program (RAP) from November 2005 to January 2006. The purpose of the inspection, performed by the Office of Emergency Management Oversight, was to evaluate the effectiveness of program implementation, with a particular focus on the performance of RAP teams.

The National Nuclear Security Administration (NNSA) Office of Emergency Operations (NA-40) has line management responsibility for the RAP, including overall Headquarters responsibility for programmatic direction, policy guidance, management oversight, performance accountability, and funding. Within NA-40, the Office of Emergency Response (NA-42) is responsible for managing and coordinating day-to-day RAP activities. In order to provide timely response to requests for assistance, the RAP is divided into nine geographical regions, each one managed by a Regional Coordinating Office (RCO) and a Regional Response Coordinator (RRC).

The RAP, established in the late 1950s, is one of the national emergency response assets administered by the U.S. Department of Energy (DOE) and the NNSA. Its mission is to provide first-responder radiological assistance to protect the health and safety of the general public and the environment. Since the terrorist attacks in 2001, RAP team support for the Department of Homeland Security (DHS) and other responsible Federal agencies has expanded to include a diverse array of search and response missions related to potential terrorist incidents involving nuclear or radioactive materials. Teams have been deployed nationally and internationally to provide assistance for events that vary widely in their scope and complexity.

Each RCO is responsible for assigning and maintaining a full-time RRC, who is also the RAP Federal manager for the DOE region. RAP teams are composed of DOE and DOE contractor personnel specifically trained to perform radiological response activities. Each

region is capable of fielding two or more teams of responders, consisting of a Team Leader, Team Captain, and health physics support personnel. The personnel and equipment dispatched to an emergency site are tailored to the initial estimate of the scope and nature of the emergency and are expected to deploy within two hours and arrive at the scene within four to six hours. Following the initial response, the RAP team may be supplemented by additional teams and/or other DOE assets appropriate to the scope and severity of the emergency.

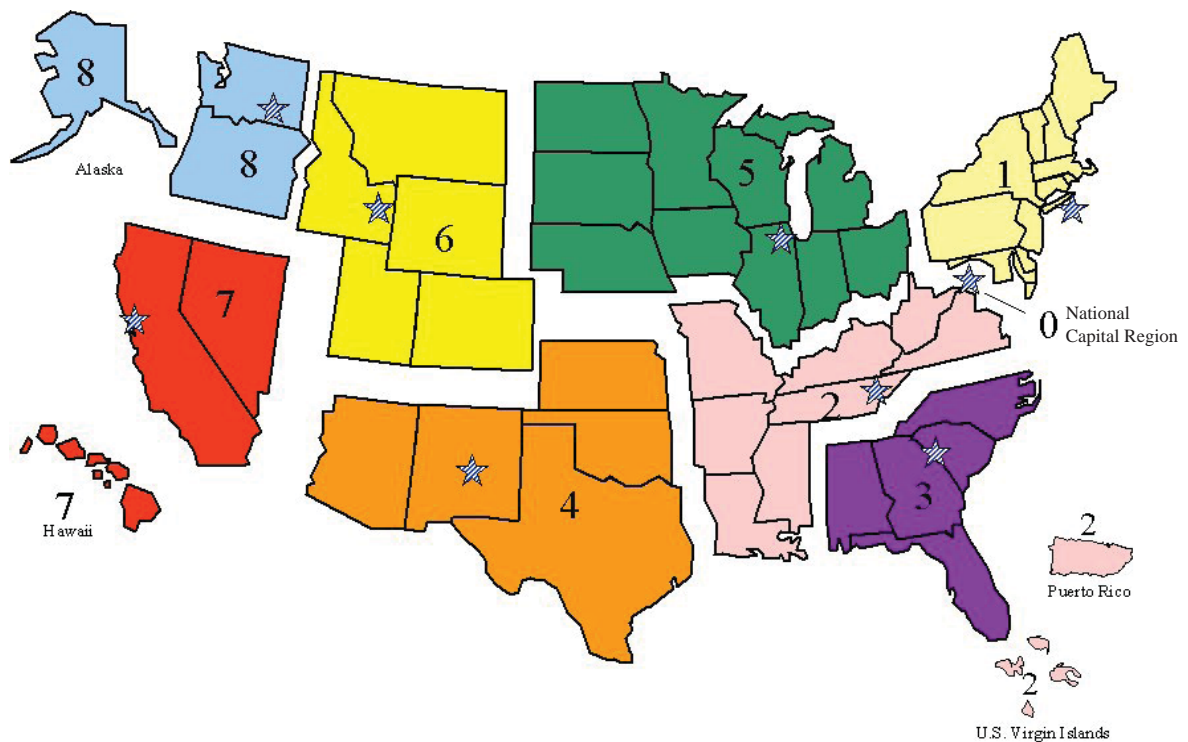
Four of the nine RAP regions were inspected in collaboration with NA-40 to provide a representative cross section of mission experiences and geographical areas, and to explore potential differences in organizational structure and staffing levels. This inspection included onsite evaluations at Region 3, Savannah River Operations Office; Region 1, Brookhaven Site Office; Region 5, Chicago Office; and Region 0, Nevada Site Office's Remote Sensing Laboratory (RSL) located at Andrews Air Force Base. Additionally, program management functions were evaluated at NNSA Headquarters. The inspection included document reviews, observations of facilities and equipment, and interviews with DOE/NNSA Headquarters and RAP regional personnel responsible for program management and implementation. To evaluate the performance of RAP teams in responding to radiological emergencies, the inspection team conducted performance tests that were designed to determine the RAP teams' ability to employ available procedures, data sets, equipment, and skills when responding to postulated emergency conditions.

This report provides results, conclusions, and opportunities for improvement regarding DOE RAP policy and implementation. Section 2 summarizes overall program strengths and weaknesses. Section 3 summarizes results in four emergency management program elements:

- Emergency planning, including plans and procedures and emergency public information (EPI)

- Emergency preparedness, including facilities and equipment, and training, drills, and exercises
- Emergency response, drawing on the results of performance tests conducted at each site
- Readiness assurance.

Section 4 provides conclusions resulting from an analysis of each of these program elements across the regions, as well as how those elements interact to support or limit the overall effectiveness of RAP implementation. Section 5 lists overall opportunities for improvement. Appendix A provides supplemental information, including team composition. Appendix B lists the findings that require corrective action and follow-up. Appendices C through F present the highlights of observations from each region, including region-specific opportunities for improvement.



### Nine DOE Regions and Regional Coordinating Offices

0 Nevada Site Office (Andrews)	5 Chicago Office
1 Brookhaven Site Office	6 Idaho Operations Office
2 Oak Ridge Office	7 Livermore Site Office
3 Savannah River Operations Office	8 Richland Operations Office
4 NNSA Service Center	

## **RAP Regions Selected for Onsite Review**

### **Region 0 - Nevada Site Office (Remote Sensing Laboratory - Andrews)**

Region 0 serves the National Capital Region, which includes the area within the Capital Beltway and the adjacent counties. While the region does not cover a large area, it has a high population density, and many locations of significance. The Region 0 RAP operates from the Remote Sensing Laboratory located on the Andrews Air Force Base, and is run by the Nevada Site Office and its operating contractor, Bechtel Nevada.

### **Region 1 - Brookhaven Site Office**

Region 1 encompasses 11 states: Connecticut, Delaware, Pennsylvania, New Jersey, New York, Maine, Maryland, Massachusetts, New Hampshire, Rhode Island, and Vermont. Within the region are 27 commercial nuclear reactors, as well as research, industrial, and medical facilities that use radioactive material. The Region 1 RAP, located at Brookhaven National Laboratory, is implemented by personnel from the DOE Brookhaven Site Office and its operating contractor, Brookhaven Science Associates.

### **Region 3 - Savannah River Operations Office**

Region 3 encompasses the five-state area of Alabama, Florida, Georgia, North Carolina, and South Carolina, and includes both highly populated urban areas and rural communities. It includes 23 nuclear facilities and many airports and seaports and is traversed by major interstate highway systems and rail lines. Region 3 provides support to several Tribal lands and, through the National Response Team, to the Panama Canal Operating Area. The Region 3 RAP, located at the Savannah River Site, is implemented by personnel from the DOE Savannah River Operations Office and its operating contractor, Washington Savannah River Company.

### **Region 5 - Chicago Office**

Region 5 encompasses ten states: Illinois, Indiana, Iowa, Michigan, Minnesota, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin. Within the region are 19 commercial nuclear reactors, an air force base with land- and air-based nuclear missiles, major border crossing sites, and major shipping and transportation hubs. Located at the Argonne National Laboratory, the Region 5 RAP is implemented by the Chicago Office and Argonne National Laboratory's operating contractor, the University of Chicago.

## 2.0 Results

### 2.1 Positive Program Attributes

The results and conclusions of this report, based on inspections at four RAP regions, are considered representative of the RAP as a whole. During this inspection, RAP teams demonstrated their ability to deploy rapidly and respond effectively to radiological incidents. The most significant positive attributes of the RAP are discussed below.

**The competence, knowledge, and professionalism of the individuals who staff the RAP teams are exemplary.** Throughout the inspection, and particularly during the performance tests, RAP personnel were highly motivated and demonstrated positive attitudes toward their missions and the associated tasks. RAP team members demonstrated a clear understanding of their roles and responsibilities, as described in plans and procedures, and proficiency in applying procedures and training to plan and execute deployments and safely accomplish assigned missions. A thorough knowledge of equipment was evidenced by instrument selection, based on knowledge of instrument capabilities and limitations, and the operation of the equipment in the field. Field monitoring methods were observed to be well practiced and efficient. The level of expertise and professionalism of the RAP team members is a significant strength.

**The RAP training, drill, and exercise programs prepare team members for their specific RAP functions and responsibilities.** Team members receive extensive training through various training providers and settings, including Emergency Operations Training Academy courses and specialized in-house classroom and hands-on training. A database has been implemented that provides a matrix of training requirements for each RAP position, and training and qualifications are tracked effectively. Drills are conducted to train RAP personnel on new policies, procedures, and/or equipment, and RAP teams participate in major exercises with various regional entities. Outreach training activities are commendable and include

Federal, State, city, and local law authorities and emergency response organizations; nuclear power plants; military bases; and the United States Coast Guard.

**Facilities and equipment provide excellent support for current missions, and equipment is appropriately controlled, calibrated, and maintained ready for deployment.** With a few exceptions, equipment is in good condition and maintained in a state of readiness. Equipment staging and storage in close proximity to team spaces and vehicles is a particular strength, resulting in the ability to mobilize rapidly for a variety of mission deployments.

**The Field Operational Guide (FOG) provides a strong foundation for management and implementation of the program.** The FOG establishes standardized guidance for managing the program, promotes uniformity across the RCOs, and establishes the basis for uniform understanding of the RAP mission. The comprehensive program structure specified in the FOG defines the roles and responsibilities of individual RAP personnel, includes a description of all the current RAP missions, and sets expectations for planning and preparedness. The FOG also addresses programmatic elements, such as procedures; training, drills, and exercises; equipment; and readiness assurance.

### 2.2 Program Weaknesses and Items Requiring Attention

The RAP has demonstrated success at providing extensive support to a variety of emergency response and law enforcement agencies for actual incidents involving or potentially involving radiological hazards. However, some weaknesses were noted that diminish the overall effectiveness of the program. Specific weaknesses are discussed below.

**Responsibilities for RAP teams with regard to developing protective action recommendations for consideration by decision-makers are not clearly defined.** RAP policy, as stated in the FOG and Policy Note #7, is to advise local authorities



of appropriate actions during radiological events. Individual RAP regions have different interpretations of their responsibilities for providing protective action recommendations to local authorities, and RAP teams have been provided conflicting statements regarding this function. Observations during the performance tests revealed that some RAP teams are not fully prepared to advise local authorities and decision-makers on protective actions. As a result, this urgent task may be delayed for an extended period of time while awaiting the arrival and operational readiness of the Consequence Management Team or Federal Radiological Monitoring and Assessment Center (FRMAC) personnel.

**The RAP regions that were visited have not fully implemented all of the program elements required by the FOG.** Due to busy operational schedules and extensive training requirements, many program elements remain to be completed. For example, plans and procedures are in various stages of draft development, and none of the regions that were visited has both an approved Management Plan and Response Plan. Self-assessment programs are not fully implemented or not supported by a corrective action tracking system. After-action reports and lessons learned are not completed at all regions and entered into the NA-42 database. Although initial schedules have

been provided for completing many program elements, the schedules have not been updated, and milestones are not actively managed or tracked.

**Implementing procedures governing the conduct of specific missions and detailed, technically accurate operating aids are not always available to effectively support RAP missions.** While each of the inspected regions possesses some combination of procedures, technical manuals, and/or operator aids to assist RAP personnel in startup, checkout, and operation of instruments and equipment, none of the regions has developed a complete set of equipment operating procedures supported by operator aids. Operator aids are utilized by all the RAP teams, but the aids have not consistently been reviewed for technical content or controlled to ensure that the latest approved information is made available. Consequently, the operators may not always follow the most appropriate instructions for startup and operation of the equipment. Additionally, most regions have not prepared a set of procedures with instructions addressing specific missions. For example, there are no procedures governing the expectations for a survey and monitor mission or for a search mission. The lack of procedures results in inconsistencies in performing these missions, as observed during the performance tests, and less than optimal execution of the mission.

## 3.0 Results by Program Area

### 3.1 Emergency Planning

#### Plans and Procedures

DOE Order 5530.3, *Radiological Assistance Program*, establishes RAP roles, responsibilities, and authorities and largely defines the program's purpose and scope. The order also outlines the overall concept of operations governing RAP response and lays out many of the planning and readiness requirements. However, the order is in need of revision to update references, correct roles and responsibilities to reflect the roles of current departmental organizations and the DHS, and address the expanded RAP mission. A commitment made in the February 2003 memorandum of agreement with DHS (governing the national assets program, including RAP) also obligates DOE to review and, if necessary, revise the order. Nevertheless, the shortcomings in the order are at least partially mitigated by the guidance provided in the FOG and NA-40 policy notes, as discussed below.

A significant strength of the RAP, and a contributing factor in alleviating the limitations of the order noted above, is the FOG. The FOG was established to provide standardized guidance for managing the program and to achieve uniformity across the nine RCOs. The FOG provides a strong foundation for management and implementation of the program through a comprehensive framework that defines:

- Roles and responsibilities of individuals by both administrative and operational position
- The types of events for which RAP response is anticipated, including the new DHS support missions
- Development of plans and procedures governing responses, such as the contents of the regional management plan and regional response plan

- Training, drill, and exercise requirements
- Readiness assurance activities
- Equipment to support the RAP missions.

The FOG also enables the widespread RCOs to have a shared strategic view of the program.

RAP policy and expectations are further delineated in a series of policy notes published by NA-40. The policy notes provide direction in areas that are not adequately addressed in the DOE order or FOG, and provide a method for developing and promulgating programmatic guidance in a program operating in a rapidly changing environment. Since the inception of the policy notes in early 2004, NA-40 has promulgated ten notes addressing such topics as budget execution, exercises and training, technology integration, designation of Senior Energy Officials, maritime search policy, and the nuclear assets implementation plan. The notes vary in format, but a number include the roles and responsibilities of individuals for implementing the policy and, in some instances, detailed implementation schedules. Additionally, one note establishes an excellent system for collecting and analyzing performance measures related to the readiness of RAP teams to respond. While the policy notes are an excellent means of providing management direction for the RAP, their effectiveness has been limited by some weaknesses in implementation. For example, not all regions have completed the maritime search training and qualification, nor has a maritime search procedure been prepared and approved for use by all regions, as envisioned in Policy Note #6. Further, a number of the actions in Policy Note #7, which are critical to implementing the strategy for transferring first-response actions to RAP teams, are not being tracked by the RRCs and RAP managers, and this note is not being revised as the strategic direction of the program evolves.



Headquarters policies and plans for national asset deployments, including deployment of RAP teams, are managed by NA-40 and implemented through the Emergency Response Officer (ERO) Manual. The ERO Manual comprehensively addresses the activities of the ERO through a set of general operating instructions that are followed by more detailed instructions for each of the national assets. For example, the manual provides general discussions of response to such events as radiological releases at DOE facilities or activities, and also contains instructions governing first responders and response to terrorist events, either domestic or foreign. The manual also contains sections with specific steps for RAP responses, conduct of search missions, and implementation of the Triage process (analysis of material identity and possible yield potential). While overall the ERO Manual provides strong support to the RAP program, some minor weaknesses were noted. For example, the Triage procedure has not been formally promulgated to the RAP regions for use and, as was observed during the performance tests, RAP personnel do not uniformly implement the process as described in the manual. Also, while Senior Energy Official training prepares RRCs to submit situation reports, the process and procedure for reporting are not clearly described in regional plans and procedures.

In implementing the DOE order requirements regarding plans and procedures, the FOG establishes expectations for development of a Regional Management Plan and a Regional Response Plan, and it contains detailed guidance regarding their format and content. All the regions involved in this assessment have drafted Regional Response Plans (which are meant as outreach documents), but only two have been completed and approved. In the regions with draft response plans, regional personnel have developed short handouts that describe RAP capabilities and the process for obtaining RAP support. Similarly, all regions have drafted Regional Management Plans that address the expectations of the FOG; however, only two of the regions have completed the review and approval process. In all cases, the management plans are sufficiently developed to guide operations at the regional offices. During the assessment, one gap in the integration of the regional management plans was noted. This involves the lack of detailed definition of the geographic and political boundaries associated with the National Capital Region and the jurisdictional and support interfaces among the three regional RAP teams with overlapping responsibilities in this area. This weakness could result in confusion on the part

of requesters and responders (as to which region to contact for support) and less than optimum outreach activities and interfaces between RAP personnel and the supported organizations, such as the Federal Bureau of Investigation.

Although both the DOE order and the FOG establish expectations for development of implementing procedures governing RAP response, neither document sets expectations regarding development or content of specific procedures. The regions involved in this assessment have developed few procedures to address the administrative aspects of the program, such as equipment recall and calibration programs. The RAP community has developed draft plans to provide more detailed instructions regarding training and readiness assurance, but these plans are not yet finalized.

All regions have developed some implementing procedures governing their response activities. These procedures vary somewhat from region to region in both scope and depth. For example, two of the visited regions have developed instructions for each of the primary RAP team positions, while the other two regions have prepared instructions that deal primarily with the general functions of activation and deployment. In addition, one region has developed procedures governing their response to specific missions, such as receipt of foreign fuel shipments and maritime search, and there is a nationwide procedure governing RAP response to events involving shipments of radioactive material by the Office of Secure Transportation. Nevertheless, most regions have not prepared procedures with instructions addressing specific missions. For example, there are no procedures governing the expectations for a survey and monitor mission, such as documentation of survey results, quality control of instrumentation, presentation of results to on-scene decision makers, or potential integration with the larger consequence management teams. For a search mission, there are no procedures that provide information on the capabilities and limitations of the various available search instruments, guidance to the scientist in selecting appropriate instruments and establishing optimum search settings, and search techniques for various types of searches.

Each of the regions has developed procedures and/or operator aids and has provided access to some of the technical manuals to assist RAP personnel in startup, checkout and operation of instruments and equipment. Procedures have typically been prepared for some, but not all, of the newer, more complicated instruments used in search missions. Nearly all equipment operating procedures are designated as

reference procedures; they are utilized for training and support but are not required to be used during equipment operation. Most of the operator aids utilized by the RAP teams are not included in an operator aid program and thus have not been reviewed for technical content or controlled to ensure that the latest approved information is made available to the operators. Consequently, the operators may not always follow the appropriate instructions for startup and operation of the equipment. For example, instructions from the Remote Sensing Laboratory (RSL) and training materials for the Radiological Assistance Program Training for Emergency Response (RAPTER) indicate that one of the search instruments should receive an auto-calibration prior to use and a monthly manual calibration. These instructions are not included in the operator aids provided for the equipment, so appropriate calibrations are not always performed prior to instrument use. As a further example, RSL instructions stipulate the method for performing daily response checks on another search instrument, but these instructions are not always accurately reflected in the RAP procedures and operator aids (or RAPTER training).

**Finding #1: RAP Regional Coordinating Offices have not developed and implemented procedures, checklists, or operator aids necessary to support deployment and execution of specific missions or to direct startup and operation of specialized RAP instrumentation, as required by DOE Order 5530.3, *Radiological Assistance Program*; DOE Order 151.1C, *Comprehensive Emergency Management System*; and the RAP Field Operational Guide.**

Despite these concerns, the significant knowledge, skills, and abilities of RAP personnel, resulting from their training and experience, mitigate a number of the potential effects of the identified shortcomings in procedures.

## Emergency Public Information

As required by DOE Order 151.1C and the FOG, programmatic direction and policy guidance are established for EPI activities by RAP personnel. The FOG identifies roles, responsibilities, and authorities for RAP team members, in particular those who may be expected to interact with media representatives; these include the Team Leader and Public Information Officer (PIO). As specified in the FOG, when deployed with the team, the PIO (in coordination with

Federal, State, Tribal, and local authorities) acts as the primary contact/liaison for public information related to the event. For the most part, RAP regions have incorporated this PIO role into their management and/or response plans and procedures. In addition, during the two performance tests that involved participation of PIOs, the RAP teams satisfactorily demonstrated their ability to respond to EPI demands. Additionally, PIOs had a clear understanding of their roles when responding with a RAP team to an incident where DOE was not the lead Federal agency.

Until May 2005, PIOs were deployed with the RAP teams based on an assessment, by the RRC or Team Leader, of the potential for media and public interest. At that time, NA-42 informed the RRCs through an email message that the office would no longer sponsor PIO attendance in the required RAPTER course, and directed that the PIO be removed from the team composition. The message also indicated that when planning operations in areas with the potential for heavy media coverage, RRCs could contact the ERO, who would further contact the Headquarters PIO for “prompt actions.” However, this policy change did not provide clear guidance on the handling of PIO responsibilities, the future use of site PIOs on RAP teams, or details concerning the budgetary aspects of deploying a site PIO. In addition, NA-42 did not provide guidance regarding the level of support to expect from the Headquarters PIO or the process for obtaining that support. The Senior Energy Official training for RRCs and Team Leaders, sponsored by NA-40, includes spokesperson training. However, it does not include other fundamental EPI activities, such as on-scene management of media actions and effective deterrence of the media from interfering with the RRC’s and Team Leader’s focus on essential public health protective actions. During performance tests, Team Leaders were not fully prepared to assume PIO duties in the absence of a PIO on the team.

The policy change has caused considerable concern within the regions, where experience supports the uniformly held view that the PIOs serve a valuable function on the RAP team by allowing the Team Leader to focus directly on the mission. While there has been little change in the level of PIO support in the short term (resulting chiefly from the strong working relationships between the PIOs and RAP team management), the level of PIO support and expertise can be expected to degrade over time as PIOs with specific expertise in addressing RAP activities and hazards leave the workforce. Further, during a recent RAP deployment, implementation of the new policy

resulted in shortcomings in communications with the public (see the *Type B Accident Investigation of the Americium Contamination Accident at the Sigma Facility, Los Alamos National Laboratory, New Mexico, January 2006*). In the investigation report, the accident investigation board reinforced the concerns about the new policy and stated that “the success or failure of a RAP deployment depends as much on the public’s perception of the event and DOE’s response to them as on the actual facts surrounding the technical and operational response.” The accident investigation board concluded in a judgment of need that NA-40 needs to review lessons learned from this accident for incorporation into its emergency response plans. Corrective actions addressing this judgment of need should clearly address this issue.

## 3.2 Emergency Preparedness

### Facilities and Equipment

Headquarters expectations for the required equipment and instrumentation are provided in the FOG, policy notes (particularly Policy Note #7), and the Asset Readiness Management System (ARMS). A list of the minimum required equipment and instrumentation is provided in Appendix A of the FOG and supplemented by the additional equipment (and acquisition schedule) identified in Policy Note #7. Finally, the expected equipment inventory for use in determining readiness status is specified in the ARMS database. With the growth of RAP missions and technological advances, equipment requirements have evolved continuously over the last several years, and NA-40 manages a technology integration program (see Policy Note #4) to identify mission shortfalls and develop equipment and procedures to address these needs in the most efficient manner possible. During the assessment, one minor weakness was noted in the management of equipment inventory. In a few cases, the equipment requirements in the FOG, policy notes, and ARMS do not match precisely. For example, the equipment inventory in the FOG specifies that each region should have three high-purity germanium (HPGe) detectors (greater than 40 percent), while Policy Note #7 indicates that by the end of fiscal year 2005 each region should have two additional HPGe detectors (100-140 percent). The ARMS database appears to require that the regions have two 40 percent HPGe detectors on hand. These differences may affect

the accuracy of the equipment performance indicator; however, each region involved in this assessment had equipment that enabled the teams to respond effectively during the performance tests.

Facilities and equipment observed at each of the regions are adequate to support current missions, and equipment is nearly always controlled, calibrated, maintained, and readily accessible for deployment. At each of the regions, equipment and supplies are stored in dedicated, adequately controlled storage areas in close proximity to the RAP team spaces. Several of the regions implement periodic checks of the equipment and instrument inventory to ensure that equipment is available and continues to be operable. Overall, instruments were observed to be in excellent condition. Instrument calibration and recall are tracked and documented through a single database or combination of databases; for example, standard health physics instrumentation is included in the contractor’s calibration recall system, and special instruments are tracked in the Emergency Response Data System or ARMS. With very few exceptions, all of the RAP instruments were observed to be appropriately calibrated and marked. In one region, some instruments, though appropriately calibrated or characterized, were not marked with calibration stickers. In two regions, the low-energy survey instruments were not calibrated and ready for operation.

### Training, Drills, and Exercises

NA-40 has line responsibility for establishing training, drill, and exercise guidance for the RAP RCOs and has provided guidance through the FOG and policy notes. The goals and objectives contained in the FOG provide the essential framework for the training, drill, and exercise programs. To provide more detailed guidance, a draft RAP Training Plan for use by each regional RAP organization has been developed and is currently in the review and comment process. In addition, roles, responsibilities, and reporting requirements for exercises are established through planning conferences conducted with the RCOs, and NA-42 performs regional no-notice exercises to evaluate their readiness.

The FOG assigns responsibility to the RRCs to ensure that RAP personnel are qualified (in terms of experience, education, training, and “Q” clearance) and can perform their assigned duties and responsibilities competently. The RRCs maintain team member proficiency by ensuring that drills and exercises

are conducted to identify and evaluate strengths, weaknesses, and deficiencies in emergency response capability, and ensuring that identified weaknesses and deficiencies are corrected. RRCs are also responsible for ensuring that records are kept to enable verification that training, drill, and exercise requirements are met. The Contractor Response Coordinator is assigned responsibility for maintaining an up-to-date status of regional RAP team members' positions, qualifications, and training.

NA-40 maintains awareness of the RAP training program through monthly teleconferences with regional training and outreach coordinators and review of various reports available in the ARMS. This recently implemented, web-based system facilitates standardized reporting by the regions and management review by NA-40; it includes reports of deployable personnel training and qualifications, as well as equipment inventory, status, and maintenance schedules. To facilitate implementation, training on ARMS was provided to the regional RAP contractor staff. The requirements and readiness summary reports from ARMS track and assign readiness ratings to each region based, for example, on the number of trained personnel and operable equipment. However, the ARMS database is based on pending requirements in a draft revision to the FOG. As a result, some personnel whose training meets the current FOG requirements are identified as having training deficiencies in ARMS, and their region has received lower readiness ratings. This has created confusion between NA-40 and the regions in understanding the availability of RAP team members for deployment.

The training, drill, and exercise programs at each region are exemplary and exceed the requirements listed in the FOG. As demonstrated during the performance tests, each RAP region adequately prepares team members for their specific RAP functions and responsibilities. The numerous positive training program attributes include:

- A training matrix identifies each team position, the corresponding competency for the core topics required in the FOG, and additional region-specific training requirements.
- Training/outreach coordinators have included additional training requirements, beyond those listed in ARMS, into facility-specific training tracking systems.

- Team members receive extensive training through various training providers and settings, including Emergency Operations Training Academy courses and specialized in-house classroom and hands-on training.
- Team member qualifications are closely monitored by the training/outreach coordinators to ensure that they remain current and that an accurate duty roster is maintained.

Training drills with specific objectives are conducted to maintain team members' proficiency in instrumentation operations and procedures execution at a frequency that allows team members opportunity to fulfill their annual drill participation requirements. Drills are generally developed based on lessons learned from actual events or exercise evaluations, or to provide training on new or revised procedures and new equipment. Additional opportunities to maintain proficiency are afforded by deployments for actual events or support of other Federal agencies in special events, such as major sporting events, the Presidential inauguration, and spacecraft launches.

RAP team readiness is evaluated in several types of exercises, including annual regional exercises, no-notice exercises administered by NA-42, and those hosted by various regional entities, such as nuclear power plants. The regions use the results of these exercises to identify and implement improvements in their programs.

In addition to RAP team training, each RAP region has a commendable outreach training program that provides training to Federal, State, and local agencies; local fire departments; emergency response organizations; commercial nuclear power plants; military bases; and the United States Coast Guard. The training and outreach coordinators have also conducted training for outside organizations on the transportation emergency preparedness program, radiological emergency preparedness, basic health physics, and response to radiological accidents or incidents.

### 3.3 Emergency Response

NA-40 provides policy and guidance for RAP response to radiological incidents and emergencies, as well as nuclear/radiological weapons and domestic terrorism events, through the FOG and policy notes. The FOG provides a clear mission statement and assigns roles, responsibilities, and authorities for



team members. Independent Oversight conducted performance tests in each visited RAP region to evaluate the adequacy of RAP plans, procedures, equipment, and training in fulfilling program missions. The first phase of the tests involved a mobile search mission for a radiological source, and the second phase involved a survey and monitoring mission in response to a simulated explosion of a radiological dispersal device.

In all the regions, most or all test objectives were satisfactorily achieved, and some areas for improvement were noted. In all cases, RAP team members were observed to be highly motivated individuals who demonstrated well-developed team skills and exceptional capabilities in performing their assigned activities. Upon receiving notification of a radiological incident and proper authorization, RAP teams were promptly activated, mobilized, and deployed. RAP team members clearly understood their roles and responsibilities, and they demonstrated proficiency in applying procedures and training to plan deployments to safely accomplish the assigned missions. Communications and notifications among team members and other response components, such as DOE Headquarters, were thorough and timely throughout the performance tests. Implementing procedures, job aids, and equipment were, with some exceptions, available and used effectively to accomplish mission objectives. The missions were well planned and coordinated to ensure responder safety, and in addition to radiological concerns, other potential hazards were consistently identified and considered. The performance tests demonstrated that RAP teams in each of the regions that were reviewed can plan and safely execute missions of the types tested.

The performance tests did identify two aspects of RAP response that reduced the teams' effectiveness. The first and most significant weakness was in the communication of protective action recommendations to the on-scene decision-maker in a form that is understandable and actionable. Both the FOG and Policy Note #7 include statements that establish RAP as the first responder for radiological assistance, including responsibility for advising local authorities of appropriate actions to mitigate the consequences of the event. For a large-scale event, this function would eventually be assumed by a Consequence Management Team or the FRMAC; however, their arrival at the scene cannot be expected until many hours after the RAP team arrives. Since the effectiveness of protective actions depends largely on the speed with which they are implemented, development and presentation of

protective action recommendations in a usable format is an urgent task. The performance and approach by RAP teams varied with regard to protective action recommendations. Only one of the tested RAP teams quickly evaluated and communicated the adequacy of initial protective actions implemented by the Incident Commander, using a dispersion model of projected consequences; however, this team did not refine the consequence assessment results (the basis for the protective action recommendation) based on actual field monitoring data or record field monitoring data in a format readily usable by the Incident Commander. Another team did not promptly evaluate initial protective actions but was very effective at communicating protective action recommendations. In this case, the team simply drew lines on a National Atmospheric Release Advisory Center (NARAC) deposition plot (overlaid on an area map) indicating areas where, based on Environmental Protection Agency protective action guides, shelter-in-place and evacuation were recommended and explained their rationale to the on-scene decision maker. Two other teams had difficulty in providing the Incident Commander with actionable recommendations based on consequence assessment and protective action guides.

**Finding #2: The roles, responsibilities, and process for providing on-scene decision makers with timely, accurate protective action recommendations to mitigate radiological consequences during the initial stages of an event are not clearly defined, as required by DOE Order 151.1C, *Comprehensive Emergency Management System*, and the National Response Plan.**

The second weakness identified during performance tests was an inconsistent approach when searching for potential radiological dispersal devices. The primary contributor to this weakness is the absence of guidance concerning acceptable levels of risk when responses involve hazards other than those associated with radiological materials, such as explosives. As a consequence, Team Leaders and Team Captains were required to make on-the-spot judgments weighing the safety of RAP personnel against their ability to complete the requested mission. The result was a large variance in the observed responses of the RAP teams in the regions, with responses ranging from refusal to perform the mission unless all risk from explosives was removed, to performance of the mission following establishment of certain safety criteria. This

weakness in mission-specific guidance is addressed more generally by Finding #1.

### 3.4 Readiness Assurance

NA-40 has established the programmatic direction and provided policy guidance for the RAP readiness assurance program through the FOG and a policy note (Policy Note #3, Exercise and Training) for use by the regions in developing and executing region-specific programs. The expectations contained in the FOG provide the essential framework of an effective readiness assurance program by prescribing the development of plans and procedures for the performance of annual self-assessments to ensure that mission plans, procedures, personnel, and equipment are sufficient and readily available. In addition, the FOG assigns responsibility to the RRCs for holding a debriefing following deployment and developing lessons learned for submittal via after-action reports. Policy Note #3 expands on these expectations by establishing a policy for an exercise program that validates RAP assets, verifies that policy is understood and correctly followed, requires documentation of lessons learned, and verifies that identified shortfalls are corrected. Further, the policy establishes the use of the NA-42 Event Tracking System (NETS), a recently introduced central database, to track deficiencies and corrective actions; requires reevaluations for certain types of exercise and drill activities; and establishes the conduct of a formal semi-annual review of lessons learned. Collectively, the NA-40 policy and guidance provide the essential framework for a self-assessment program and feedback and improvement processes.

To provide further direction and coordinating functions, two RRCs are assigned as functional area managers with responsibilities in areas germane to readiness assurance; one is assigned to corrective actions and lessons learned, and the other is assigned to internal assessments. The functional area manager for corrective actions and lessons learned has developed and distributed standard guidance for uploading data into NETS that is conducive to the development of lessons learned. The functional area manager for internal assessments has developed and distributed draft guidance for performing self-assessments to promote a standard approach nationwide. The draft guidance, entitled Readiness Assurance Management Plan for the RAP, appropriately establishes roles and responsibilities, includes planning activities for internal and external assessments, and sets the expectations for

reporting, corrective action plans, and use of NETS. The plan also contains a set of assessment objectives and criteria that cover all essential RAP topical areas, and is soundly based on DOE order requirements and the FOG. Finally, the plan includes a checklist that provides guidance for using the criteria, as well as documentation expectations. However, this plan has not been approved and issued, or otherwise used in its draft state, since it was distributed in August 2005.

NA-40 managers maintain awareness of and foster improvements in the RAP program by conducting periodic teleconferences and videoconferences with RRCs, reviewing RRC monthly status reports, conducting no-notice exercises, and developing lessons learned from RAP operational experience. Semi-monthly teleconferences provide one-on-one time for each RRC with NA-40 managers, while semi-monthly videoconferences provide a forum for periodic meetings with all RRCs to discuss common issues. The RRC monthly reports provide a periodic and standard method for NA-40 to collect data from the regions regarding program status in such areas as deployments, issues, and budget expenditures. The no-notice exercise program provides NA-42 with a method for observing and evaluating the program's state of readiness, encompassing regional and Headquarters activities. During 2005, NA-40 used the information in NETS to develop lessons learned from RAP response experiences and held the inaugural lessons-learned conference. This effort promoted Headquarters involvement in analyzing regional experiences and developing lessons learned on a nationwide level for regional use. A subsequent lessons-learned conference was held in January 2006. This resulted in three major actions: emphasizing use of NETS in the prescribed data format, planning a new approach to lessons learned through use of a Mission Essential Task List, and assigning actions to resolve items currently in NETS to specific RRCs. These actions indicate that the new lessons-learned program is progressively maturing.

Although some effective readiness assurance processes are in place, not all regions are participating and benefiting from program initiatives, and there are instances where Headquarters has not always provided the necessary follow-up to resolve regional issues. For example, one region has not performed self-assessments, and not all regions have provided monthly reports. Some identified weaknesses have remained uncorrected for years, and only one region has a formal corrective action management system that assigns responsibility, establishes due dates, and tracks status.



Additionally, not all regions are populating the central database with their operating experiences or using the existing lessons-learned processes. As a result, RAP readiness assurance requirements and policies are not consistently implemented, and some identified weaknesses have not been corrected. However, for the most part, the longstanding weaknesses that were identified are related to administrative requirements, such as issuing a management plan, rather than to operational concerns, and those weaknesses are reported to result from resource constraints and high operational demands.

**Finding #3: Elements of the RAP readiness assurance program are not fully implemented to assure that plans, implementing procedures, and resources are adequate by ensuring that they are sufficiently maintained, exercised, and evaluated, as required by DOE Order 5530.3, Radiological Assistance Program; DOE Order 151.1C, *Comprehensive Emergency Management System*; and the RAP Field Operational Guide.**

## 4.0 Conclusions

RAP teams support Federal agencies and State, Tribal, and local governments by providing first-response capability to assess radiological hazards and advise decision makers on the steps necessary to protect the health and safety of the general public and the environment. Since September 2001, RAP team support for DHS and other responsible Federal agencies has expanded to include a diverse array of search and response missions related to potential terrorist incidents involving radioactive materials. Overall, this inspection found that the RAP regions are capable of rapidly deploying technically competent, well-equipped teams for assisting in response to radiological incidents. Additionally, NA-40 continues to identify and implement initiatives for program improvements. However, instances were observed that indicate a need for additional policy, guidance, and/or procedures to ensure that the nine RAP regions share a consistent understanding of some of their mission objectives and responsibilities.

NA-40 has established a comprehensive program structure for the RAP that defines expectations for the development and implementation of such elements as procedures; equipment; training, drills, and exercises; EPI; and readiness assurance. NA-40 maintains awareness of and fosters improvements in the RAP program through a variety of methods, including periodic teleconferences and videoconferences with RRCs, monthly status reports, no-notice exercises, and lessons learned. Additionally, databases are used to track and report on indicators of RAP team readiness.

The RAP regions that were visited have facilities and equipment adequate to support current missions, and equipment is nearly always controlled, calibrated, and maintained ready for deployment. The overall training, drill, and exercise program is a strength that has prepared RAP team members for their specific RAP functions and responsibilities. The outreach training program in each region has not only educated Federal, State, and local agencies on the roles of the RAP teams, but has

also resulted in improved communications and working relationships with the customer agencies. RAP teams are composed of skilled, highly motivated individuals capable of competently executing their assigned tasks in fulfilling current mission objectives. In performance tests, team members fulfilled their roles and responsibilities, and demonstrated their proficiency in planning and executing deployments to safely achieve objectives. The competence, knowledge, and professionalism of the individuals who staff the RAP teams are significant strengths that allow the teams to operate effectively in spite of the fact that some important program elements, such as plans, procedures, and self-assessments, have not been fully implemented.

Nevertheless, some weaknesses and performance inconsistencies were noted that can be attributed to incomplete policy guidance and missing procedures. Procedures are often not available to guide RAP response to specific missions or to support consistent operation of instruments from one region to the next. Informal EPI policy changes have caused uncertainty on the part of the RAP regions regarding public information activities during RAP responses and the expected level of support from Headquarters and site public affairs officers. Additionally, many regional RAP administrative elements that are intended to provide for continuous improvement have not been fully implemented, such as lessons-learned reporting and self-assessments.

The most significant observed weakness concerns responsibilities for protective action recommendations based on radiological consequence assessment during the early stages of an event. Although the RAP teams are expected to provide radiological advice to decision makers to protect the public and environment, policies and guidance documents do not provide amplifying instructions for implementing that mission. The mission statement has been interpreted differently among the RAP regions, and there are no regional implementing procedures governing the conduct of specific missions. As a result, not all RAP teams are fully prepared to formulate and recommend

clear, actionable protective actions to an Incident Commander in order to mitigate the consequences of a potential or actual radiological release. Attention is warranted to ensure that policy clearly establishes responsibilities for protective action recommendations for radiological events until the FRMAC is functioning, and to provide guidance for implementing those responsibilities.

Overall, this inspection found that NA-40 has established a strong framework for management and

implementation of the RAP program through the FOG and policy notes. RCOs and RAP teams are composed of skilled, highly motivated individuals who are capable of fulfilling their current missions. Team members enthusiastically executed their tasks and demonstrated proficiency in planning and executing deployments. Nevertheless, the weaknesses identified during this inspection offer opportunities to further improve the capability of the RAP program to perform its increasingly important missions.

## 5.0 Opportunities for Improvement

This inspection identified the following opportunities for improvement. These potential enhancements are not intended to be prescriptive. Rather, they are intended to be reviewed and evaluated by the responsible NNSA and contractor line management and prioritized and modified as appropriate, in accordance with RAP region-specific programmatic objectives.

### Plans and Procedures

- Consider expediting the revision of the DOE order governing the RAP so that the new RAP missions are included in the contractual obligations of the management and operations contractors.
- Consider the following to strengthen the effectiveness of policy notes:
  - Regularly review and revise the policy notes as RAP missions continue to evolve and implementation strategies change.
  - Include the implementation actions contained in the policy notes in the NA-42 action tracking system (or a similar tracking system) and actively manage completion of these actions.
  - Reconcile the ARMS data against other policy documents to ensure that the data being tracked reflects the policy and goals of the overall program.
- Consider promulgating instructions in the ERO Manual that directly affect RAP, such as Triage procedures and submittal of situation reports, in a more formal manner to encourage uniform implementation.
- Consider issuing guidance to clarify the roles, responsibilities, and interfaces among the three RCOs that operate in or are adjacent to the National Capital Region.

### Emergency Public Information

- Consider the following to ensure that policy, plans, procedures, and processes for the use of PIOs during RAP deployments are clear:
  - Clarify expectations regarding the roles and responsibilities of the site PIOs and their expected support to the RAP.
  - Ensure the accuracy of specific, formal policy/guidance contained in the FOG for the use of PIOs by RAP regions; issue a revision if necessary.
  - Formalize the process for obtaining Headquarters public affairs support for RAP teams, and promulgate the process and expectations to the regions. Ensure that the Headquarters EPI plan adequately addresses the mechanisms and processes for providing the necessary support to field-deployed RAP teams.
  - In lieu of RAPTER training, analyze training needs and establish plans to involve PIOs, both site and Headquarters, in sufficient local training, drills, and/or exercises to allow them to support RAP teams effectively.
  - Include sufficient resources in the RAP budget to allow PIO involvement in necessary RAP activities, such as local training, drills, and/or exercises, that may not be included in normal PIO budgets.
- Consider the following to improve the ability of the RRC/Team Leader to respond to public affairs issues regarding RAP missions:
  - Provide guidance to the RRC/Team Leaders in determining whether media interest is considered “significant.”

- Provide guidance and a checklist for the RRC/ Team Leader to use in interacting with the media when they assume the role of Senior Energy Official without PIO support.

## Facilities and Equipment

- Consider the following to improve the tools used to manage and operate RAP equipment and instruments and ensure that all instruments adequately support RAP missions:
  - Validate the equipment performance measures in ARMS against the FOG and policy notes to ensure that performance measures accurately reflect the desired inventories.
  - Emphasize the need to include calibration stickers on all instrumentation, including spectroscopy instruments, to quickly inform operators whether the instrument is within its calibration requirements.
  - Develop, distribute, and implement standard calibration and operation procedures for low-energy survey instruments.

## Training, Drills, and Exercises

- To enhance the tracking of management performance indicators, NA-42 should consider the following:
  - Validate the training requirements identified in the FOG, the RAP Training Plan, and the ARMS database to ensure that they are consistent with one another.
  - Verify that each region clearly understands the minimal required training to determine whether their personnel are fully deployable.

## Emergency Response

- Improve the ability of RAP teams to advise local authorities of appropriate actions to mitigate the consequences of an event based on potential or actual conditions by considering the following actions:

- Revise the FOG to clarify the Team Leader’s responsibility for providing protective action recommendations to the Incident Commander.
- Provide RAP teams with an effective communications capability for obtaining and utilizing NARAC analysis information in the field.
- Make a priority of refining dispersion model results using field monitoring data in order to provide updated protective action recommendations to the Incident Commander.
- Ensure that RAP teams have appropriate tools and methods for streamlining field data collection and presenting assessment results to the Incident Commander.
- Consider issuing guidance to the regions concerning acceptable levels of risk in response to requests for searches involving hazardous materials other than radiological hazards. Incorporate that guidance in the Response Plan and outreach training so that outside authorities are properly informed.

## Readiness Assurance

- Consider the following actions to proactively resolve longstanding issues reported in RRC monthly reports:
  - Review issues in a timely manner, and identify those requiring resolution at the national or Headquarters level.
  - Add the issues and any corrective actions to an issues management database, and assign individuals to be responsible for analysis and resolution.
  - Ensure that implementation schedules are realistic and based on available resources.

- To improve the implementation of the lessons-learned program, consider providing feedback to the RRCs to encourage them to submit their operating experience to NETS for use in lessons-learned development and to allow the regions to make use of lessons learned from other regions.
- Follow through on the current plan to add a validation report to NETS for items that are closed and need to be validated.



## APPENDIX A

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### SUPPLEMENTAL INFORMATION

#### A.1 Dates of Review

Region 3 – Savannah River Operations Office	October 31-November 4, 2005
Region 1 – Brookhaven Site Office	December 12-16, 2005
Region 5 – Chicago Office	January 9-13, 2006
RAP Region 0 – Remote Sensing Laboratory – Andrews	January 23-27, 2006
Report Validation and Closeout	March 17, 2006

#### A.2 Review Team Composition

##### A.2.1 Management

Glenn S. Podonsky, Director, Office of Security and Safety Performance Assurance  
Michael A. Kilpatrick, Deputy Director, Office of Security and Safety Performance Assurance  
Charles B. Lewis, Director, Office of Emergency Management Oversight

##### A.2.2 Quality Review Board

Michael A. Kilpatrick  
Dean C. Hickman  
Robert M. Nelson  
Charles B. Lewis  
Douglas P. Trout  
William T. Sanders

##### A.2.3 Review Team

Jeffrey Robertson (Team Leader)  
JR Dillenback  
Deborah Johnson  
David Odland  
Thomas Rogers  
David Schultz

##### A.2.4 Administrative Support

Marjorie Radey

## APPENDIX B

### PROGRAM FINDINGS

**Table B-1. Program Findings Requiring Corrective Action Plans**

FINDING STATEMENTS	REFER TO PAGES:
1. RAP Regional Coordinating Offices have not developed and implemented procedures, checklists, or operator aids necessary to support deployment and execution of specific missions or to direct startup and operation of specialized RAP instrumentation, as required by DOE Order 5530.3, <i>Radiological Assistance Program</i> ; DOE Order 151.1C, <i>Comprehensive Emergency Management System</i> ; and the RAP Field Operational Guide.	8
2. The roles, responsibilities, and process for providing on-scene decision makers with timely, accurate protective action recommendations to mitigate radiological consequences during the initial stages of an event are not clearly defined, as required by DOE Order 151.1C, <i>Comprehensive Emergency Management System</i> , and the National Response Plan.	11
3. Elements of the RAP readiness assurance program are not fully implemented to assure that plans, implementing procedures, and resources are adequate by ensuring that they are sufficiently maintained, exercised, and evaluated, as required by DOE Order 5530.3, <i>Radiological Assistance Program</i> ; DOE Order 151.1C, <i>Comprehensive Emergency Management System</i> ; and the RAP Field Operational Guide.	13

## APPENDIX C

### RAP REGION 3 – SAVANNAH RIVER OPERATIONS HIGHLIGHTS (October 31 - December 4, 2005)

Region 3 of the U.S. Department of Energy (DOE) radiological assistance program (RAP) encompasses the five-state area of Alabama, Florida, Georgia, North Carolina, and South Carolina, and includes both highly populated urban areas and rural communities. It includes 23 nuclear facilities and many airports and seaports and is traversed by major interstate highway systems and rail lines. Region 3 provides support to several Tribal lands and, through the National Response Team, to the Panama Canal Operating Area.

The Region 3 RAP is implemented by personnel from the DOE Savannah River Operations Office (DOE SR) and its operating contractor, Washington Savannah River Company. The regional program is managed by the DOE/National Nuclear Security Administration (NNSA) RAP regional coordinator, a full-time position, and is supported by three full-time contractor personnel who serve as the contractor response coordinator, equipment coordinator, and training and outreach coordinator. The region provides three fully-staffed, seven-person teams that are on call on a rotating basis. The schedule rotates monthly so that each team is on call every third month. If one RAP team is already deployed, another team is placed on call to be ready to deploy if needed for a second event or to support the team already in the field.

In addition to supporting traditional RAP missions, the Region 3 teams carry out two unique missions: receipt inspection of foreign research reactor spent fuel shipments into the United States, and support for satellite and spacecraft launches that involve radioactive materials. The tempo of operations in Region 3 is relatively high; the RAP regional coordinator, for example, is deployed on mission support activities approximately 55 percent of the time.

#### Emergency Planning

##### Plans and Procedures

Region 3 has an excellent set of recently revised procedures governing the response activities of the four major RAP managers/supervisors: the Regional Response Coordinator (RRC), the Team Leader, the

Team Captain, and the contractor response coordinator. These procedures demonstrate a thorough plan and approach to responding to a request for RAP assistance. In addition, Region 3 has prepared procedures governing specific RAP activities, such as foreign fuel receipt and maritime response, and procedures for operating some of the instruments utilized by RAP team members. For the instruments that do not currently have formal procedures, Region 3 utilizes “quick cards” (informal operator aids) to provide instructions for startup and operation of the instrument. The “quick cards” are available in the RAP Procedures and Forms notebooks that are provided for deployments and in the individual equipment carrying cases, and they are readily usable by team members in the field. However, while the “quick cards” are technically accurate and useful to the team members, they have not been formally reviewed and approved, are not controlled documents, and in one instance did not contain all the necessary technical instructions or information. Region 3 plans to develop further procedures governing other specific activities, such as conducting searches and operating the remainder of the team’s instruments.

The fact that the Region 3 RAP Management Plan is currently in draft form and not all sections are completed has not adversely affected the region’s response capability because the roles, responsibilities, and operational approach are adequately addressed in the RAP implementing procedures discussed above. However, other RAP administrative functions, such as readiness assurance activities, are not currently addressed in underlying procedures. The Region 3 Regional Response Plan provides a good overview of the RAP program in the region, as well as information about the Federal response organization. It also provides adequate, detailed instructions for requesting assistance, along with information about the available assets and the types of available support activities. This plan, which is distributed to outside agencies that need to understand and use RAP, contains some outdated information, such as available assets and expected time to deployment. This information is to be revised during the triennial revision, which was due to be completed in December 2005.

## Emergency Public Information

The DOE/NNSA RAP Region 3 Response Plan and supporting procedures detail emergency public information program support activities for RAP activities as set forth in the DOE/NNSA Field Operational Guide (FOG). In accordance with the FOG, the regional plan and procedures appropriately portray the use of public information officers (PIOs) to serve as the primary contact/liaison to lead Federal agency (LFA), State, Tribal, and local authorities for emergency public information activities related to DOE radiological assistance activities. The RRC or Team Leader serves as the Senior Energy Official, and the Team Leader serves as spokesperson. Recent procedural changes require the RRC and Team Leader to refer all media inquiries or requests for interviews to the on-scene DOE/NNSA PIO, the DOE SR Office of External Affairs, the local PIO, or the LFA. Additionally, the Team Leader is to assume responsibility for reviewing and approving all media briefings or news releases related to DOE/NNSA response operations and to evaluate the need for DOE/NNSA PIO support. As long-serving RAP team members, DOE SR PIOs received the required RAP Training for Emergency Response (RAPTER) training and provided the RRC and Team Leader with essential support, thus allowing the RRC and Team Leader to focus on their mission rather than media pressures and demands. Although PIOs are no longer an official part of the RAP team, because of an NNSA Office of Emergency Response (NA-42) policy change in May 2005, the DOE SR Public Affairs Office expressed its commitment to support to the RAP. However, in light of this policy change, DOE SR Public Affairs also expressed significant concerns regarding the potential lack of support to the Team Leader in public affairs activities, such as responding to media pressures and demands, preparing fact sheets and news releases, and serving as the liaison with other organizations.

## Emergency Preparedness

### Emergency Facilities and Equipment

RAP Region 3 has adequate facilities and equipment to support its current missions, and equipment is appropriately controlled, calibrated, and maintained ready for deployment. Equipment and supplies are stored primarily in the RAP team spaces, where control is readily achievable. However, because

of space limitations, some instruments are stored in the health physics calibration laboratory, somewhat lessening the RAP team's control of the equipment. A walkdown of the facilities and equipment revealed that the equipment is neatly stored and readily available for deployment. Instruments were also observed to be in excellent condition. Instrument calibration recall is tracked and documented through the Emergency Response Data System, and all the instruments that were observed were appropriately calibrated and marked. Instrument calibrations performed on site are conducted using appropriately detailed procedures. Nevertheless, some operational problems during the performance tests were the result of configuration problems, associated primarily with the supporting computer system (see Emergency Response, below).

### Training, Drills, and Exercises

The training, drill, and exercise program for RAP Region 3 adequately prepares team members for their specific RAP functions and responsibilities. The RAP Region 3 training, drill, and exercise program is exemplary and exceeds the requirements listed in the FOG. Numerous positive program attributes were identified. A training matrix for each RAP Region 3 team position has been developed that identifies the competencies for the core topics required by the FOG and identifies additional RAP Region 3 training requirements. Position course templates have been developed, listing both the required courses and recommended courses for each RAP position. Team member qualifications are continuously tracked by the RAP training coordinator to ensure that they do not expire and that an accurate duty roster is maintained. Quarterly training drills with specific objectives were conducted throughout the past year to ensure team members' proficiency in executing procedures and operating instruments. Drills are generally developed based on lessons learned from actual events or exercise evaluations, or to validate new or revised procedures and new equipment. An assembly drill (equipment selection and loading) was also planned for December 2005 to identify where deficiencies exist and to determine how to become more efficient in the assembly process. RAP Region 3-specific exercises are conducted at least once a year; additionally, team members participated in 18 regional or national exercises during 2005. RAP Region 3 has a wide-ranging training and outreach program that includes Region 3 offsite officials and responders, as well as other Federal agencies.

## Emergency Response

Two performance tests were conducted to evaluate the adequacy of RAP plans, procedures, equipment, and training in fulfilling program missions. The first was a mobile search mission for a radiological source, and the second was a response to a simulated explosion of a radiological dispersal device (RDD). Both performance tests were conducted in the field.

All performance test objectives were satisfactorily met. The RAP team was activated promptly, and authorization for deployment was properly confirmed. The RRC and RAP team members clearly understood their roles and responsibilities. They demonstrated proficiency in applying procedures and training to plan deployments to safely accomplish assigned missions, and they deployed on the missions within the FOG-prescribed goal of two hours. Communications and notifications among team members and other response components, such as DOE Headquarters, were thorough and timely throughout the performance tests. Implementing procedures, job aids, and emergency response equipment were available and were used effectively to accomplish mission objectives. The missions were effectively planned and coordinated to ensure responder safety, and hazards in addition to radiological hazards were repeatedly evaluated.

During the first performance test, when notified that the theft of radioactive materials necessitated a RAP response, the RRC requested information that would help plan and prepare for the response, such as shipping papers for the source and Aerial Measuring System data. Utilizing these documents, the RRC performed consequence assessment for potential and actual radiological releases, and effectively utilized the data to monitor and analyze radiological hazards in the field and formulate protective actions for the RAP team and the affected public. National Atmospheric Release Advisory Center (NARAC) dispersion modeling was promptly obtained and used to determine the consequences of a potential release during the RDD search scenario. Following the postulated detonation of the RDD, NARAC consequence calculations were effectively integrated into the process for performing field monitoring and for formulating and recommending protective actions to the LFA.

Search protocols were implemented correctly, and the source location was determined with several different equipment configurations. Triage data was successfully collected and resulted in the correct identification of the radiological source. However,

a few equipment problems caused delays in data gathering and analysis during the search scenario. For example, a computer interface problem was encountered with the high purity germanium detector used to collect the radiological spectrum data for analysis by Triage. Once collected, Triage data was not transmitted from the field due to computer and satellite telephone communications difficulties, and the team had to return to its home base to successfully transmit data via land line.

Field data was used to validate the extent of the contamination modeled by the dispersion calculation. Good command and control of survey teams in the field resulted in safe collection of field data, and field teams used good survey techniques in accordance with applicable protocols. However, field data was not quickly fed back into consequence assessment modeling to refine model results based on actual ground deposition field measurements. Although consequence assessment relies heavily on dispersion modeling, discussions with the RAP team after the performance test indicated that refining consequence assessment modeling may be outside the RAP mission, which team members described as serving as first responders tasked to determine whether contamination exists and what area is affected. Refinement of modeling results is specifically required by team procedures, but a timeline for accomplishing this task is not specified.

Also related to processing of field data, there is a significant potential for decreasing the time needed to provide compiled, readily understandable information for use by customers, such as the Incident Commander or Federal Radiological Monitoring and Assessment Center (FRMAC), by recording data directly onto maps of the area or on the applicable FRMAC form. The RAP team did not consider this feasible due to limitations imposed by field conditions. Notwithstanding this observation, which was of relatively minor consequence for the performance test scenario, the overall effectiveness of field activities provided a technically sound basis for decisions and recommendations to protect emergency responders and the public.

The DOE Team Leader provided current scene information to the (mock) media in a professional manner and promised and provided follow-up information during the RDD scenario. However, the Team Leader did not refer media to the DOE SR public affairs office for further information as required by procedure and was not fully prepared to assume PIO duties in the absence of a PIO on the team.



## Readiness Assurance

The RAP Region 3 program elements undergo periodic annual self-assessments, and an additional feedback and improvement process is implemented through after-action reports developed for RAP drills, exercises, and actual deployments. The self-assessments use appropriate evaluation criteria (Emergency Deployment Readiness Evaluation criteria), while the feedback and improvement process uses an acceptable critique/hotwash process to identify lessons learned. Lessons-learned items are loaded into the recently implemented NA-42 Event Tracking System for later use by all regions and to promote corrective action implementation. Deficiencies identified during self-assessments are not tracked in a database, but there are few of them and their status is known by the owner and reported in monthly management reports to the NNSA Office of Emergency Operations (NA-40). Neither the self-assessment nor the feedback and improvement process incorporates root cause analysis. In addition, two repeat findings dating back to 2003 remain uncorrected. One of these items includes the development of a Region 3 RAP Management Plan, which is in draft form and is, among other things, intended to define the RAP readiness assurance program. Although the RAP self-assessments and feedback and improvement elements continue to enhance the RAP program, they rely on the institutional memory of assigned personnel because the processes are not documented.

## Opportunities for Improvement

This inspection identified the following opportunities for improvement. These potential enhancements are not intended to be prescriptive. Rather, they are intended to be reviewed and evaluated by the responsible NNSA and contractor line management and prioritized and modified as appropriate, in accordance with RAP region-specific programmatic objectives.

## Plans and Procedures

- Consider implementing an operator aid procedure and/or program to improve the technical accuracy of the aids:
  - Control the preparation, review, approval, and distribution of “quick cards.”
  - Provide operator aids in support of existing procedures.

## Emergency Facilities and Equipment

- Consider implementing a process or procedure to maintain configuration control of the RAP support computers, including:
  - Controls to verify that equipment requiring computer software support is not deployed until the computer is properly configured
  - Periodic verification of the computer software configuration and ability to function with supported equipment.

## Readiness Assurance

- To improve the timeliness of corrective actions, consider the following actions:
  - Identify the root cause for overdue corrective actions, and establish specific actions to promote timely completion.
  - Improve accountability and clearly communicate responsibility for action items by identifying assigned personnel, especially when more than one person/organization has to take action.



## APPENDIX D

### RAP REGION 1 – BROOKHAVEN SITE OFFICE HIGHLIGHTS

(December 12 - 16, 2005)

Region 1 of the U.S. Department of Energy (DOE) radiological assistance program (RAP) encompasses eleven states: Connecticut, Delaware, Pennsylvania, New Jersey, New York, Maine, Maryland, Massachusetts, New Hampshire, Rhode Island, and Vermont. Within the region are 27 commercial nuclear reactors, as well as research, industrial, and medical facilities that use radioactive material.

The Region 1 RAP, located at Brookhaven National Laboratory (BNL), is implemented by personnel from the DOE Brookhaven Site Office (BHSO) and its operating contractor, Brookhaven Science Associates. Regional program operations are managed by the DOE/National Nuclear Security Administration (NNSA) RAP Regional Response Coordinator (RRC), a full-time position, who is supported by three full-time contractor personnel who serve as the contractor response coordinator (CRC), the equipment coordinator, and the training and outreach coordinator. Additionally, a full-time equipment technician has been assigned on a temporary basis. When RAP teams are deployed, Region 1 team members are chosen from a pool of personnel based on availability, laboratory work priorities, and skill set.

In addition to supporting traditional RAP missions, Region 1 provides extensive support to the Joint Terrorism Task Force. Two-man teams are deployed weekly, and deployments of full teams for a week or more are not uncommon.

## Emergency Planning

### Plans and Procedures

Region 1 has recently prepared a comprehensive management plan that describes the roles, responsibilities, and processes governing the RAP, including both program management and response to requests for assistance. The management plan is currently being revised to reflect lessons learned and recent changes in the RAP management structure. The management plan is supported by a set of procedures governing the response activities of the RAP personnel, including, for example, the Team Captain, equipment

manager, field team supervisor, and field team members. The current Team Leader procedure does not appropriately implement the management plan; however, the procedure is being revised and will be implemented early in calendar year 2006. Additionally, there are no procedures governing RRC or CRC response activities, and no procedures governing the administrative functions and responsibilities of the RAP staff.

Region 1 has developed appropriately detailed procedures for operating instruments, such as the gamma spectroscopy system, that are used infrequently and/or entail complicated operational instructions. For instruments that do not currently have formal procedures, Region 1 uses a set of informal operator aids to provide instructions for startup and operation. The procedures and operator aids are available in the RAP procedure notebooks that teams take along on deployments, and they are readily usable by team members in the field. Although the operator aids are generally accurate and useful to the team members, they sometimes differ from published guidance. For example, the mode and method of performing the daily operability check of the linear radiation monitor specified in the operator aid differs from that contained in the Radiation Safety Laboratory training materials. Further, the operator aids are not formally reviewed and approved, and they are not controlled documents.

Region 1 does not have procedures governing specific response activities, such as conducting searches, maritime response, or response to transportation accidents.

### Emergency Public Information

DOE/NNSA RAP Region 1 Management and Response Plans and most procedures detail the emergency public information program support activities for RAP activities as set forth in the DOE/NNSA Field Operational Guide (FOG). In accordance with the FOG, the regional plan and procedures appropriately address the use of public information officers (PIOs) to serve as the primary contact/liaison to lead Federal agency (LFA), State, Tribal, and local authorities for emergency public information activities

related to DOE radiological assistance activities. The procedures require team members to direct questions from the public and media to the Team Leader or PIO. As long-serving RAP team members, DOE BHSO PIOs received the required RAP Training for Emergency Response (RAPTER) training and provided the RRC and Team Leader with essential support, thus allowing the RRC and Team Leader to focus on their mission rather than media pressures and demands. Although PIOs are no longer an official part of the RAP team, based on an NNSA Office of Emergency Response (NA-42) policy change in May 2005, BHSO management indicated that supporting the RAP teams would be the highest priority for public affairs personnel. However, in light of this policy change, both RAP and BHSO Public Affairs Office personnel expressed how important it was for a PIO to know and understand the overall RAP mission, the specifics of each deployment, and the potential ensuing media exposure and issues.

## Emergency Preparedness

### Emergency Facilities and Equipment

Facilities and equipment are adequate to support current missions, and equipment is appropriately controlled, calibrated, and maintained ready for deployment. Equipment and supplies are adequately controlled and are stored in a dedicated storage area that is in close proximity to the RAP team spaces. A walkdown of the facilities and equipment revealed that the equipment is neatly stored and readily available for deployment. Overall, instruments were observed to be in excellent condition. Instrument calibration recall is tracked and documented using a database, and all the instruments that were observed were appropriately calibrated and marked. Instrument calibrations performed on site are conducted using appropriately detailed procedures. Despite these positive attributes, Region 1 does not possess all of the equipment that is currently designated for its use in the FOG or the Radiological Assistance Program Budget and Implementation Policy for the National Assets Implementation Plan (Policy Note #7). Additionally, the vehicles that are available to support the Region 1 RAP team are not configured to effectively support the equipment and personnel for the full RAP mission. General Services Administration fleet restrictions limit the purchase of more appropriate vehicles, such as sport utility vehicles.

## Training, Drills, and Exercises

The training, drill, and exercise program for RAP Region 1 adequately prepares team members for their specific RAP functions and responsibilities. Training on the Asset Readiness Management System (ARMS) training database was given to BNL RAP contractor staff on November 8, 2005. A training matrix for each RAP Region 1 team position is available through ARMS, identifying the competencies for the core topics required by the FOG. The RAP Region 1 training and outreach coordinator has added training requirements to the BNL job training analysis tracking system for each RAP position. Team member qualifications are closely monitored by the training and outreach coordinator. Currently, approximately half the health physicist support personnel and half the Team Captains need to complete RAPTER training in order to be fully qualified, and three others are awaiting security clearance. These individuals are deployed on RAP responses but are limited to support roles for some types of missions. It should be noted that RAPTER training requirements have not been fulfilled because many RAP members were deployed when they were scheduled to receive the training; most of those who lack RAPTER training were scheduled to attend in January 2006. A nationwide draft RAP Training Plan, dated October 25, 2004, has been proposed for use by each RAP region but has not been implemented or approved by the NNSA Office of Emergency Operations (NA-40).

RAP Region 1 has a noteworthy training and outreach program for the 11 states, 27 commercial nuclear power plants, and Federal emergency preparedness organizations under their responsibility. The training and outreach coordinator conducts training on the transportation emergency preparedness program, radiological emergency preparedness, basic health physics, and response to radiological accidents or incidents for these entities.

Drills are conducted to train RAP personnel on new policies, procedures, and/or equipment. Drill credit is also given to the team members for their deployment activities. Annual exercises are conducted with one of the Region 1 states and/or one of the commercial nuclear reactor facilities.

## Emergency Response

A performance test was conducted to evaluate the adequacy of RAP plans, procedures, equipment,

and training in fulfilling program missions. Phase 1 of the performance test was a mobile search mission for a radiological source, with a follow-on Phase 2 involving a response to a simulated explosion of a radiological dispersal device (RDD). All activities, except transmittal of Triage data, were performed in the field.

Most performance test objectives were met satisfactorily. During Phase 1 of the performance test, when first notified of the theft of radioactive materials that might necessitate a RAP response, the RRC and CRC requested information that would help them plan and prepare for a response, such as shipping papers and Aerial Measuring System data. Upon request by the Headquarters Emergency Response Officer, the RAP team was promptly activated, and authorization for deployment was properly confirmed. Information was coordinated with the appropriate Federal and local authorities, and notifications to site DOE and Brookhaven management were made promptly. Communications and notifications among team members and other response components, such as DOE Headquarters, were generally thorough and timely throughout the performance test, except as noted below. RAP team members clearly understood their roles and responsibilities as described in plans and procedures, and they demonstrated proficiency in applying procedures and training to plan deployments to safely accomplish assigned missions.

Mission planning provided the basis for equipping the team and identifying hazards to ensure the safety of team members. A mission planning checklist was used to identify the required equipment and hazards and establish turn-back limits. The safety of team members was factored into all planning and direction from the RRC and CRC, as were the health and safety of BNL workers. However, the initial briefings to RAP team management and members were conducted piecemeal, rather than briefing all the appropriate people at the same time. For example, the Team Leader and Team Captain were directed to write a mission plan while the team was being briefed, resulting in lapses in communicating some important items, such as equipment requirements, among team management and team members. Team managers had a good discussion of the security issues involved in the search, and they determined that the searchers should use vans (and not stop or get out to investigate) to conduct the search safely. The teams were deployed on their missions within the prescribed FOG goal of two hours. However, without controller intervention, an unwritten team policy of not approaching a target

vehicle (i.e., one suspected to contain explosives) closer than the blast exclusion zone would have prevented the team from completing a mission task of source characterization. DOE/NNSA has not issued guidance or policy on this subject.

National Atmospheric Release Advisory Center (NARAC) dispersion modeling was not used to determine the consequences of a potential release from an RDD when source term information was first available, and determinations regarding the adequacy of protective actions initially established by the LFA were not performed until well into the event. HotSpot and NARAC consequence calculations were not initiated until approximately an hour and a half after the necessary calculational input data was available. When development of protective action recommendations for use by the LFA, State, and county became a priority, the NARAC output data used for this purpose was not thoroughly understood by team managers. The inspection team noted that RAP Region 1 mission objectives include “evaluation of radiological incidents” and “protect public health and safety,” but only the Team Captain is given responsibility, by procedure, for “interpreting the results and making recommendations for actions to mitigate radiological consequences.”

Search protocols were implemented correctly but, due to the weakness of the source and through no fault of the RAP team, the source location was not actually determined. Triage data was successfully collected and resulted in the correct identification of the radiological source. The CRC called the Headquarters watch office to inform the actual (not simulated) Emergency Response Officer (ERO) at NA-40 that Triage support would be needed, as required by the Triage procedure. No callback was received from the ERO, and after 15 minutes the decision was made to transmit data to Triage without ERO coordination.

Characterization of field deposition to identify the outer boundaries of the plume was well planned. Field teams effectively executed their assignments by utilizing their work instructions and job aids and by ensuring the operability of their radiological monitoring equipment. Field data was recorded using latitude and longitude, but the available maps contained only geographical and political boundaries, making presentation of data difficult. Although the applicable procedure indicated that the teams would use a site form for recording survey data and the forms were present in the field kits, the forms were not used. Finally, the RRC and CRC were prepared to quickly feed field data

back into consequence assessment modeling to refine model results based on actual ground deposition field measurements, but the performance test was concluded before this action was actually accomplished.

The RRC promptly activated an experienced PIO, who was appropriately briefed and immediately executed his responsibilities. A draft news release was prepared within an hour and properly referred to the LFA by the RRC for concurrence. Subsequent PIO activities were timely, appropriate, and supportive of the RRC's and LFA's needs.

## Readiness Assurance

The RAP Region 1 Management Plan, consistent with the FOG, provides a good framework for the readiness assurance program. It requires annual self-assessments, a complete review of all elements over a three-year period, the development and tracking of corrective actions, follow-up evaluations, periodic external assessments, and development and tracking of lessons learned from drills and callouts. As prescribed by these documents, the CRC has tracked and closed out action items identified during some deployments, but most of the prescribed readiness assurance program activities have not been implemented. No annual self-assessments have been performed, and Region 1 has not provided data input to the NA-42 event tracking system for use in developing lessons learned from Region 1 experience. Furthermore, Region 1 has not benefited from the NA-40 lessons-learned effort by using the information provided by other regions. External reviews of the Region 1 RAP program by the BNL oversight organization reported in 2002, and again in a 2003 follow-up inspection, that annual self-assessments had not been performed for the Region 1 RAP program. However, RAP self-assessments were again not performed in the two years after the Brookhaven oversight reviews. Because of the absence of readiness assurance reviews, there has been no formal identification of issues in a process that assigns responsible personnel and establishes a schedule for managing corrective action implementation for program improvement.

## Opportunities for Improvement

This inspection identified the following opportunities for improvement. These potential enhancements are not intended to be prescriptive. Rather, they are intended to be reviewed and

evaluated by the responsible NNSA and contractor line management and prioritized and modified as appropriate, in accordance with RAP region-specific programmatic objectives.

## Plans and Procedures

- Consider implementing an operator aid procedure and/or program to:
  - Control the preparation, review, approval, and distribution of operator aids.
  - Verify the technical accuracy of the operator aids.
  - Provide operator aids in support of existing procedures.
- Evaluate the need for and, where appropriate, develop the following additional procedures and/or checklists:
  - Response procedures and/or checklists for the RRC and CRC
  - Administrative procedures for important administrative program elements, such as routine equipment inventory/maintenance or self-assessments
  - Mission-specific response procedures.

## Emergency Response

- Consider the following actions to improve the teams' ability to collect and present field monitoring data in a timely manner:
  - Record field monitoring data directly onto a survey form, such as the site or Federal Radiological Monitoring and Assessment Center forms.
  - Record field monitoring data using the same maps and reference system as the Team Leader and Team Captain, either latitude and longitude or geographic landmarks, so that data can be quickly transcribed for interpretation and presentation.



- Evaluate and procure the tools needed to record and present field data, such as computer-aided maps.
- To improve the teams’ ability to provide protective action recommendations to decision makers, consider the following actions:
  - Revise plans and procedures to clarify the roles and responsibilities of RAP team managers in evaluating radiological incidents for actual or potential impact on public health and safety and making recommendations to appropriate authorities to mitigate such consequences.
  - Conduct training to improve RAP team management’s familiarity with interpreting the NARAC plots and data associated with protective actions.
  - Develop a plan and associated method of presentation for providing the recommendations to decision makers.
- Consider conducting formalized briefings for all team members to ensure thorough knowledge of the mission and accurate understanding of expected team member actions.

## Readiness Assurance

- Consider the following in establishing an effective Region 1 self-assessment program:
  - Define all program elements and establish annual schedules to ensure that all areas are covered within the expected three-year period.
  - Develop assessment criteria tailored to Region 1 missions from the criteria prescribed in the FOG.
  - Implement the RAP standardized internal assessment program.
- Consider the following to improve the lessons-learned program:
  - Establish written protocols for the Region 1 RAP lessons-learned processes. In doing so, establish a mechanism for developing lessons learned after each RAP drill or deployment.
  - Become active in submitting Region 1 lessons learned to the NA-42 event tracking system.
  - Make use of the lessons learned developed by NA-40 from region-wide experience, and apply them to the regional program.



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## APPENDIX E

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### RAP REGION 5 – CHICAGO OFFICE HIGHLIGHTS

(January 9 - 13, 2006)

Region 5 of the U.S. Department of Energy (DOE) radiological assistance program (RAP) encompasses ten states: Illinois, Indiana, Iowa, Michigan, Minnesota, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin. Within the region are 19 commercial nuclear reactors, an air force base with a nuclear missile wing, major border crossing sites, and major shipping and transportation hubs.

The Region 5 RAP, located at Argonne National Laboratory (ANL), is implemented by personnel from the DOE Chicago Office (CH) and ANL's operating contractor, the University of Chicago. Regional program operations are managed by the DOE/National Nuclear Security Administration (NNSA) RAP Regional Response Coordinator (RRC), a full-time position, who is supported by five full-time contractor personnel who serve as the contractor response coordinator (CRC), the equipment coordinator, the training and outreach coordinator, the chief technician, and the administrative assistant. When RAP teams are deployed, Region 5 team members are chosen from a pool of personnel based on availability, laboratory work priorities, and skill set.

In addition to supporting traditional RAP activities through outreach and preparedness activities, Region 5 has established close working relationships with local communities, law enforcement agencies, and regional response organizations. The RAP team has been involved in a number of activities, resulting in a high operational tempo; these include participation in a number of training activities and exercises, extensive support to Joint Hazards Assessment Teams for special events—14 special events in calendar year (CY) 2005—and actual responses.

### Emergency Planning

#### Plans and Procedures

Region 5 has prepared a management plan that comprehensively addresses the expectations of the Field Operational Guide (FOG), with one exception noted under Readiness Assurance, below.

It describes RAP roles, responsibilities, and processes, including both program management and response to requests for assistance. The management plan and team composition reflect the expanded nine-member RAP team and include personnel, such as a scientist and communications specialist, to support extended RAP missions. The region's approved Regional Response Plan is out of date, and although a detailed revision has been drafted, it has not yet been reviewed and approved. In the interim, regional personnel have prepared a one-page description of the RAP mission and response processes for distribution that provides adequate information for potential requestors until the revised plan is available.

The RAP management plan is supported by a procedure governing the notification and activation activities of RAP personnel. In addition, a procedure that governs the RAP team's activities in support of field team monitoring and sampling, including such activities as plume surveys and air sampling, has been developed and implemented. Regional personnel are drafting a procedure to address deployment activities and plan to develop further implementing procedures. However, procedures have not been prepared to address response activities for specific RAP team positions, such as the Team Leader, Team Captain, or scientist, or to address mission-specific responses, such as searches or maritime response. Additionally, there are no procedures governing the administrative functions and responsibilities of the RAP staff.

Region 5 has not prepared detailed procedures for operating equipment and instrumentation that is used infrequently and/or requires complicated operational instructions. In lieu of formal procedures, the region utilizes a set of informal operator aids in combination with the applicable technical manuals to provide instructions for startup and operation of the instruments. The operator aids and manuals are available in close proximity to the equipment for use by the teams during activation and deployment, and they are usable by team members. However, while the operator aids are generally accurate and useful, they have not been formally reviewed and approved, are not controlled documents, and may not contain the detail necessary to ensure proper operation. For

example, the linear range monitor instructions may not be sufficiently detailed to ensure that this monitor is source-checked for the desired operating mode.

As observed during the performance test, the RAP team is staffed by experienced, capable team members who understand their individual roles and responsibilities, and they effectively prepare and operate the instrumentation to accomplish the mission. Consequently, the shortage of implementing procedures and checklists has not adversely affected the region's response capability.

## Emergency Public Information

The DOE/NNSA RAP Region 5 Management Plan and draft Response Plan outline emergency public information program support activities for RAP activities as set forth in the DOE/NNSA Field Operational Guide (FOG). In accordance with the FOG, the regional plan and procedures appropriately address the use of public information officers (PIOs) to serve as the primary contact/liason to lead Federal agency (LFA), State, Tribal, and local authorities for emergency public information activities related to DOE radiological assistance activities. Moreover, the extensive training and experience of the CH PIOs provide the RRC/Team Leader with essential support, thus allowing the RRC/Team Leader to focus on the mission rather than media pressures and demands. However, while past team training required team members to refer all media inquiries to the RAP PIO, plans and procedures do not provide any direction to team members for interfacing with the media, such as "direct questions from the public and the media to the DOE Team Leader or the PIO unless otherwise authorized by the DOE Team Leader." Though PIOs are no longer an official part of the RAP team, based on an NNSA Office of Emergency Response (NA-42) policy change in May 2005, the PIOs and CH management expressed their commitment of support to the RAP. In addition, however, CH management expressed significant concern with respect to the lack of policy from the NNSA Office of Emergency Operations (NA-40) regarding PIO roles and responsibilities in support of the RAP, the expected level of that support, and associated budgetary issues related to that support.

## Emergency Preparedness

### Emergency Facilities and Equipment

Equipment staging, combined with the number and types of vehicles available to support RAP functions, is a particular strength. Region 5 has a variety of available support vehicles, ranging from mini-vans to trucks, that are co-located with the equipment in a combined garage and storage facility. This arrangement allows ready access to the vehicles during mobilization activities, such as equipment checkout and loading. Vehicles are configured with dedicated storage bins that are pre-loaded with the equipment, references, personal protective equipment, and consumables necessary to support deployment. Much of the equipment is pre-loaded in hard carrying cases or pre-mounted in the support vehicles. The overall result is that the team is able to mobilize rapidly for a given deployment. Additionally, the team has developed a memorandum of agreement with the Coast Guard that provides for the rapid deployment of two personnel and a limited amount of equipment by helicopter when necessary.

Facilities and equipment provide excellent support for current missions. Equipment is appropriately controlled, calibrated, and maintained, and equipment and supplies are stored in dedicated storage areas that are adequately controlled. A walkdown of the facilities and equipment revealed that the equipment is properly stored and readily available for deployment, and some equipment is pre-staged in vehicles to facilitate activation and deployment. Notwithstanding the above, Region 5 does not possess a few pieces of equipment (for example, satellite telephones) that are currently designated for its use in Policy Note #7 and the FOG.

Equipment inventory is tracked using a database spreadsheet, and instruments are operationally checked periodically through an informal process to ensure that they are ready for deployment. Calibration recall of radiological instrumentation is tracked and documented through the site's instrument database, and nearly all the instruments that were observed were appropriately calibrated and marked. Search instrumentation is calibrated by offsite organizations, such as the Remote Sensing Laboratory (RSL) or the equipment vendor, and in some cases (for example, the Exploraniums™) may not be included in a recall system. Overall, instruments were observed to be in excellent condition.

## Training, Drills, and Exercises

The training, drill, and exercise program for the Region 5 RAP adequately prepares team members for their specific RAP functions and responsibilities. Team members receive required training through various venues: the ANL Training Department, the Emergency Operations Training Academy, and specialized in-house classroom and hands-on training (e.g., regional plans and procedures, regional specialized instrumentation, and facility-specific security training). Formalized training lesson plans are currently being developed for the specialized training courses, but have not been implemented. A regional draft RAP Training Plan, dated October 25, 2004, has been proposed for use by each RAP region but has not been approved by NA-40 or implemented. The development of a Region 5-specific RAP Training Plan is not anticipated.

Training on the use of the RAP-wide Asset Readiness Management System (ARMS) training database was given to the ANL RAP contractor staff on December 15-16, 2005. The ARMS database provides a training matrix for each RAP position and identifies the competencies for the core topics required in the FOG. The training coordinator has included additional training requirements, not listed in ARMS, in the Argonne Training Management System for each RAP position. Together, the ARMS database and the Training Management System provide a total record of training for RAP contractor and DOE personnel. Team member qualifications are closely monitored by the training coordinator.

The Region 5 RAP consists of 5 Team Leaders, 5 Team Captains, and 18 health physics survey/support personnel (HP/SPs). Currently, all of the Team Captains are fully qualified; however, one of the Team Leaders and seven of the HP/SPs need to complete the RAP Training for Emergency Response (RAPTER) training in order to be fully qualified. RAPTER training requirements have not been fulfilled because these RAP members are relatively new to the program, and the RRC determined that core training requirements were to be completed before receiving the RAPTER training, which is considered the final certification. However, the personnel who lack the RAPTER training are scheduled to attend at the first opportunity in March 2006.

The Region 5 RAP has a commendable training and outreach program for the encompassing 10 states, 19 commercial nuclear power plants, Minot Air Force Base, United States Coast Guard, and Federal

emergency preparedness organizations. Region 5 personnel conduct training on the transportation emergency preparedness program, radiological emergency preparedness, basic health physics, and response to radiological accidents or incidents for these entities.

Drills are conducted to train RAP personnel on new policies, procedures, and/or equipment. Drill credit is also given to the team members for their deployment activities. In CY 2005, Region 5 RAP team members participated in major exercises with various regional entities, deployed to four actual responses, and supported the Federal Bureau of Investigation (FBI) in 14 special events.

## Emergency Response

A field performance test was conducted to evaluate the adequacy of RAP plans, procedures, equipment, and training in fulfilling program missions. Phase 1 of the performance test was a mobile search mission for a radiological source, with a follow-on Phase 2 response to a simulated explosion of a radiological dispersal device (RDD).

Most performance test objectives were met satisfactorily, and notifications, communications, team activation, mission planning, source characterization, consequence assessment, and emergency public information activities were performed effectively. However, as noted below, improvement in some areas is appropriate. Due to actual operational commitments, the DOE Region 5 RRC also acted as the Team Leader for the performance test. During Phase 1 of the performance test, when first notified of the theft of radioactive materials that might necessitate a RAP response, the RRC/Team Leader contacted the Team Captain to have teams placed on standby for possible deployment immediately. The RRC/Team Leader also initiated phone calls to have an alternate Team Leader and Team Captain assigned in case a second response or relief for the deployed team was needed. Upon request by the Headquarters Emergency Response Officer (ERO), the RAP team was promptly activated, and authorization for deployment was properly confirmed. Information was coordinated with the appropriate Federal and local authorities, and notifications to site DOE and ANL management were made promptly. Communications and notifications among team members and other response components, such as DOE Headquarters, were thorough and timely throughout the performance test, including overcoming

communication difficulties by use of a relay node to maintain communications between field teams and command. Most RAP team members clearly understood their roles and responsibilities as described in plans and procedures, and they demonstrated proficiency in applying available procedures and training to plan deployments to safely accomplish assigned missions.

Mission planning provided the basis for equipping the team and identifying hazards to ensure the safety of team members. Maps and consequence assessment information were used to plan field monitoring activities, mission and safety briefings were provided to the RAP team, and personal protective equipment requirements and turn-back limits were established. For example, the team scientist provided search teams with estimates of unshielded dose rates from the suspected source prior to the search. Careful attention to staging of equipment in vehicles permitted the teams to deploy on their missions in approximately 50 minutes, well within the prescribed FOG goal of two hours. Triage spectra (and identification) were collected and accurately transmitted, permitting positive identification of the suspected source. Although the NA-40 ERO could not be immediately reached (no callback was received for 50 minutes) to coordinate Triage support, a requirement of the Triage procedure, data was sent and received back without difficulty.

The potential for personnel safety issues due to the possible presence of explosives should have been a factor in search planning, but this issue was not recognized by all RAP team managers. Consequently, no clear determination was made that all hazards were known and acceptable for search within the isolation zone.

Consequence assessments and associated protective actions were not always effectively communicated. The team scientist performed a HotSpot dispersion analysis of the potential consequences of detonation of the suspected RDD at the first opportunity after all appropriate parameters were available. Based on the analysis, the applicable radiological protective action guide was exceeded to about one kilometer. At that time, an isolation zone of 100 meters was in place, set by the lead Federal agency for the response (FBI) based on explosives criteria. Although the scientist communicated the results of the HotSpot analysis to the Team Captain, no recommended protective actions based on the projected consequences were formally developed and communicated by team managers to the Incident Commander for consideration. Additionally, during discussions with the Team Leader

and Incident Commander, the PIO recommended a 500 meter perimeter isolation zone for an RDD, and erroneously advised the Incident Commander that protective actions could only be determined by State emergency management officials. Discussions by the Team Leader, PIO, and Team Captain regarding recommended protective actions took place in the presence of the Incident Commander, resulting in the Incident Commander's involvement in the discussions and direct interface with team members other than the Team Leader (in contravention of planned command and control interfaces). The final result was that no coherent message regarding the adequacy of the protective actions was given to the Incident Commander.

Characterization of field deposition to identify the outer boundaries of the plume was well planned on the basis of the HotSpot dispersion model results discussed above. The advantage of using HotSpot instead of National Atmospheric Release Advisory Center (NARAC) is that the initial analysis can be obtained more quickly; however, the NARAC dispersion model is more accurate and normally results in a smaller area of deposition. NARAC dispersion analysis was initiated but not completed because the team scientist was directed to other duties. Consequently, the field teams were deployed to collect data based on the relatively large area of HotSpot-predicted deposition.

Field teams executed their assignments by utilizing appropriate radiological monitoring equipment. When collected, data was immediately transmitted to the command post, recorded on computer-generated maps clearly depicting the results of field monitoring based on geographical and political boundaries, and overlaid on the HotSpot dispersion model deposition plot, making presentation of data meaningful to decision makers. However, one team contaminated their survey vehicle as a result of driving too far between samples, thus increasing the time needed to characterize the plume because the vehicle had to be exchanged.

The RRC promptly activated an experienced PIO, who was appropriately briefed and immediately executed his responsibilities. His participation in all team management activities from the time of activation equipped him to handle all interactions with the (mock) media. Except as noted above regarding command and control, the PIO's media activities were timely, appropriate, and supportive of the RRC's and Incident Commander's needs, effectively allowing the Team Leader to focus on the mission.



## Readiness Assurance

The RAP Region 5 Management Plan provides some of the framework for an effective readiness assurance program prescribed by the FOG. For example, it establishes appropriate program goals and objectives; describes a variety of acceptable methods for conducting self-assessments; requires documentation of identified weaknesses for the purpose of implementing corrective actions; and establishes expectations for developing and reporting lessons learned. However, some key components are missing, including a frequency for conducting internal assessments, a description of criteria used for the assessments, a method for reporting self-assessment results, and a system for managing any corrective actions. These conditions have resulted in mixed effectiveness of program implementation. For example, annual self-assessments are performed using appropriate evaluation criteria and documentation exists for the identified weaknesses. However, some of the weaknesses have remained uncorrected for years, and there is no corrective action management system that assigns responsibility, establishes due dates, and tracks status. The RRC uses several mechanisms to communicate issues and needed corrective actions to NA-40, including periodic teleconferences, video conferences, and written monthly reports, all of which the Region 5 RRC participates in actively.

The FOG and the standardized Readiness Assurance Plan for RAP clearly establish the expectations for developing lessons learned from exercises, drills, and deployments and the use of the NA-42 Event Tracking System (NETS) as a repository for this information, including after-action reports. The Region 5 RRC, who serves as the functional area manager (RRCs are designated to serve as leaders in functional areas common to all RAP regions) for RAP lessons learned and corrective actions, is a promoter of NETS usage because it develops the reports (in a standardized method using RAP team data input) that are required for developing lessons learned to be shared among the RAP regions. However, while Region 5 personnel have collected some lessons-learned information from team members following deployments, their input has not been entered in the database since August 2005 due to operational planning and deployments. For the same reason, the RRC did not attend the 2005 lessons-learned conference and was unable to attend the January 2006 lessons-learned conference.

## Opportunities for Improvement

This inspection identified the following opportunities for improvement. These potential enhancements are not intended to be prescriptive. Rather, they are intended to be reviewed and evaluated by the responsible NNSA and contractor line management and prioritized and modified as appropriate, in accordance with RAP region-specific programmatic objectives.

### Plans and Procedures

- Consider implementing an operator aid procedure and/or program to:
  - Control the preparation, review, approval, and distribution of the operator aids.
  - Verify the technical accuracy of the operator aids.
  - Provide operator aids and/or checklists in support of existing procedures.
- Continue to assess the needed documentation and subsequently prepare additional procedures and/or checklists, such as:
  - Response procedures and/or checklists for specific team members or activities
  - Administrative procedures for important administrative program elements, such as routine equipment inventory/maintenance or self-assessments
  - Mission-specific response procedures.

### Emergency Public Information

- Consider including specific direction to all team members regarding their interface with the media and the public in the management plan, as well as in position checklists.
- Consider including detailed direction in the RRC/ Team Leader checklist for dealing with the media when assigned the role of Senior Energy Official without PIO support.

## Emergency Facilities and Equipment

- Consider implementing a more formal program to periodically verify equipment readiness.
  - Prepare a checklist of items to be operationally checked.
  - Include such attributes as battery operation and currency of calibration on the checklist.
- Consider establishing a “recall” system for those items that are not currently included in an existing calibration system.
  - Identify the equipment that requires calibration but is not currently included in either the site calibration program or the RSL exchange program.
  - Establish a system of recall for the identified instruments, or include those instruments in an existing program.

## Training, Drills, and Exercises

- To improve the specialized training provided to the RAP team by regional personnel, consider the following:
  - Ensure that formalized training lesson plans are developed and approved.
  - Evaluate the need to re-train RAP team members using the new lesson plans.
  - Schedule and implement training utilizing the new lesson plans.

## Emergency Response

- To ensure complete and consistent communications, consider the following actions:
  - Implement protocols for conducting team management consultations and team member briefings.
  - Conduct formalized briefings for all team members to ensure thorough knowledge of mission hazards and accurate understanding of expected team member actions.

- Consider changing the priority for performing NARAC dispersion analysis to enhance the accuracy of team planning activities and formulation of protective actions that are based on model results.
- To improve the teams’ ability to provide protective action recommendations to decision makers, consider the following:
  - Ensure that plans and procedures clarify the roles and responsibilities of RAP team managers in evaluating radiological incidents for actual or potential impact on public health and safety and making recommendations to appropriate authorities to mitigate such consequences.
  - Conduct training, as necessary, to improve RAP team management’s familiarity with interpreting the NARAC plots and data associated with protective actions.
  - Develop a plan and associated method of presentation for providing the recommendations to decision makers.

## Readiness Assurance

- Consider the following in establishing an effective Region 5 self-assessment program:
  - Update the RAP Region 5 Management Plan to include all elements contained in the FOG and the Readiness Assurance Management Plan developed by the functional area manager for readiness assurance.
  - Implement the RAP standardized internal assessment program.
- Consider the following to improve the lessons-learned program:
  - Become active in submitting timely Region 5 lessons learned to NETS.
  - Obtain agreement with team member line managers to allow use of team members in developing lessons learned following each deployment.

## APPENDIX F

### **RAP REGION 0 – REMOTE SENSING LABORATORY – ANDREWS HIGHLIGHTS (January 23 - 27, 2006)**

The Region 0 radiological assistance program (RAP) serves the National Capital Region, which includes the Capital Beltway and the adjacent counties. While the region does not cover a large area, it has a high population density and many locations of significance. RAP Region 0 operates from the Remote Sensing Laboratory-Andrews (RSL-A) located on the Andrews Air Force Base.

The program is implemented by the Nevada Site Office (NSO) and its operating contractor Bechtel Nevada (BN). It includes the Aerial Measuring System (AMS), Nuclear/Radiological Advisory Team, and several “work for others” projects at this location. Regional program operations are managed by the National Nuclear Security Administration (NNSA) Manager, Eastern Measurements Office, who is responsible for all U.S. Department of Energy (DOE)/NNSA assets based at RSL-A. This is the only Federal position at RSL-A, so this individual also serves as the RAP Regional Response Coordinator (RRC) and the Team Leader for most deployments. A second Federal position has been posted but not yet filled. The BN staff is composed of approximately 70 individuals, many of whom are cross-trained and qualified to support various programs. The region provides two, five-person teams on a rotating basis, plus a Team Leader who is typically the RRC. If a RAP team is deployed, another team is placed on call to be ready if needed for a second event or to support the team already in the field. If a second Team Leader is needed, this position is filled by someone from the NNSA Office of Emergency Operations (NA-40) or NSO.

Most RAP activities at Region 0 have been in support of law enforcement anti-terror activities. However, because many of the RAP team members are also qualified to support AMS and the Nuclear/Radiological Advisory Team, individual team members are called on to support a variety of missions.

## **Emergency Planning**

### **Plans and Procedures**

Region 0 has prepared a draft management plan that addresses most of the expectations of the Field Operational Guide (FOG) and describes RAP roles, responsibilities, and processes, including both program management and response to requests for assistance. The draft management plan discusses a team composition that reflects a seven-member RAP team and includes dedicated personnel, such as a scientific specialist, to support extended RAP missions; however, the region currently has only a six-person team implemented in its on-call rotation. The Regional Response Plan, which follows the organization of the plan specified in the FOG (except that it does not describe team activation and deployment), is also in draft form. Region 0 personnel have, however, prepared a brochure that summarizes the RAP program and capabilities and provides current information for contacting Region 0 with a request for assistance. Neither of these plans defines the geographical and political boundaries associated with the National Capital Region and the jurisdictional interfaces between the three regional RAP teams that could have overlapping responsibilities in this area. This lack of definition could result in confusion on the part of requesters and responders and less than optimum outreach activities and interfaces among RAP regional personnel and their supported organizations, such as the Federal Bureau of Investigation (FBI).

Region 0 response activities are supported by a detailed process governing the deployment of RAP personnel. The process is implemented using a checklist governing the overall assignment of personnel to deployment preparations and team positions, and is supported by additional checklists for

each of the assigned positions. It also includes lists of equipment for a variety of anticipated missions. In addition, on-scene activities are supported by a comprehensive checklist for the Team Captain. Region 0 uses BN procedures to govern activities related to some administrative functions, such as training and readiness assurance. However, no procedures or checklists have been prepared to address response activities for other specific RAP team positions, such as the Team Leader or scientist, or to address mission-specific responses, such as monitoring and assessment or maritime response.

Region 0 has prepared reference procedures for operating some, but not all, of the instruments and devices utilized by the teams. Regional personnel have also prepared job performance aids for several instruments, and a number of the equipment cases include the applicable technical manuals (to provide instructions for startup and operation of the instruments). The procedures, job performance aids, and technical manuals are readily usable by team members; however, procedures and/or performance aids have not been prepared for all the instruments or organized in a unified approach to facilitate control and implementation.

As observed during the performance test, the RAP team is staffed by experienced, highly capable team members who clearly understand their individual roles and responsibilities and the operation of the equipment and instrumentation. The lack of an approved management plan did not significantly affect the team's ability to plan for and respond to the simulated event, and overall, RAP personnel prepared and operated the instrumentation effectively to accomplish the mission. However, difficulties that were observed in operating several of the instruments during the performance test (see Emergency Response, below) might have been avoided through improved processes and procedures for startup and checkout of the instruments prior to deployment.

## Emergency Public Information

The RRC/Team Leader has had considerable spokesperson training and experience dealing with the media during real events. However, when deployed on a mission, the RRC/Team Leader has no public information officer assigned at RSL-A to be the primary point of contact or liaison for providing information and/or briefings to the news media and public, as required by the FOG. When needed, public affairs support is requested from NSO or DOE Headquarters. NSO Public Affairs confirmed that to

the extent possible they are prepared to provide support via telephone. But, based on the needs of the mission client and the degree of media interest, the NSO would reach out to other DOE/NNSA field elements in the proximity of the mission for deployment of a public affairs officer to the team. While this process appears to be well thought out, emergency public information support activities for RAP Region 0 are described only in draft RAP management and response plans, and those descriptions are not consistent. Additionally, there is no procedure or checklist detailing what factors to consider when determining the level of public affairs support that may be needed, such as the degree of media interest; when to initially request public affairs support; and how to obtain that support. Although this topic is addressed in training, deployment checklists and briefings do not remind team members to refer all media inquiries to the Team Leader.

## Emergency Preparedness

### Emergency Facilities and Equipment

The facilities and equipment available to Region 0 personnel provide excellent support for current missions. Equipment is appropriately controlled, calibrated, and maintained, although the calibration program does not always provide a means for the users to positively verify that instruments have been calibrated as recently as required. Equipment and supplies are stored in dedicated storage areas that provide positive means for control, assembly, and inventory of equipment before and after deployments. A walkdown of the facilities and equipment revealed that the equipment is properly stored and readily available, and some equipment is pre-staged in a deployment area to facilitate activation and deployment. Personal gear, including personal protective equipment and clothing, is issued to each of the RAP personnel, is subject to periodic inventory and maintenance checks, and is stored in the deployment area. Region 0 does not possess a few pieces of equipment (for example, some alpha survey meters) that are currently designated for its use in the FOG and Policy Note #7.

Region 0 has a variety of support vehicles (ranging from vans to large trucks) that are located in close proximity to the equipment and easily accessible for equipment loading, and most of the equipment is pre-loaded in hard carrying cases or duffel bags. Consequently, the team is able to mobilize quickly for a given deployment.



Equipment inventory is tracked, and monthly instrument checks are performed in accordance with a maintenance notebook. An overview matrix provides a tracking mechanism for the completion of checks on each system. Individual system matrices provide additional details, such as a record of the individual piece of equipment by serial or property number, date of the check, initials for completion, date of the data system entry, and delineation of detailed checks (e.g., alarms, battery, spare battery). A review of several months of equipment checks indicated that (with one exception) the checks have been completed and documented as scheduled; the exception is that the records do not document the completion of the Infield monthly calibration checks. Additionally, one set of instruments, the low-energy gamma survey instruments, are not included in the monthly maintenance checks. Region 0 practice is to rely on the monthly maintenance process to ensure equipment operability, and to deploy without performing source or operability checks on equipment that does not require assembly.

Calibration recall of the radiological instrumentation has been tracked and documented through the Emergency Response Data System, which is being replaced by the Asset Readiness Management System (ARMS). Some instruments are calibrated at the Remote Sensing Laboratory-Nellis or at the equipment vendor, and these instruments are clearly marked with calibration stickers. Other instruments are calibrated at the Region 0 facility; these instruments are not marked with calibration stickers. Instruments that are out of service are placed in segregated storage or clearly tagged.

During the performance test, personnel deployed with three instruments that were not in operating condition. Two instruments were broken (one was repaired en route), and the third was taken without all the components necessary for assembly in the field.

## Training, Drills, and Exercises

The training, drill, and exercise program for the Region 0 RAP adequately prepares team members for their specific RAP functions and responsibilities. Team members receive specialized in-house classroom and hands-on training (e.g., regional plans and procedures, regional specialized instrumentation, facility-specific security training) and attend Emergency Operations Training Academy courses to fulfill training requirements. Training requirements are identified in a matrix for each RAP team position. Formalized lesson plans have been developed for in-house training

except for training on the equipment; however, proficiency training is given to RAP personnel on the equipment to ensure retention of knowledge on equipment operations. A draft RAP Training Plan, dated October 25, 2004, has been proposed for use by each RAP region but has not been approved by NA-40 or implemented. The development of a Region 0-specific RAP Training Plan is not anticipated.

Training on the ARMS training database was given to the training coordinator on November 30 and December 1, 2005. The ARMS database provides a training matrix for each RAP position and identifies the competencies for the core topics required by the FOG. The training coordinator has included additional training requirements, not listed in ARMS, in the BN training tracking system (Plateau) for each contractor RAP team position (BN employees). The BN tracking system, in conjunction with ARMS, provides a total record of training for contractor personnel. BN RAP team member qualifications are closely monitored by the training coordinator. However, training records for the Team Leader (a Federal position) at RSL-A and at least one DOE/NNSA Headquarters alternate are not entered into ARMS.

The Region 0 RAP consists of a Team Leader, 6 Team Captains, and 13 health physics survey/support personnel (HP/SPs). Currently, one Team Captain and three of the HP/SPs need to complete RAP Training for Emergency Response (RAPTER) training in order to be fully qualified. RAPTER training requirements have not been fulfilled because these RAP members are relatively new to the program. However, the Team Captain was scheduled for the January RAPTER training, and the HP/SPs are scheduled to attend in May 2006.

The Region 0 RAP training and outreach coordinator conducts training for the Coast Guard, the FBI Washington Field Office, and fire departments encompassing the National Capital Region on the transportation emergency preparedness program, radiological emergency preparedness, and response to radiological accidents or incidents. Although Region 0 includes counties that would involve coordination with the FBI Baltimore Field Office, outreach activities to that FBI office have consisted of only one training course on radiological emergency preparedness.

Drills are conducted to train RAP personnel on new policies, procedures, and/or equipment, and drill participation credit is also given for deployment activities. Additional means to develop or maintain desired skill levels are provided through exercise participation and frequent deployments. During 2005,



Region 0 RAP team members participated in two radiological dispersal device (RDD) exercises and were deployed to support the FBI for eight special events.

## Emergency Response

A performance test was conducted to evaluate the adequacy of RAP plans, procedures, equipment, and training in fulfilling program missions. Phase 1 of the performance test was a mobile search mission for a radiological source, with a follow-on Phase 2 response to a simulated explosion of an RDD. All activities were performed in the field.

Most performance test objectives were met satisfactorily. Staffing limitations required the DOE Region 0 RRC to also act as the Team Leader for the performance test. During Phase 1 of the performance test, when first notified of the theft of radioactive materials that might necessitate a RAP response, the RRC/Team Leader contacted the contractor response coordinator (CRC) and the Team Captain to immediately place the on-call team on standby for possible deployment. Shortly thereafter, the CRC recalled all remaining Region 0 personnel to assist as support personnel in equipment loading, and reconstituted a second team in case another response or relief for the deployed team was needed. Upon request by the Headquarters Emergency Response Officer, the RAP team was promptly activated, and authorization for deployment was properly confirmed. Notifications to NSO and BN management were made promptly, and the RRC/Team Leader coordinated the response with the FBI liaison at the Washington Field Office and local authorities. Communications and notifications among team members and other response components, such as DOE Headquarters, were timely throughout the performance test; for example, the RRC/Team Leader made frequent notifications to DOE Headquarters and NSO concerning deployment status and mission progress. Deployment checklists, logs, and status boards were used effectively to record activities and maintain a legal record of deployment status. RAP team members clearly understood their roles and responsibilities, and they demonstrated proficiency in applying checklists and training to plan deployments to safely accomplish assigned missions.

The initial briefings thoroughly covered mission objectives, security, and safety. Planning discussions included such topics as equipment capabilities and limitations, the potential for contamination due to the form of the source material, turn-back limits for the

team, National Atmospheric Release Advisory Center (NARAC) “what if” simulations, approach to and location of the command post with respect to expected radiation dose rates, and safe approach methods. Contributing to effective mission planning were a good understanding of available tools, such as AMS plots, and the recognition of the communication security issues associated with the mission. Team deployment occurred within the prescribed FOG goal of two hours. The safety of team members was factored into all planning and direction by the RRC/Team Leader, as were the health and safety of the public and other response organizations. For example, the approach to the event scene accounted for the potential for detonation of the RDD and the expectation of high radiation fields a good distance from the source. The protection of the team and other responders at the command post from contamination and radiation dose was established as a priority, including establishment of appropriate personal protective equipment following detonation of the RDD. For example, upon arrival of the team at the incident command post, the habitability of the area was promptly assured, appropriate personal monitoring equipment was provided to the Incident Commander, and a good status briefing and determination of expectations were performed.

Some lapses in communications and equipment readiness delayed the response. For example, although mission planning included the use of a specialized mobile search vehicle, the load master did not receive direction to ready the equipment for deployment. Team management noted that the vehicle was not included in the convoy when departing the equipment storage area and ordered that it be added to the deployment. At least three pieces of portable equipment that were deployed to the field were inoperable: the primary isotope identification instrument and one of its backup instruments, and one of the field survey instruments. In each case, field data collection was performed with backup equipment for the scenario conditions; under different circumstances, such as response to an improvised nuclear device, data collection would not be optimal with the backup equipment. Although required by procedure and/or general operating protocols, applicable source checks of emergency response equipment were not observed.

A lapse in command and control between team management and personnel in the mobile search vehicle resulted in the vehicle moving past the command post to the immediate location of the suspected RDD and stopping at that location for approximately five

minutes. Prompting by the performance test controller caused the operator to withdraw the vehicle from the scene. Some protocols for mobile searches were not followed.

Triage spectra (and identification) were collected and accurately transmitted with ease using satellite communications, permitting positive identification of the suspected source; however, the team neglected to get a photo of the data collection configuration to pass to the Triage team, and the Triage data message did not include some information specified in the Triage procedure. This lapse had no adverse consequences for this scenario, since the source configuration was relatively simple.

Consequence assessments and associated protective actions were promptly determined using the best available information and communicated to the on-scene commander. The team scientist, without delay, initiated NARAC dispersion analysis of the potential consequences of detonation of the suspected RDD after appropriate parameters were available for the analysis. Based on the “what if” analysis, radiological protective action guides would be exceeded to about 200 meters in event of a detonation, but that result was not communicated to the Incident Commander. At that time, a protective action zone of 100 meters was in place, set by the lead Federal agency for the response (FBI) based only on explosives criteria. After the simulated explosion, team management immediately performed another NARAC dispersion analysis based on the latest parameters and communicated appropriate, revised recommendations to the Incident Commander. Team management demonstrated good understanding of NARAC plots and protective action guides, and they effectively communicated their recommendations to the Incident Commander through illustrations on NARAC plots.

Characterization of field deposition to identify the outer boundaries of the plume was well planned based on the updated NARAC dispersion model results discussed above. Two field teams were deployed, one on each side of the relatively accurate NARAC-computed deposition area, resulting in timely data collection. Field teams executed their assignments by utilizing appropriate radiological monitoring equipment. The performance test was terminated due to operational requirements before field data results were collected and transmitted back to the command post for management evaluation, so the evaluation of protective actions based on field measurements was not observed.

Early in the event, the RRC/Team Leader called NNSA/NSO public affairs regarding RAP support of the mission. During that call, the RRC/Team Leader set parameters regarding the level of information he would release to the media/public if required. Upon arrival at the incident command post, the RRC/Team Leader acknowledged to the Incident Commander that the FBI was in charge of emergency public information and offered support to develop news releases if needed. Performance test play was terminated before additional challenges were provided to the RRC/Team Leader.

## Readiness Assurance

Programmatic self-assessments are performed by BN that include, but are not limited to, the RAP. These assessments are scheduled a year in advance and have included training, cyber security for deployable computers, and deployment procedures. Assessments are conducted by BN personnel based in Nevada as well as at Andrews. The issues identified by the self-assessments indicate that critical reviews are performed and that weaknesses are properly identified. Although a RAP Region 0 management plan that defines some readiness assurance requirements has been drafted, it has not been approved, and some elements contained in the draft plan are not implemented. For example, the draft plan appropriately lays out a schedule for assessing program elements so that the entire program is assessed on a three-year basis; however, this schedule has not been implemented.

Lessons-learned meetings are held following each planned deployment. Minor issues are assigned and corrected locally without the use of an issues tracking system. Other issues that require coordination, funding, or management direction are entered into a formal tracking system operated by BN at the Nevada Test Site. Lessons learned and corrective actions from self-assessments are managed effectively using BN databases implemented at the Nevada Test Site and in accordance with BN procedures. Five-day reports are used by the RRC to communicate issues that require coordination with DOE/NNSA Headquarters or other RAP regions. Because no one at Region 0 is trained or assigned to input information into the NNSA Office of Emergency Response (NA-42) event tracking system (NETS), five-day reports and lessons learned are typically emailed to NA-42 and input by their support contractor. Lessons learned and corrective actions from self-assessments are implemented effectively and have resulted in program improvements.

## Opportunities for Improvement

This inspection identified the following opportunities for improvement. These potential enhancements are not intended to be prescriptive. Rather, they are intended to be reviewed and evaluated by the responsible NNSA and contractor line management and prioritized and modified as appropriate, in accordance with RAP region-specific programmatic objectives.

### Plans and Procedures

- Consider implementing an operator aids procedure and/or program to:
  - Provide operator aids and/or checklists in support of existing procedures.
  - Control the preparation, review, approval, and distribution of operator aids.
  - Verify the technical accuracy of operator aids.
- Continue to assess the needed documentation and subsequently prepare additional procedures and/or checklists, such as:
  - Response procedures and/or checklists for specific team members or activities
  - Startup procedures or checklists for equipment assembly and checkout prior to deployment
  - Mission-specific response procedures.

### Emergency Public Information

- Consider including specific details for contacting both the NSO and DOE Headquarters public affairs offices in the management and response plans, as well as in the RRC/Team Leader checklist.
- Consider including specific direction to all team members regarding their interface with the media in the management and response plans, as well as in position checklists.

## Emergency Facilities and Equipment

- To ensure that the equipment maintenance program and process for verifying readiness prior to deployment results in operable equipment in the field, consider the following:
  - Establish a system to ensure that all equipment is appropriately marked with readily identifiable calibration information (for example, last performed and next due dates).
  - Ensure that all deployable equipment is appropriately included in the monthly equipment preventive maintenance program.
  - Review equipment maintenance and preparation activities, identify items that need to be operationally checked prior to deployment, and prepare the appropriate pre-deployment checklists.

### Training, Drills, and Exercises

- Consider the following improvements to the training, drill, and exercise program:
  - Ensure that training data for all Federal personnel who could deploy as RAP Team Leader is entered into ARMS.
  - Improve the equipment training provided by regional personnel through development and implementation of formal lesson plans.
  - Ensure that RAP team members complete qualification and training requirements.

### Emergency Response

- Consider a more formalized approach to on-scene briefings for all team members to ensure thorough knowledge of the mission hazards and accurate understanding of expected team member actions.

### Readiness Assurance

- Consider the following in establishing an effective Region 0 self-assessment program:

- Ensure that all elements of the RAP Region 0 program identified in the FOG and Region 0 Management Plan are assessed on a triennial basis.
  - Use the RAP standardized internal assessment program to identify any elements not adequately covered by the BN self-assessment program.
- Consider assigning and training one or more staff members on the use of NETS to facilitate the sharing of lessons-learned information.

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### **Abbreviations Used in This Report (continued)**

NSO	Nevada Site Office
PIO	Public Information Officer
RAP	Radiological Assistance Program
RAPTER	Radiological Assistance Program Training for Emergency Response
RCO	Regional Coordinating Office
RDD	Radiological Dispersal Device
RRC	Regional Response Coordinator
RSL	Remote Sensing Laboratory
RSL-A	Remote Sensing Laboratory-Andrews