

# *Domestic Nuclear Detection Office (DNDO)*

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## *Model Guidelines for Nuclear Detection Architectures*

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Homeland  
Security

# Overview

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- The importance of nuclear detection
- Concept of nuclear detection architectures
- Model Guidelines Document for Nuclear Detection Architectures – a contribution to meeting the challenges
- Path Ahead

# *Background and Context*

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- **Global Partnership:** dedicated to preventing catastrophic terrorism and the proliferation of WMD
- **Proliferation Security Initiative**
- **UNSCR 1540:** Obliges States to refrain from supporting by any means non-State actors from developing, acquiring, manufacturing, possessing, transporting, transferring, or using nuclear, chemical or biological weapons and their delivery systems
- **Global Initiative to Combat Nuclear Terrorism:** calls on partner nations to enhance efforts to effectively combat nuclear and radiological terrorism.
  - Launched at the G8 Summit in 2006
  - Principle 3: calls on all nations to “improve the ability to detect nuclear and other radioactive materials and substances, to include cooperation in the research and development of national detection capabilities that would be interoperable”

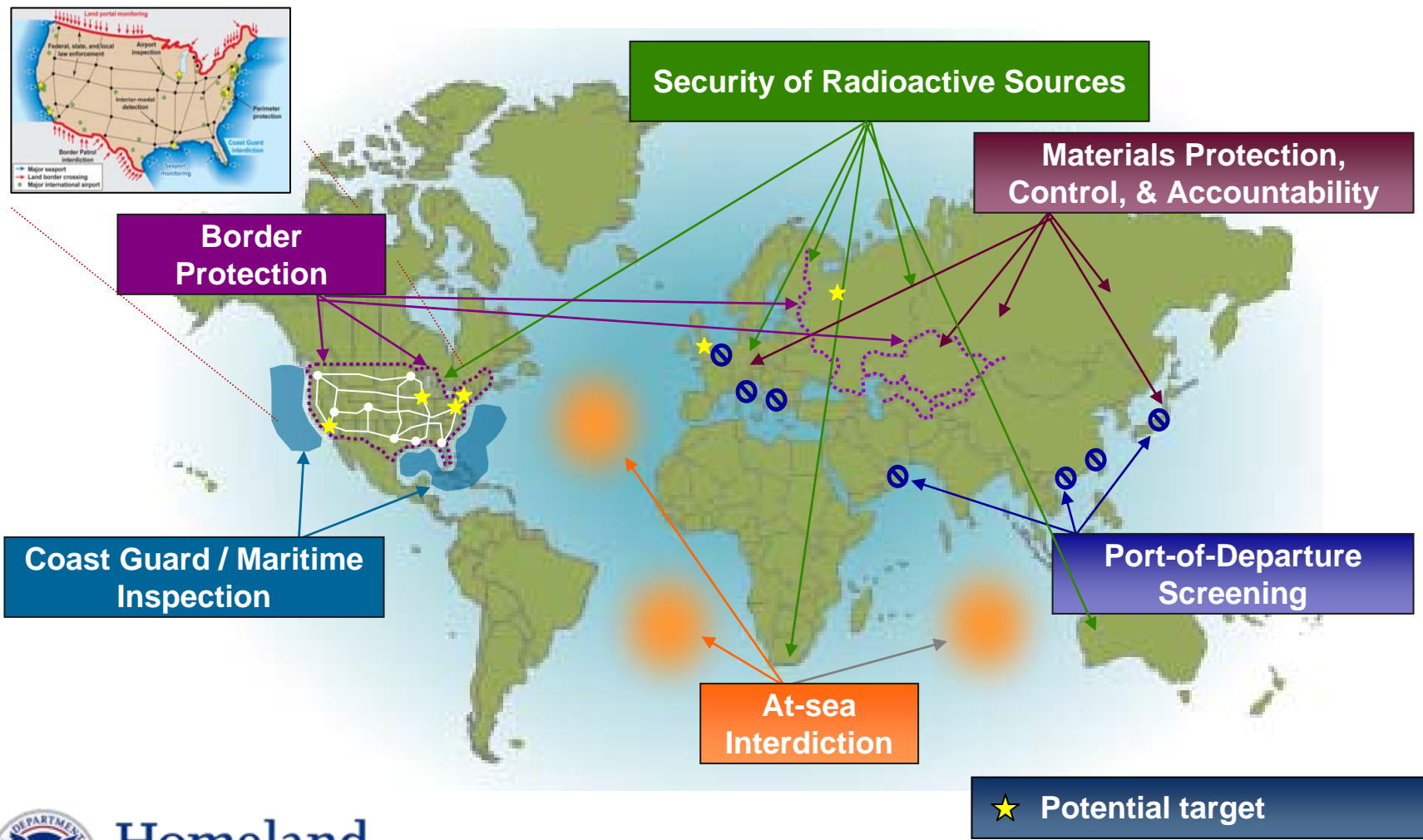
# *What is a Nuclear Detection Architecture?*

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- Comprehensive set of detection systems and associated resources and infrastructure intended to improve the capability to detect and interdict nuclear and radiological threats
  - Time-phased
  - Integrated within a larger national and international security framework
  - Comprised of multiple layers
  - Risk informed, balanced and distributed across layers
  - Adaptive
  
- Ultimate goal – **reduce risk** of terrorist attack and minimize consequences

# Global Nuclear Detection Architecture

A multi-layered international system offers multiple opportunities for detection



# *Rationale for Model Guidelines Document*

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- Build on existing detection efforts worldwide
- Raise overall awareness
- “Improve ability to detect nuclear and other radioactive materials and substances in order to prevent illicit trafficking” - GI Principle 3
- Communicate fundamental concepts and principles
  - Explain basic elements of a nuclear detection architecture
    - National-level approach – integrated with larger national and international security frameworks
    - Structural
    - Technical
    - Informational
  - Underscore need for a layered, defense-in-depth approach
  - Serve as strategic planning guide to assist nations in developing and enhancing their own detection capabilities



# *National Level Approach*

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- Nuclear detection architectures based on over-arching national strategy
  - Characterization and analysis of threat
  - Sound legal and regulatory basis
  - Tailored to specific circumstances of each nation
  - Endorsed by national leadership
  
- Build upon current national capabilities
  - Physical protection / source security
  - Customs and border protection – effective targeting / risk management
  - Technical specialists integrated into effective reach-back process
  - Law enforcement – integrated at national, regional and local levels
  - Private sector capabilities

# *Structural Elements of a National Architecture*

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- Includes multiple detection layers to effectively counter threats
- Geographic layers
  - Exterior threats
  - Borders
  - National interior
- Pathways
  - Air
  - Maritime
  - Land – both at official Points of Entry and unofficial “green” border crossing points
- Cross-cutting elements that tie layers and pathways together
  - Nuclear forensics
  - Operations and analysis centers
  - Technical reach-back





# *Technical Elements*

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- Technology plays critical role in development and implementation of effective architectures
- Human factor equally important
- Investment in technology informed by operational requirements and constraints
  - Active, passive, mobile systems
- Investment evaluated against performance goals / targets for operations in realistic environments
- Requirements definition must incorporate systems approach
  - Initial costs – R&D, production, etc.
  - Life-cycle costs
  - Physical footprint

# *Role of Information*

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- Effective information flow / use important
- Networked system approach recommended
- Integration of all source data through data “fusion centers”
- Effective dissemination of data / information equally important
  - Common data formats and testing protocols
  - Ensures timely response and technical reach-back
- Information security required to preserve confidentiality, integrity and availability of data

# *Implementing Framework*

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- Planning, Roles and Responsibilities
- Training and Exercises
- Response and Reach-Back Protocols
- Operations Support and Sustainability

# *Conclusions on The Path Ahead*

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- Terrorism and nuclear smuggling are transnational threats that may exploit shared pathways of global trade and communication
- Focus has largely been on official border checkpoints, containerized shipping, physical security
- Additional emphasis is needed to “build out” national-level capabilities
  - Focus on lesser-developed areas; e.g. coastal maritime, aviation, land borders
- Regional approach potentially offers greater efficiencies
  - National-level architectures – infrastructure to support
- Cooperative, integrated efforts more effective than unilateral efforts
  - Comparing operational experience
  - Developing common systems, evaluation criteria
  - Exploring common R&D objectives

# *Next Steps: Practical Adaptation*

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- Technical Workshop on “Model Guidelines for Nuclear Detection Architectures”
  - 20-22 April 2009, Garmisch, Germany
  - 44 + participants
  - 20 + countries
  - Outcome: finalize document and discuss practical adaptation
- Model Guidelines Document posted on Global Initiative Information Portal
  - <https://global-initiative.info/>

## **Point of Contact**

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