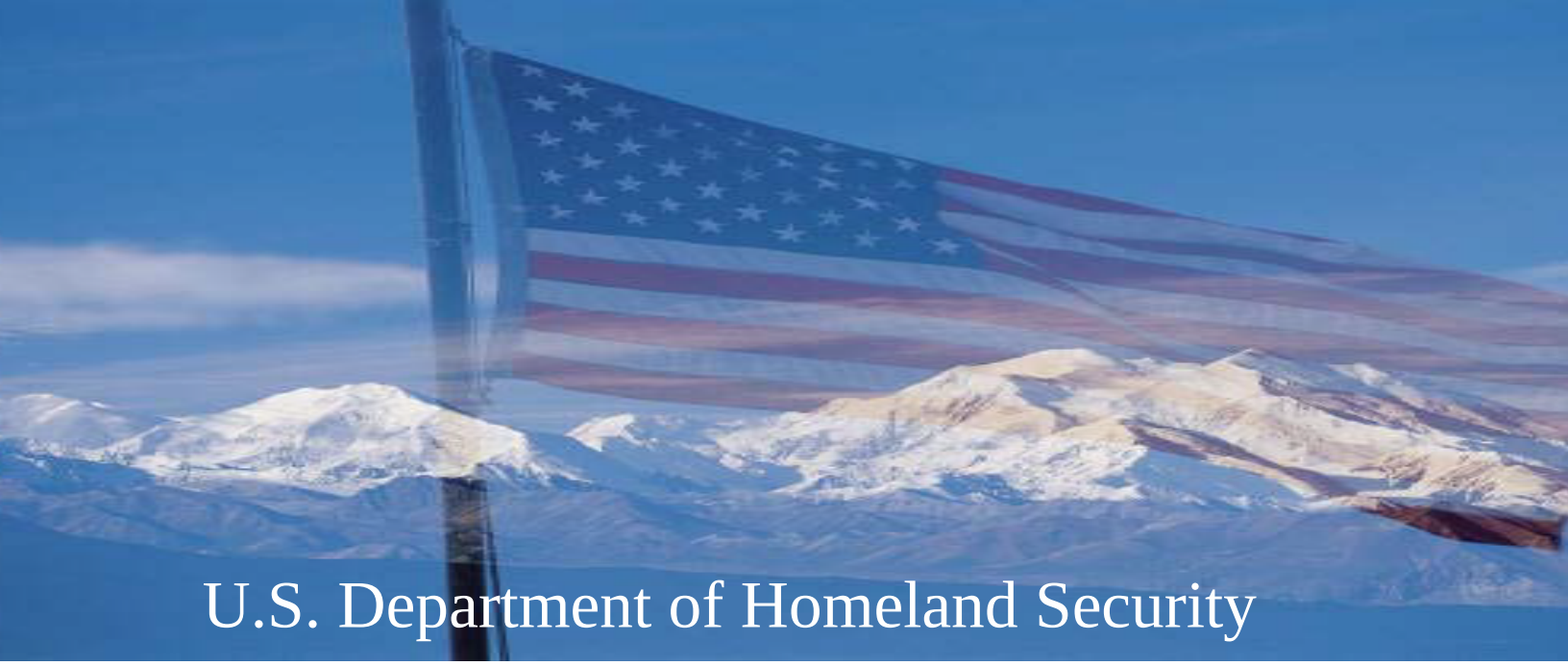

FISCAL YEAR 2013

HOMELAND SECURITY GRANT PROGRAM

SUPPLEMENTAL RESOURCE:
Radiological / Nuclear Detection Guidance

U.S. DEPARTMENT OF HOMELAND SECURITY

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A. DNDO Background and Mission

The Domestic Nuclear Detection Office (DNDO) was established in the Department of Homeland Security (DHS) by Presidential Directive on April 15, 2005. DNDO plays an essential role in coordinating and implementing a defensive strategy, with domestic and international programs, to protect the Nation from a nuclear or radiological terrorist attack. Because no single layer within the strategy is capable of providing complete effectiveness in detecting and interdicting radiological and nuclear (rad/nuc) materials intended for illicit use, DNDO promotes a multi-layered strategy.

DNDO is the primary agency within the U.S. Government responsible for coordinating the Global Nuclear Detection Architecture (GNDA), which is a worldwide network of sensors, telecommunications, and personnel, with the supporting information exchanges, programs, and protocols that serve to detect, analyze, and report on nuclear and radiological materials that are out of regulatory control. DNDO supports the development of the domestic portion of the GNDA. Grantees are encouraged to work closely with DNDO when developing, enhancing, or sustaining rad/nuc detection programs to ensure that their programs are efficiently integrated into current and future national efforts and that they are able to leverage existing capabilities, best practices, and lessons learned from previous efforts.

DNDO is coordinating development, test, and evaluation programs to assess and improve the Nation's capabilities for detection, identification, and reporting of rad/nuc materials. By integrating these programs with operational support responsibilities, DNDO will ensure technologies are appropriately deployed, with training materials and well developed operational response protocols. Working with federal, state, local, territorial, and tribal partners, DNDO has piloted initial training programs and developed detection alarm protocols that can be customized for specific operational missions.

B. Federal, State, Local, Territorial, and Tribal Partnerships

DHS values the importance that effective sharing and use of information, intelligence, and systems play in strengthening our Nation's security. DNDO seeks to integrate crucial overseas detection programs with the nuclear detection efforts undertaken by federal, state, local, territorial, and tribal governments and the private sector domestically. To facilitate an effective partnership with state and local entities that are involved in rad/nuc detection activities, DNDO will continue to pursue a coordinated delivery of DNDO products, programs, and services to expand state, local and tribal capabilities.

C. Building Adaptable Radiological/Nuclear Detection Capabilities

State, local, and tribal entities are encouraged to implement comprehensive rad/nuc detection programs in support of, and in concert with, the domestic portion of the

GNDA, as appropriate. DNDO recognizes that implementing a comprehensive program takes time and requires substantial regional coordination and resources.
DNDO promotes a layered defense incorporating a variety of technical (e.g., rad/nuc detection equipment) and non-technical (e.g., awareness training and information sharing) detection capabilities to improve the probabilities of encountering and detecting nuclear and radiological materials out of regulatory control.

DNDO also promotes building adaptable rad/nuc detection capabilities, which can respond to intelligence-driven events. Depending on the needs of the state, local, or tribal entity, rad/nuc detection capabilities may be deployed on a daily basis or only as needed (e.g., specialty teams) and in various operating environments and pathways (e.g., commercial vehicle inspection, special events screening, small maritime vessel monitoring, and critical infrastructure protection).

D. Maintaining and Sustaining Radiological/Nuclear Detection Capabilities

Maintenance and sustainment are critical aspects of an enduring, comprehensive rad/nuc detection capability and should be considered throughout the life cycle of any capability development program. DHS preparedness funding may be used for maintenance contracts, warranties, repair or replacement costs, upgrades, and user fees under all active and future grant awards, unless otherwise noted. However, grantees are reminded to be sensitive to supplanting issues. For more about allowable maintenance and sustainment costs, please see Information Bulletins #336 and #348 at http://www.fema.gov/grants/grant-programs-directorate-information-bulletins. Grantees are encouraged to contact DNDO at DNDO.SLA@dhs.gov prior to initiating program activities in order to take advantage of available program guidance, tools, resources, and updates.

E. Alignment with *Presidential Policy Directive (PPD) 8: National Preparedness* and the Threat and Hazard Identification and Risk Assessment (THIRA) Process

Grantees should ensure that strategic planning for a rad/nuc detection program aligns with PPD-8 guidance and state and local strategic priorities. Specifically, rad/nuc detection program managers should ensure that the rad/nuc detection mission is incorporated into broader state and local strategic preparedness planning efforts, including the THIRA process, through the respective state or urban area working groups to ensure proper coordination of regional resources.

FEMA's Comprehensive Preparedness Guide (CPG) 201: THIRA Guide provides an overview of the THIRA process and can be found online at: http://www.fema.gov/plan. Figure 1 outlines the five-step THIRA process.

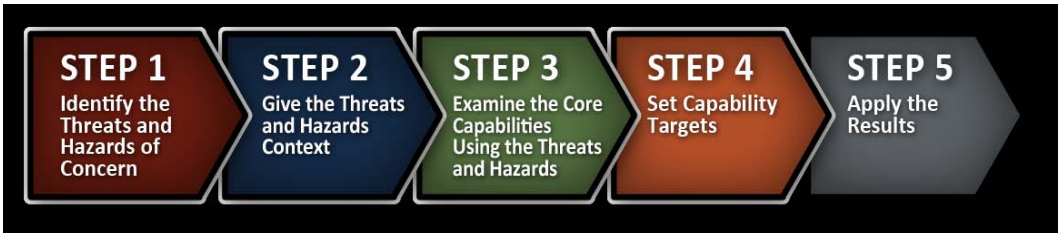

Figure 1. The Five-Step THIRA Process

Rad/nuc detection program managers should ensure that if state and local leaders consider improvised nuclear devices (IND) or radiological dispersal devices (RDD) a threat to their jurisdiction, these hazards are identified in Steps 1 and 2 of the THIRA process. In Steps 3 and 4 of the THIRA process, program managers should refer to the PPD-8 core capabilities and associated desired outcomes to determine rad/nuc detection capability targets. The core capabilities applicable to a rad/nuc detection program include, but are not limited to:

- Screening, Search, and Detection
- Planning
- Risk Management
- Operational Coordination
- Intelligence and Information Sharing
- Public Information and Warning

Additional information on the core capabilities and associated desired outcomes can be found in the National Preparedness Goal at http://www.fema.gov/preparedness-1/national-preparedness-goal. Program managers should also use the Radiological/Nuclear Detection and Adjudication Capability Development Framework (see Section F.1 and Appendix D) to further refine rad/nuc detection-specific target outcomes.

F. Available Resources and Allowable Costs

DNDO is working in close coordination with federal, state, local, territorial, and tribal entities to develop program assistance (PA) programs to build and enhance rad/nuc detection programs through the planning, organization, equipment, training, exercise, and operational support (POETE/Ops) framework as outlined in Table 1. This POETE/Ops framework aligns with the National Preparedness Goal, State Homeland Security Strategies, and all reporting requirements for DHS preparedness grant programs.

Table 1. Assistance for Rad/Nuc Detection Programs

Planning	DNDO can provide planning assistance and support the development of protocols and programs.
Organization	DNDO can provide program management guidance to support a successful, comprehensive rad/nuc detection program.
Equipment	DNDO evaluates rad/nuc detection equipment and can provide guidance on integrated sets of equipment to meet detection and alarm resolution mission priorities.
Training	DNDO has developed standardized training courses and curricula to assist state, local, and tribal entities in the development and implementation of initial and refresher training programs.
Exercises	DNDO has developed exercise guidelines and can support rad/nuc detection exercise development and execution.
Operational Support	DNDO can provide technical reachback support and access to information sharing systems 24/7 via the DNDO Joint Analysis Center.

The following DNDO services are available to state, local, territorial, and tribal grantees that wish to develop, enhance, or sustain rad/nuc detection programs.

Additional information about these programs and products is available on the rad/nuc detection Community of Interest (COI) described below or by contacting DNDO at DNDO.SLA@dhs.gov.

F.1. Planning and Organization

Plans and Protocols. Working in coordination with federal, state and local rad/nuc detection operators, DNDO has created planning templates and compiled examples to assist in the establishment of concepts of operation (CONOPs) and standard operating procedures (SOPs) for rad/nuc detection operations and alarm resolution.

Program Management (PM) Handbook. DNDO has developed a rad/nuc detection Program Management Handbook, which includes modules and technical appendices addressing specific operational environments such as commercial vehicle inspection (CVI), small maritime vessel operations, and special events. This handbook provides guidance for administration of a domestic rad/nuc detection program and is intended to assist program development and implementation at both the senior policy making and operational levels.

- The CVI module and technical appendix focuses on the rad/nuc security risks posed by commercial vehicles.
- The Small Maritime Vessel module and technical appendix focuses on the rad/nuc security risks posed by small maritime vessels (those vessels that are less than 300 gross tons).
- The Special Events module and technical appendix focuses on the rad/nuc security risks posed by special events.

National Incident Management System (NIMS) Resource Type Definitions. The NIMS Resource Type Definitions for rad/nuc detection equipment, teams, and personnel were developed in 2011 with direct state and local participation to assist state, local, and tribal stakeholders with defining and identifying rad/nuc detection capability and allow jurisdictions the ability to categorize and deployed through the Emergency Management Assistance Compact (EMAC) or other interstate mutual aid agreements and compacts. See Appendix C for the NIMS Resource Type Definitions.

Radiological/Nuclear Detection and Adjudication Capability Development Framework (CDF). The CDF planning guidance assists state, local, and tribal jurisdictions with identifying and developing recommended levels of rad/nuc detection capability based on risk factors and the likelihood of encountering illicit rad/nuc material. The CDF is based on lessons learned provided by federal, state, territorial, and local subject matter experts. It is intended to provide strategic guidance based on best practices, but not to establish specific requirements. The CDF is DNDO guidance modeled on the FEMA Target Capability List (TCL) version 3.0., and can be leveraged to support grant investment justifications. See Appendix D for the CDF. A CDF Calculator is also available to assist jurisdictions with identifying recommended levels of rad/nuc detection capability quickly and easily. The CDF and supporting resources are available on the PRND Community of Interest (COI) web portal (see below).

Rad/Nuc Detection Community of Interest (COI) Web Portal. This Homeland Security Information Network (HSIN) COI provides consistent, useful rad/nuc detection information to the federal, state, local and tribal rad/nuc detection community. The intent of the site is to enhance communication between DNDO and the broader rad/nuc detection community while providing a forum where vetted users can securely collaborate to share examples, best practices and lessons learned. The COI provides access to many DNDO capability development documents and is intended to be the one stop shop for federal, state, local, territorial, and tribal operators seeking to build or enhance rad/nuc detection capability.

Interested officials with a “need to know” may request access by emailing PRND_COI@hq.dhs.gov with the subject line “PRND COI HSIN Access Request.”

F.2. Equipment

Grantees intending to purchase rad/nuc detection equipment are strongly encouraged to consider only instruments that have been independently tested by accredited laboratories and have demonstrated conformity with the applicable ANSI/IEEE N42 standards. Manufacturers offering new equipment for consideration should be asked to provide evidence of independent testing for compliance with these standards. DNDO has resources described below that are available to assist federal, state, local and tribal entities in selecting the right rad/nuc detection equipment to meet their operational needs.

Equipment Test Results. DNDO has conducted several equipment test campaigns to evaluate the effectiveness of detection systems in multiple performance areas to better inform the rad/nuc detection procurement decisions of federal, state, local, territorial, and tribal entities. Several of these test campaign results are available on the COI and the Responder Knowledge Base (RKB) at *http://www.rkb.us*, while others may be requested by contacting DNDO directly. Examples of test reports include:

- Anole Test Campaign Report for handheld, backpack, and mobile systems (available on COI and RKB)
- Bobcat Test Campaign Report for commercial-off-the-shelf and prototype PRDs (available on COI and RKB)
- Crawdad and Dolphin Test Campaign Reports for boat-mounted detection systems (available upon request)
- Gryphon Test Campaign Report for aerial detection systems (anticipate availability during 2nd quarter 2013)

DNDO continues to conduct additional equipment test campaigns and stakeholders are encouraged to contact DNDO to learn more about these and upcoming tests.

Graduated Rad/Nuc Detector Evaluation and Reporting (GRaDER®) Program. The GRaDER program provides a continuing means of independently testing and assessing commercially available rad/nuc detection equipment against ANSI N42 performance standards on a voluntary basis by equipment vendors. When test results are available, GRaDER will provide performance and operationally relevant technical information on tested systems to DHS components and other federal departments, as well as state, local, territorial and tribal government law enforcement and first responders via the RKB. Test results from GRaDER evaluation of 14 rad/nuc detection instruments will be available on the RKB in mid-2013. More information on the GRaDER Program is available at *http://www.dhs.gov/GRaDER*.

Special Requirements for Neutron Detection Equipment. Helium-3 (^{3}He) is an important element used in several national security, homeland defense, and medical applications. The supply of ^{3}He is extremely limited and while research is currently being conducted to develop alternative materials for neutron detection, grantees developing rad/nuc detection capability may be unable to acquire ^{3}He gas for neutron detection equipment. Therefore, grantees seeking to develop or enhance neutron detection capabilities are encouraged to contact DNDO for more information about the availability of ^{3}He and alternative detection technologies.

Mobile Detection Deployment Program. DNDO's Mobile Detection Deployment Program (MDDP) maintains trailer-based units outfitted with an extensive suite of radiation detection equipment and command and control capabilities. These Mobile Detection Deployment Units (MDDUs) offer a national rad/nuc detection surge package that can be deployed as needed to assist stakeholders with augmenting their resident capabilities. Each MDDU contains a number of mobile units, backpacks, high-resolution handheld devices, personal radiation detection devices, communications, and tracking equipment and is configured to outfit up to 40 personnel. Each MDDU is accompanied

by technical support staff to train personnel on the use of equipment and to help integrate these surge capabilities into existing operations. Requests for a MDDU should be directed through DNDO at DNDO_MDDU_Request@hq.dhs.gov.

Equipment Types. There is a broad range of sizes and capabilities for rad/nuc detection equipment. Some of the radiation detection and identification equipment that can be utilized include, but are not limited to:

- **Personal Radiation Detectors (PRDs)** are effective as personnel protection devices and can provide limited utility for detecting nuclear threats in some scenarios. They are sometimes used as a "tripwire" to detect the presence of radiation and trigger the use of more capable detectors. Newer versions of these devices provide low-resolution spectroscopic capabilities suitable for the identification of some nuclear and radioactive materials. *Reference: ANSI / IEEE N42.32-2006 , ANSI / IEEE N42.48-2008*

- **Hand-held Radioisotope Identification Devices (RIIDs)** are designed to identify the isotopic composition of radioactive sources, typically based on low-resolution gamma spectroscopy. A fewer number of high-resolution RIIDs are being deployed because of cost and field operations considerations. *Reference: ANSI / IEEE N42.34-2006*

- **Human Portable (Backpack) Radiation Detectors** are often capable of detecting both gamma and neutron emissions. These may include the ability to identify specific isotopes. Such systems may be used in either covert or overt operational mode generally to help search for threat materials. *Reference: ANSI / IEEE N42.43-2006*

- **Mobile and Transportable Detectors** generally use large volumes of gamma-sensitive detectors (e.g. PVT or sodium iodide) and arrays of helium-3 proportional counters for neutron detection, either mounted in a vehicle (e.g., truck, boat, or aerial platform), a trailer, or other transportable form-factor. They can be used for area surveillance, search, or other temporary deployments. *Reference: ANSI / IEEE N42.43-2006*

- **Radiation Portal Monitors (RPMs)** are large, usually stationary detectors typically composed of polyvinyl toluene (PVT) for gamma detection and helium-3 for neutron detection. By virtue of their size, these devices are much more sensitive than handheld detectors. The RPM can be susceptible to nuisance alarms and, like all passive radiation detection technologies, may have difficulty in detecting shielded nuclear and radiological material. Newer versions of portal monitors also provide limited nuclide identification capabilities. *Reference: ANSI / IEEE N42.35-2006*

F.3. Training

In order to address the needs of those organizations interested in obtaining RAD/NUC training for their personnel DNDO has developed multiple training delivery systems through strategic partnerships with such agencies as EOTA, FEMA/NTED, as well as, private sector online training developers CSI and SLI. Resources and materials can be found through the DNDO Training SharePoint site located at https://gnda.energy.gov/login/registration/home.aspx and the NTED Federal Sponsored Course Catalog located at https://www.firstrespondertraining.gov/webforms/pdfs/fed_catalog.pdf.

Course offerings are listed in the catalogs noted above. Included are courses at the awareness level, equipment operations, basic and advanced operation levels, and at the program level. Specialty courses, such as Maritime and Aviation oriented courses are also listed.

These courses are unique to the Prevent Mission and specific to Radiological/Nuclear Detection and offered through traditional instructor lead training, as well as, technologically advanced computer based interactive training mediums.

Agencies interested in training should review their training and exercise plan for integration, review equipment requirements, and training requisites related to operations. Agencies should speak directly to their training division for coordination and guidance in writing initial justifications for obtaining funding. Further information on grant guidance and allowable expenditures can be found in Appendix B or at http://www.fema.gov/grants/grant-programs-directorate-information-bulletins.

F.4. Exercises

DNDO provides assistance in developing, designing, and conducting exercises that are compliant with the Homeland Security Exercise and Evaluation Program (HSEEP) methodology. The exercises provide valuable hands-on experience for personnel performing radiation detection missions and assist decision makers in integrating the rad/nuc detection mission into their daily operations.

F.5. Operational Support

DNDO provides information sharing support to federal, state, tribal, territorial, and local entities 24/7 through the Joint Analysis Center (JAC), which provides awareness of the Global Nuclear Detection Architecture (GNDA) to inform decision making and enable coordination of relevant authorities.

The Joint Analysis Center Collaborative Information System (JACCIS) provides GNDA partners a secure web enabled application that includes capability for adjudication connectivity, a detector database, and status information regarding the events and

activities of the GNDA. To request a JACCIS account or information regarding the GNDA, please call 1-866-789-8304 or email dndo.jac2@hq.dhs.gov.

The Source is the JAC's weekly informational bulletin that consists of:

- A summary of Nuclear Regulatory Commission lost and stolen source information of significance posted on their Event Notification page for the previous calendar week
- A summary of news related to the GNDA
- A Detection/Radiation/Nuclear factoid or approved for release (i.e. DNDO Rodeo) announcement.

In the Know is DNDO's monthly pamphlet for stakeholders to showcase ongoing GNDA outreach efforts, with articles and interesting facts written by DNDO and our valued stakeholders. It is not a technical publication, but geared toward helping communicate program development efforts across the GNDA community.

F.6. Allowable Costs

Appendix B outlines the DHS preparedness grants that can be leveraged to build, enhance, or sustain rad/nuc detection programs. In addition, Appendix B identifies which specific rad/nuc detection equipment, via the Authorized Equipment List, is allowed by each grant. Grantees are encouraged to contact DNDO prior to initiating program activities in order to take advantage of available program guidance, tools, resources, and updates.

APPENDIX A: Program Baseline Capabilities Checklist

This Program Baseline Capabilities Checklist outlines baseline capabilities for state, local, and tribal rad/nuc detection programs and the recommended activities to develop and sustain a successful program. This checklist is outlined in the Program Management Handbook, which provides guidance to ensure that rad/nuc detection programs are developed consistently nationwide. The Program Management Handbook can be accessed on the Community of Interest or by contacting DNDO. By achieving this baseline level of capability, a state, local, or tribal rad/nuc detection program will have the necessary structures, processes, and tools in place to detect, analyze, and report on nuclear and radiological materials that are out of regulatory control.

Planning

- ☐ Develop the RND Program concept
- ☐ Identify appropriate stakeholders who may provide input into the design of the RND Program
- ☐ Understand jurisdictional risks posed by rad/nuc threats
- ☐ Determine the RND Program capabilities necessary to address identified risks
- ☐ Develop a RND Program strategy
- ☐ Identify existing complementary programs available for use in the RND Program
- ☐ Determine necessary policies and procedures for accomplishing RND Program goals
- ☐ Define roles and responsibilities needed for administering the RND Program
- ☐ Create a budget to support the RND Program
- ☐ Identify available and accessible funding sources to support the RND Program
- ☐ Address potential risks to establishing the RND Program
- ☐ Identify critical success factors for the implementation and sustainment of the RND Program
- ☐ Evaluate and assess the effectiveness of the RND Program
- ☐ Ensure the continuous improvement of the RND Program

Organization

- ☐ Develop and establish the organizational structure of the RND Program
- ☐ Establish a Program advisory group to provide multi-disciplinary guidance for RND Program administration
- ☐ Outline legal authority necessary to administer the RND Program
- ☐ Understand resources and requirements for multi-jurisdictional coordination for the RND Program
- ☐ Develop and implement the RND Program communications plan
- ☐ Develop and implement the RND Program outreach plan

Equipment

- Define RND Program equipment goals
- Identify factors that may influence equipment goals
- Identify existing equipment available for RND Program use
- Define strategy for obtaining equipment
- Understand and comply with state procurement processes for RND equipment acquisitions
- Manage RND Program equipment inventory
- Ensure the proper use of equipment
- Ensure proper maintenance and calibration of equipment
- Ensure equipment use, maintenance, and calibration protocols align with training and exercises
- Test and evaluate the operational effectiveness of RND Program equipment
- Create and manage the RND Program equipment budget
- Understand grant and funding considerations specific to RND Program equipment

Training

- Define RND Program training goals
- Identify training programs and resources available for use in the RND Program
- Develop a strategy for executing RND Program training
- Administer, manage, and sustain RND Program training
- Ensure training subject matter and curriculum aligns with equipment and exercises
- Ensure training program aligns with GNDA Goals 1, 2, 3, and 4
- Test and evaluate the effectiveness of RND Program training
- Create and manage a training budget
- Understand additional grant and funding considerations specific to RND Program training

Exercises

- Define RND Program exercise goals
- Identify existing factors that may influence the execution of RND Program exercises
- Identify current resources and exercises that can be used for the RND Program
- Develop a strategy for executing RND Program exercises
- Develop exercises for the RND Program
- Administer and manage RND Program exercises
- Ensure exercises align with equipment and training
- Test and evaluate the effectiveness of Program exercises

- Create and manage an exercise budget
- Understand additional grant and funding considerations specific to RND Program exercises

Operations Support

- Define RND Program operations support goals
- Identify factors that may influence the types of resources and systems necessary to accomplish operations support goals
- Identify operations support resources that can be used for the RND Program
- Develop a strategy for engaging RND Program operations support resources
- Develop processes and procedures for alarm adjudication
- Determine systems necessary for information and intelligence sharing
- Determine mechanisms to evaluate and continuously improve operations support
- Create and manage an operations support budget
- Understand current grant and funding processes relevant to RND Program operations support