

CBRNE DETECTION

Capability Definition

The Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Detection capability provides the ability to detect CBRNE materials at points of manufacture, transportation, and use. This capability includes the detection of CBRNE material through area monitoring, but not by their effects (i.e., signs or symptoms) on humans and animals which is addressed through the public and animal health capabilities. The CBRNE Detection capability does not include actions taken to respond to the consequences of a release or activities to render any CBRNE device safe.

The CBRNE Detection capability is not only about technology, but rather the ability to recognize potential CBRNE threats through equipment, education, and effective protocols. The importance of training, communication, and close coordination with key partners, including intelligence, law enforcement, public safety, public health, and international partners, is recognized as a critical enabler for this capability. However, only the CBRNE detection specific tasks to these cross-cutting elements have been identified in this capability.

Definitions are as follows:

Manufacture: The illegal production of CBRNE material within the borders of the U.S. and its territories.

Transport: The movement of CBRNE material outside, across, and within the borders of the U.S. and its territories.

Use: The deployment, emplacement, or employment of CBRNE material within the U.S. and its territories.

Outcome

Chemical, biological, radiological, nuclear, and/or explosive (CBRNE) materials are rapidly detected and characterized at borders, critical locations, events, and incidents.

Relationship to National Response Plan Emergency Support Function (ESF)/Annex

This capability supports the following Emergency Support Functions (ESFs) and Annex:

ESF #1: Transportation

ESF #2: Communications

ESF #3: Public Works and Engineering

ESF #5: Emergency Management

ESF #8: Public Health and Medical Services

ESF#10: Oil and Hazardous Materials Response

ESF #11: Agriculture and Natural Resources

ESF #12: Energy

ESF #13: Public Safety and Security

Terrorism Incident Law Enforcement and Investigation Annex

Preparedness Tasks and Measures/Metrics

Although the tables below use the term “CBRNE” generically, the process should be applied separately for each chemical, biological, radiological, nuclear, and explosive threat category.

Activity: Develop and Maintain Plans, Procedures, Programs and Systems	
Critical Tasks	
Pre.A1e 1.7	Develop procedures to facilitate the exchange of information and data among Federal, State, local and tribal agencies
Pre.A1e 1.8	Establish policies and procedures for communications and warnings pertaining to CBRNE
Pre.A1e 1.9	Establish and maintain interoperable information network
Pre.A1e 1.5	Establish coordination and/or mutual aid agreements with external CBRNE detection and alarm resolution capabilities
Pre.A1e 1.10	Conduct CBRNE detection requirements analysis for critical infrastructure/key resources (CI/KR)
Pre.A1e 1.11	Develop regional CBRNE coordination plans or activities that involve all Federal, State, local, tribal and private stakeholders
Pre.A1e 1.12	Research and develop technologies for detecting chemical, biological, radiological, nuclear and explosive material
Pre.A1e 1.13	Develop and implement equipment acquisition and certification standards
Pre.A1e 1.14	Develop technology standards for government and private sector
Pre.A1e 1.1	Develop standards for CBRNE detection technologies, including sensitivity and selectivity standards
Pre.A1e 1.6	Establish key personnel training standards for CBRNE detection
Pre.A1e 1.2	Develop and implement global standards for cargo screening for CBRNE material
Pre.A1e 1.15	Validate analytical methods to detect chemical, biological, radiological, nuclear, and explosive material
Pre.A1e 1.16	Assess prioritized critical infrastructure/key resources (CI/KR) for CBRNE detection requirement
Preparedness Measures	Metrics
Technological shortfalls in CBRNE detection have been identified	Yes/No
A research and development program is in place to address the CBRNE detection technological shortfalls	Yes/No
There is a program for the timely development of standards for emerging technology	Yes/No
A process has been developed to identify and integrate appropriate technology in operational environments	Yes/No
Appropriate personnel have been identified for CBRNE detection training, to include: <ul style="list-style-type: none"> ▪ Law enforcement personnel ▪ Transit police and security ▪ Fire personnel, HazMat personnel ▪ Public health professionals 	Yes/No Yes/No Yes/No Yes/No

<ul style="list-style-type: none"> ▪ Private sector security ▪ Critical infrastructure employees ▪ Others as deemed appropriate 	Yes/No
	Yes/No
	Yes/No
CBRNE technical support is available (on-site or through “reach back”)	Yes/No
A standard list of CBRNE threats of concern has been developed	Yes/No
Appropriate levels of CBRNE detection sensitivity have been identified for the identified threats of concern	Yes/No
CBRNE detection sensitivity thresholds comply with appropriate international, national, State, and local standards	Yes/No
Detection/surveillance thresholds have been set to the specified level of sensitivity	Yes/No
Key CBRNE detection interdiction points have been identified	Yes/No
Frequency with which key interdiction points are assessed and updated	Annually
A regional CBRNE detection plan has been developed and coordinated	Yes/No
Protocols exist for resolving CBRNE detection alarms	Yes/No
Protocols have been developed and incorporated in plans to communicate CBRNE detection activities, locations, anomalies and their resolution to appropriate personnel (e.g., intelligence, law enforcement, and public health communities)	Yes/No
Frequency at which protocols have been exercised and evaluated	Annually
Frequency at which CBRNE detection plans are updated to reflect current critical infrastructure/key resources (CI/KR) assessments	Annually
Appropriate procedures exist for detection capabilities at critical infrastructure/key resources (CI/KR) for specific CBRNE threat conditions	Yes/No
Integrated CBRNE detection architectures exist for all levels of government (Federal, State, local, tribal)	Yes/No
CBRNE detection interdiction sites have been assessed for potential circumvention	Yes/No

Activity: Develop and Maintain Training and Exercise Programs

Critical Tasks

Pre.A1e 2.1.1	Develop and implement training to enable personnel to recognize the presence of CBRNE material (e.g., first responders, law enforcement, intelligence, and medical community)	
Pre.A1e 2.1.3	Provide CBRNE support equipment and threat device handling training to operations and investigation personnel	
Pre.A1e 2.2.1	Test and exercise CBRNE detection and resolution protocols regularly	
Preparedness Measures		Metric
Awareness level training has been provided for first responders		Yes/No
A program is in place to test and evaluate new technology in the appropriate operational environment		Yes/No
CBRNE detection training materials have been developed and validated		Yes/No
Percent of required personnel trained to meet jurisdictional CBRNE detection requirements		100%
Public education campaigns exist for CBRNE detection		Yes/No
The regional CBRNE detection plan has been exercised in accordance to the Homeland Security Exercise and Evaluation Program (HSEEP) guidance		Yes/No
Frequency CBRNE detection notification plan is exercised		Quarterly

Performance Tasks and Measures/Metrics

Activity: Detect	
Definition: Detect CBRNE material at points of manufacture, transportation, and use	
Critical Tasks	
Pre.A1e 3.1	Publish and distribute CBRNE detection awareness material
Pre.A1e 3.1.3	Identify CBRNE material at points of illegal manufacture, transportation, or use within and across the borders of the U.S. and its Territories
Pre.A1e 3.2.2.4	Detect the use of CBRNE material in a community and/or venue
Pre.A1e 3.2.2.2	Conduct ad hoc CBRNE material detection in a community and/or venue
Pre.A1e 3.2.2.3	Conduct continuous CBRNE material detection in a community and/or venue
Pre.A1e 3.2.2.5	Detect illegal manufacturing of CBRNE material at potential manufacturing sites
Pre.A1e 3.2.2.6	Detect CBRNE material on personnel or items entering/boarding events, aircraft, mass transit, or other high impact targets
Pre.A1e 3.1.4	Identify material at key interdiction points requiring further inspection
Pre.A1e 3.2.2.7	Detect the ground, air, and sea transport and/or deployment of CBRNE material into and within the U.S. and its Territories
Pre.A1e 3.3.2	Provide stand-off detection technologies
Pre.A1e 3.3.3	Provide point detection technologies
Pre.A1e 3.1.1	Implement CBRNE detection and awareness programs for the public, private sector and key personnel (to include: safety and security personnel, law enforcement personnel, first response personnel, and the intelligence community)
Pre.A1e 3.2.1.5	Inspect and monitor cargo at key interdiction points for potential CBRNE material
Pre.A1e 3.2.1	Investigate a venue for the possible emplacement of a CBRNE device

Pre.A1e 3.2.1.2	Use intelligence information to focus CBRNE material searches and surveillance activities
Pre.A1e 3.2.1.3	Use medical information (e.g., syndromic surveillance and medical diagnostic tests) to focus CBRNE detection capabilities
Pre.A1e 3.4.1.1	Screen people to detect CBRNE material at all ports of entry and at all critical infrastructure/key resources (CI/KR)
Pre.A1e 3.3.1	Prioritize CBRNE detection technology solution standards
Pre.A1e 3.2.2.1	Implement protocols for resolving CBRNE alarms and the detection of suspect material
Pre.A1e 3.4.1.1	Screen material (e.g., baggage, mail, etc.) to detect CBRNE material at all ports of entry (e.g., sea and airports, border crossing points, etc.) and critical infrastructure/key resources (CI/KR)
Pre.A1e 3.2.1.1	Use intelligence information to target suspect containers or shipments

Performance Measures	Metrics
Illicit chemical, biological, radiological, or explosive material are detected at borders, inspection points, or during routine law enforcement investigations	Yes/No
Surveillance systems provide early detection of a chemical, biological, or radiological release that would facilitate limiting the spread and effect of that release	Yes/No
Checked baggage and cargo entering/boarding events, aircraft, mass transit, or other potential targets are screened	Yes/No
Passengers and event attendees entering/boarding events, aircraft, mass transit, or other potential targets are screened	Yes/No
CBRNE detection interdiction sites have been assessed for potential circumvention	Yes/No
CBRNE detection efforts are informed by intelligence, public safety, and public health information	Yes/No
Venues are inspected for potential CBRNE threats prior to major events	Yes/No
Ad hoc CBRNE surveillance capabilities are deployed in response to potential threats	Yes/No

Activity: *Confirm and Characterize*

Definition: Describe or portray the qualities of detected CBRNE material

Critical Tasks

Pre.A1e 4.1	Confirm and characterize CBRNE material used in a community and/or venue
Pre.A1e 4.2	Provide CBRNE material detection information that can be used for attribution efforts to appropriate personnel to include: law enforcement and intelligence community personnel

Performance Measures	Metrics
Accurate records are kept of all suspect issues or alarms and their resolution	Yes/No
Suspicious material is analyzed (either on-site or via laboratory support)	Yes/No
Percent of CBRNE alarms, or suspect material discoveries, at interdiction points that are resolved	100%

Activity: *Communicate CBRNE Detection Incidents*

Definition: Provide CBRNE warning information to appropriate capabilities.

Critical Tasks

Pre.A1e 5.1.1	Coordinate CBRNE material threat and discovery information with intelligence, public safety, public health and other appropriate agencies
Pre.A1e 5.2	Provide CBRNE data to appropriate personnel, to include: intelligence community, law enforcement personnel, first responders, and the general public

Performance Measures	Metrics
Disseminated information in event of CBRNE detection follows established protocol	Yes/No

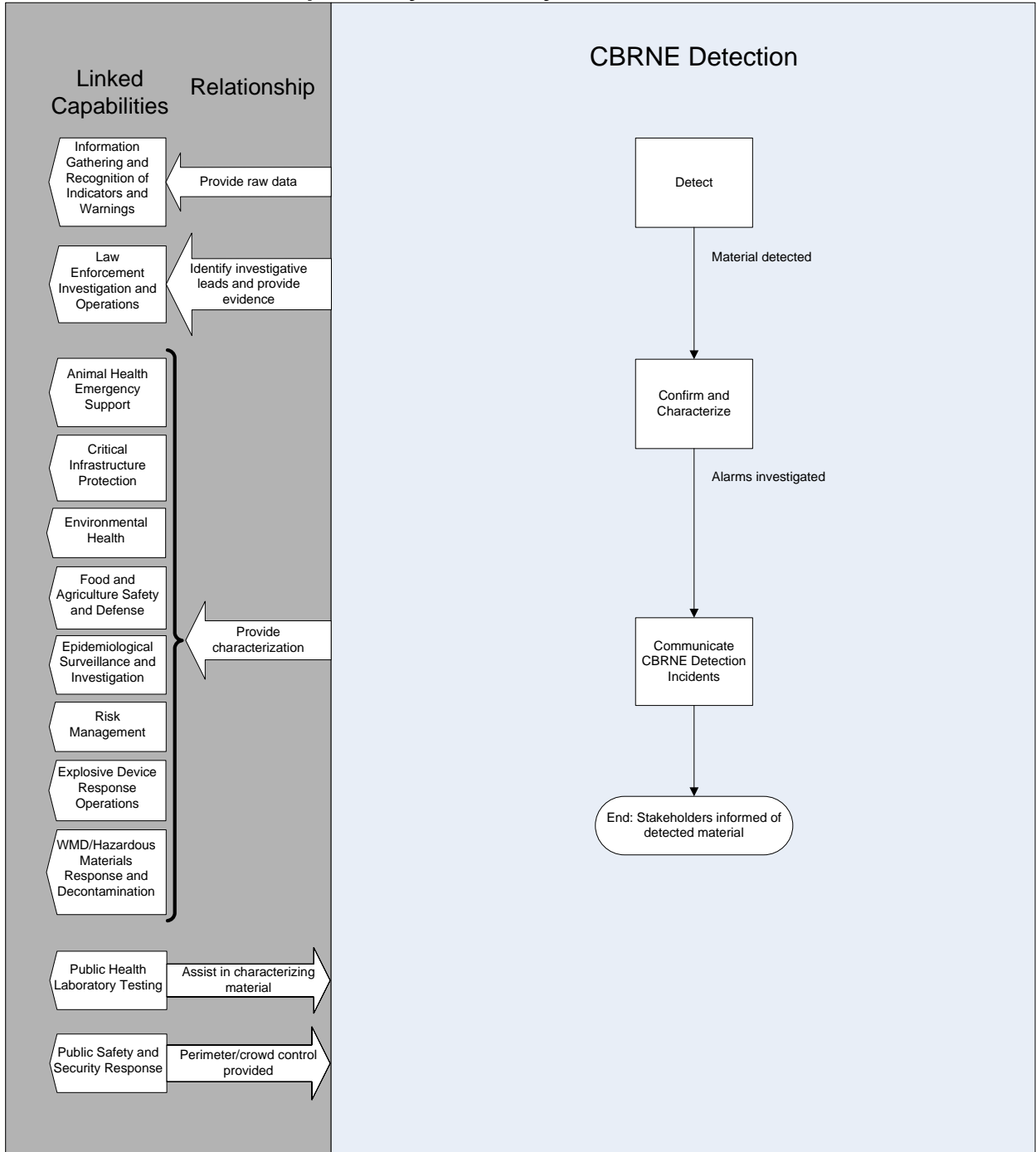
CBRNE detection notification was done in accordance with plan	Yes/No
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Linked Capabilities

Linked Capability	Relationship to Capability
Animal Health Emergency Support	Data on detection and characterization of CBRNE may inform animal health monitoring and/or protection activities
Communications	As with all capabilities, linkage with communications is critical component for dissemination of information
Community Preparedness and Participation	Public awareness is a critical part of any CBRNE detection effort
Critical Infrastructure Protection	Data on detection and characterization of CBRNE may inform critical infrastructure protection activities
Economic and Community Recovery	Monitoring programs are linked to mitigation measures that limit economic and community impact
Environmental Health	CBRNE Detection provides material characterization to Environmental Health
Epidemiological Surveillance and Investigation	Data on potential CBRNE threats and characterization may inform epidemiological monitoring activities; similarly, results of epidemiological monitoring may indicate a CBRNE threat
Explosive Device Response Operations	Detection of CBRNE provides material characterization and may trigger the need for Explosive Device Response Operations
Fatality Management	Timely detection and characterization of material and effective information sharing aids Fatality Management planning and operations
Food and Agriculture Safety and Defense	Data on detection and characterization of CBRNE threats may inform food safety monitoring and/or protection activities, similarly, results of food and agricultural monitoring may indicate a CBRNE threat
Information Gathering and Recognition of Indicators and Warnings	CBRNE detection data is one source of raw information collected by the Information Gathering capability
Intelligence/Information Sharing and Dissemination	CBRNE detection may occur through the information sharing mechanisms established by the Intelligence/Information sharing capability
Intelligence Analysis and Production	CBRNE detection data is one source of information collected and analyzed by the Intelligence Analysis and Production Capability
Law Enforcement Investigation and Operations	Detection of CBRNE may trigger the need for a law enforcement investigation, and affect how it is conducted
Medical Surge	Timely detection and characterization of material and effective information sharing aids Medical Surge planning and operations
Planning	Creation of Incident Action Plans for immediate implementation that enable closer coordination
Public Health Laboratory Testing	Results from laboratory testing may indicate potential CBRNE threats. CBRNE Detection may receive assistance in characterizing

Linked Capability	Relationship to Capability
	the detected material from Public Health Laboratory Testing
Public Safety and Security Response	Evidence of CBRNE may trigger the need for public safety and security response for site control. CBRNE Detection receives perimeter and crowd control from Public Safety and Security Response
Restoration of Lifelines	CBRNE Detection may provide information on the hazard encountered and lifelines affected. Lifelines enables the CBRNE Detection Capability to function
Risk Management	Timely detection and characterization of material and effective information sharing aids Risk Management planning and operations
Triage and Pre-Hospital Treatment	Timely detection and characterization of material and effective information sharing aids Triage and Pre-Hospital Treatment planning and operations
WMD/Hazardous Materials Response and Decontamination	Detection of CBRNE materials may trigger the need for WMD/Hazardous Materials Response and Decontamination

Capability Activity Process Flow



Capability Element Description Details

Capability Elements	Components and Description
CBRNE detection operator personnel	Specially trained and equipped personnel with the ability to recognize potential CBRNE threats through equipment, education, and effective protocols
Explosive Detection Dog (EDD) Teams	A canine and handler, working as a team to perform explosive detection searches of building and office areas, vehicles, packages, materials and persons
Laboratory staff for agent identification	Personnel specially trained and equipped to analyze suspicious materials in support of criminal investigations
Border control and other targeted `defense layers` personnel	Personnel involved in screening materials (e.g., baggage, mail, etc.) to detect CBRNE material at all ports of entry (e.g., sea and airports, border crossing points, etc.) and critical infrastructure/key resources (CI/KR)
Appropriate critical infrastructure personnel	Critical infrastructure employees who have been identified for CBRNE detection training
Local emergency responders	Personnel from law enforcement, fire services, medical communities and other disciplines involved in responding to an incident
CBRNE detection technology R&D	
Protocols to ensure coordination with intelligence community	
Public education program to help people recognize threats	
CBRNE detection and monitoring equipment	
Training for personnel at interdiction points	
Laboratory testing equipment	
Mutual aid agreements and/or memoranda of understanding (MAAs/MOUs), including protocols for coordination with intelligence community	
CBRNE detection standard operating procedures, including regional coordination plans and protocols for resolving alarms	
Facility response plans as required by law (SARA Title III)	

Planning Assumptions

Target Capabilities List

- Although applicable to several of the 15 National Planning Scenarios, the capability planning factors were developed from an in-depth analysis of the scenarios featuring an improvised explosives device, a chlorine tank explosion, aerosol anthrax, an improvised nuclear device, and a radiological dispersal. Other scenarios were reviewed to identify required adjustments or additions to the planning factors and national targets.
- CBRNE detection activities apply to the U.S. and its territories.
- The CBRNE detection capability addresses biological agents outside of the body (human and animal), and does not include medical or plant samples (i.e., blood and medical tests). Medical and syndromic surveillance detection of biological agents is addressed in the public health and food and agriculture safety capabilities and close integration of these capabilities must occur.
- Prevention consists of those activities that serve to detect, deter, and disrupt terrorist threats or actions against the United States and its interests. These activities decrease the perpetrators' chance of success, mitigate attack impact, minimize attack visibility, increase the chance of apprehension or detection, and obstruct perpetrators' access to resources. Tasks in this area are important regardless of a single type of threat, adversary capability, time or location of incident. Similarly, these capabilities reflect many tasks routinely undertaken by law enforcement and related organizations as they conduct traditional all-hazards, all-crimes activities.
- Effective prevention depends on timely, accurate, and actionable information about the adversary, their operations, their support, potential targets, and methods of attack. Homeland security intelligence/information fusion is the overarching process of managing the development and flow of information and intelligence across all levels and sectors of government and the private sector on a continual basis. Although the primary emphasis of fusion is to identify, deter, and respond to emerging terrorism-related threats and risks, a collateral benefit to Federal, State, local, and tribal entities is that it will support ongoing efforts to address non-terrorism-related, all-hazards, all-crimes issues.
- Both the Planning Factors from an In-Depth Analysis of a Scenario with Significant Demand for the capability section and the Approaches for Large-Scale Events section have been omitted because there is no incident or large-scale event that necessarily occurs before these capabilities come in to play.
- Intelligence/information fusion is an ongoing, cyclical process that incorporates three primary capabilities: Information Gathering and Recognition of Indicators and Warnings; Intelligence Analysis and Production; and Intelligence/Information Sharing and Dissemination. The CBRNE Detection capability relates closely to all three stages of this process.
- All appropriate objectives and critical tasks will be exercised regularly at all levels in order to measure performance and demonstrate capability.

Planning Factors from an In-Depth Analysis of a Scenario with Significant Demand for the Capability

Not Applicable

National Targets and Assigned Levels

Responsible	Element Resource Unit	Type of Element	Number of Units	Unit Measure (number per x)	Capability Activity supported by Element
Federal, State, Local, Tribal	CBRNE detection operator personnel	Personnel	Varies by Region	Varies by Region	Detect
Federal	Explosive Detection Dog (EDD) Teams	Personnel and canine	Varies by Region	Varies by Region	Detect
Federal, State, Local, Tribal	Laboratory staff for agent identification	Personnel	Varies by Region	Varies by Region	Characterize
Federal and State	Border control and other targeted `defense layers` personnel	Personnel	Varies by Region	Varies by Region	Detect
Private Sector	Appropriate critical infrastructure personnel	Personnel	Varies by Region	Varies by Region	Detect
Local	Local emergency responders	Personnel	Varies by Region	Varies by Region	Detect Characterize
Federal	CBRNE detection technology R&D	Organization and Leadership	Varies by Region	Varies by Region	All Activities
Federal, State, Local, Tribal	Protocols to ensure coordination with intelligence community	Planning	Varies by Region	Varies by Region	Warn
Federal, State, Local, Tribal	Public education program to help people recognize threats	Training	Varies by Region	Varies by Region	Detect
Federal, State, Local, Tribal	CBRNE detection and monitoring equipment	Equipment	Varies by Region	Varies by Region	Detect Characterize
Federal, State, Local, Tribal	Training for personnel at interdiction points	Training	Varies by Region	Varies by Region	Detect

Responsible	Element Resource Unit	Type of Element	Number of Units	Unit Measure (number per x)	Capability Activity supported by Element
Federal, Regional, State, and Local	Laboratory testing equipment	Equipment	Varies by Region	Varies by Region	Characterize
Federal, Regional, State, Local, tribal, Private	Mutual aid agreements and/or memoranda of understanding (MAAs/MOUs), including protocols for coordination with intelligence community	Planning	Varies by Region	Varies by Region	All Activities
Federal, Regional, State, Local, Tribal	CBRNE detection standard operating procedures, including regional coordination plans and protocols for resolving alarms	Planning	Varies by Region	Varies by Region	Detect Characterize
Federal, Regional, State, Local, Tribal, Private	Facility response plans as required by law (SARA Title III)	Planning	Varies by Region	Varies by Region	Detect

References

1. *National Response Plan*. U.S. Department of Homeland Security. December 2004.
2. *National Incident Management System*. U.S. Department of Homeland Security. March 2004. <http://www.dhs.gov/interweb/assetlibrary/NIMS-90-web.pdf>.
3. Homeland Security Presidential Directive/HSPD-8: National Preparedness. December 2003. <http://www.whitehouse.gov/news/releases/2003/12/20031217-6.html>.
4. Homeland Security Presidential Directive/HSPD-7: Critical Infrastructure Identification, Prioritization and Protection.
5. *Hazardous Materials Emergency Planning Guide*. National Response Team. 2001. http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9765.
6. Hazardous Waste Operations and Emergency Response, 29 CFR 1910.120. Occupational Safety and Health Administration. November 2002. http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9765.