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Department of Defense Chemical and Biological Defense Program

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Executive Summary

The Department of Defense (DoD) Chemical and Biological Defense Program (CBDP) mission is to enable the Warfighter to deter, prevent, protect, mitigate, respond, and recover from chemical, biological, radiological, and nuclear (CBRN) threats and effects as part of a layered, integrated defense. To support this mission, the CBDP has four enduring strategic goals that define the desired programmatic end-states for the program and its Enterprise Components:

1. Equip the force to successfully conduct military operations to prevent, protect, and respond to CBRN threats and effects.
2. Prevent surprise by anticipating CBRN threats and developing new capabilities for the Warfighter to counter emerging threats.
3. Maintain infrastructure to meet and adapt current and future needs for personnel, equipment, and facilities within funding constraints.
4. Lead the CBDP Enterprise to integrate and align activities to fulfill the CBDP mission.

Among a range of important achievements, the CBDP continues to focus on four efforts that are essential for a robust defense:

1. Medical Countermeasure (MCM) Development. The DoD invests in MCMs to pre-treat, protect, and treat the Warfighter against chemical and biological (CB) threats. Several federal agencies collaborate to deliver MCMs to those affected at the right time in adequate supply. DoD is focused on protecting forces against disease in theaters of operation and against weaponized CB threats.
2. Diagnostics. The DoD invests in chemical, biological, and/or radiological (CBR) detectors and diagnostics to protect the Warfighter by quickly and effectively identifying, characterizing, and diagnosing pathogens and diseases to inform timely and appropriate treatment.
3. Biosurveillance. The DoD is investing in a biosurveillance capability that will mitigate the threat from CBR events (intentional, accidental, or naturally occurring) by informing leadership with essential information to support decision making in a timely manner through a technical architecture made up of disease surveillance tools, to include fielding capable diagnostic, detection, and information management and analytics technologies.
4. Non-Traditional Agent (NTA) Defense Capabilities. The DoD continues investments in NTA defense capabilities in support of the Warfighter and our broader national security objectives. In support of the *National NTA Defense Research, Development, Test and Evaluation (RDT&E) Strategy*, dated October 2010, efforts are to provide and enhance capabilities to mitigate the threat from non-traditional and emerging chemical threats. DoD is committed to developing NTA defense capabilities in our priority areas of detection, MCMs, decontamination, and protection.

These efforts and the other critical work to defend against CBR threats conducted by the CBDP enable deterrence, prevention, protection, mitigation, response, and recovery from CBR attacks in defense of the Warfighter and the nation.

Introduction

CBR threats are dynamic and continue to evolve. The rapid advancement and global proliferation of CB capabilities greatly extends the spectrum of plausible actors, agents, concepts of use, and targets. These advancements enable our nation's adversaries to develop unique CBR threats with the intent of circumventing our current defenses. To ensure an effective response to these threats, the DoD CBDP continuously and actively develops defensive capabilities to stay ahead of developing threats. The DoD 2013 Annual Report to Congress on CB warfare defense provides the status of the Department's overall readiness to detect, prevent, and mitigate the threat, as required by section 1523, title 50 U.S. Code (section 1523).¹

This report addresses the requirements of section 1523, while highlighting CBDP Fiscal Year (FY) 2012 accomplishments in MCMs, diagnostics, biosurveillance, and NTA defense. It is organized to document requirements integration and accomplishments in science and technology (S&T); research, development, and acquisition (RDA); and interagency partnerships that advanced readiness for Warfighters and the nation in FY 2012. In response to the 2010 *Quadrennial Defense Review*, the CBDP significantly increased its interagency activities in FY 2012 to eliminate redundancy and capitalize on the strengths and contributions of each agency. The CBDP's interagency collaborations based on CBRN defense technical efforts ensure a unified approach that supports our mission. This report cites important advancements in scientific research and materiel development, followed by highlights for test and evaluation (T&E); policy, training, and education; Chemical Weapons Convention (CWC) and Biological Weapons Convention (BWC) inspection readiness; and international collaboration. The report closes with a discussion of initiatives and efforts to further integrate and align the program in an end-to-end manner.

The CBDP published a new strategy in 2012 to address current defense policy set by public law, national strategies, Departmental Directives and Instructions, and senior leadership guidance. The CBDP's vision is a DoD that addresses CBRN threats and minimizes their effects, and its mission is to enable the Warfighter to deter, prevent, protect, mitigate, respond, and recover from CBRN threats and effects as part of a layered, integrated defense. To support the vision and mission, the CBDP has four enduring strategic goals that define the desired programmatic end-states for the program and its Enterprise Components:

1. Equip the force to successfully conduct military operations to prevent, protect, and respond to CBRN threats and effects.
2. Prevent surprise by anticipating CBRN threats and developing new capabilities for the Warfighter to counter emerging threats.
3. Maintain infrastructure to meet and adapt current and future needs for personnel, equipment, and facilities within funding constraints.
4. Lead the Enterprise to integrate and align activities to fulfill the CBDP mission.

Throughout 2012, the following objectives guided our efforts to accomplish the *CBDP Strategic Plan* goals:

¹ Title 50 U.S. Code Section 1523, (a) 1: The overall readiness of the Armed Forces to fight in a chemical-biological warfare environment and shall describe steps taken and planned to be taken to improve such readiness.

- Establish a robust MCM pipeline from requirements definition, through RDT&E and U.S. Food and Drug Administration (FDA) approval, to manufacturing and distribution. This pipeline will focus on mitigating current CBR threats using platform technologies capable of expediting responses to validated known and emerging threats.
- Develop and field suitable, effective, and affordable broad-spectrum point-of-need (PON)/point-of-care (POC) diagnostic systems synergistic with detection capabilities to understand and address current and emerging CBR threats to enable rapid force protection and other operational decisions.
- Provide CBRN defense capabilities to support biosurveillance efforts and enable the Warfighter to achieve information dominance in the CBR domain.
- Integrate NTA defense capabilities into future CB defense systems, as appropriate.
- Maintain critical capabilities and competencies, aligned with RDA priorities, to rapidly develop, test, and field CBRN individual protection and collective protection (ColPro) capabilities to the Warfighter.
- Implement risk-based planning and decision-making processes.

In 2012, the CBDP continued to effectively meet the current highest priority needs for DoD CBR defense solutions while shifting to establish the agility and flexibility necessary to rapidly adapt to the evolving strategic landscape. This ongoing transformation ensures that currently available technologies are produced, procured, and rapidly provided and that cutting-edge technologies are harnessed to provide improved capabilities for the future. The DoD CBDP continued to enhance CBRN readiness to counter known and emerging threats and collaborated with other Government agencies to foster exchange of knowledge and coordination of CB defense-related activities in a whole-of-government fashion. The CBDP is a Joint Force enabler fulfilling the needs of the Warfighters to ensure that they are trained, equipped, and resourced to complete missions in CBR environments now and in the future, preserving the security and freedom of our nation.

Requirements Integration

On behalf of the Chairman of the Joint Chiefs of Staff (CJCS), the Joint Requirements Office for Chemical, Biological, Radiological, and Nuclear Defense (JRO-CBRND) plans, coordinates, and approves Joint CBRN defense operational requirements, Joint operational concepts, and architectures for passive defense, consequence management (CM), force protection, and Defense Support of Civil Authorities (DSCA). With input from the Services, Combatant Commands, and Joint Staff-led Capabilities Based Assessments (CBA), a Joint Priority List (JPL) of CBRN core capabilities is developed annually. The JPL informs the Joint Capabilities Integration and Development System, CBDP resource allocation, and DoD efforts in S&T research and development (R&D) of materiel and non-materiel solutions that enable military operations. Additionally, JRO-CBRND conducts experiments and studies in support of Joint CBRN defense operational requirements, which are listed in Enclosure B.²

The *2012 Modernization Plan for CBRN Defense* was developed to inform CBRN defense requirements integration by supporting Joint, multi-Service, and individual Service doctrine, training, materiel, and leader development and education. Further aligning the program to integrate Service and Combatant

² Title 50 U.S. Code Section 1523, (a) 2: Requirements for the chemical and biological warfare defense program, including requirements for training, detection, and protective equipment, for medical prophylaxis, and for treatment of casualties resulting from use of chemical or biological weapons.

Command requirements, the 2012 JPL established a prioritized list of the 29 CBRN core capabilities required to achieve Joint Force military strategies.³

Advances in Diagnostics

Program/Effort Description

PON diagnostics provides the Warfighter with rapid on-site biological warfare agent (BWA), chemical warfare agent (CWA), and emerging infectious disease (EID) identification and analysis capabilities for medical treatment. The desired end-state of advancements in diagnostics and analytics is synergistic physical and medical capabilities that continuously provide Warfighters, commanders, civilians, and other federal agencies with information about the CBR situation by detecting, identifying, classifying, and quantifying solid, liquid, gaseous, and aerosol CBR hazards in clinical samples, air, water, and facilities as well as on personnel, equipment, and surfaces. Examples of FY 2012 accomplishments are detailed below.

Science and Technology

The Defense Threat Reduction Agency's (DTRA) Joint Science and Technology Office for Chemical and Biological Defense (JSTO-CBD) completed phase I of the 24-Month Diagnostic Challenge, intended to produce both a handheld diagnostic device that provides quick-screen exposure-detection capability and a more analytical, confirmatory-level capability to be used by medically trained personnel. Twelve devices were evaluated, and four continued to phase II, which will further equip these devices with a wireless capability to upload diagnostic results, in real-time, directly to an informatics-based Biosurveillance Ecosystem (BSVE). The completed capability will be demonstrated by deploying devices with assays and diagnostic methods to three locations outside the continental United States (OCONUS). Additionally, the CBDDP is collaborating with the Department of Homeland Security (DHS) in the key area of advancing highly specific, highly sensitive, easy-to-use, affordable, and sustainable rapid detection technologies that have multiplexed capabilities to support pre- and post-symptomatic detection/diagnosis. Additional efforts are being advanced and established with new diagnostic collaborations with the U.S. Centers for Disease Control and Prevention (CDC).

Research, Development, and Acquisition

In FY 2012, development efforts supported the Next Generation Diagnostic System (NGDS) Increment 1 program, managed by the Joint Program Executive Office for Chemical and Biological Defense (JPEO-CBD), which will be a Family of Systems (FoS) with the mission to identify and diagnose BWAs and other pathogens of operational concern to support individual patient treatment and force health protection decision making as well as CBRN situational awareness. The NGDS FoS will provide increments of CBRN diagnostic capabilities across echelons of care and provide common biological identification materiel solutions across the biological identification portfolio. The Increment 1 deployable component will be an FDA-cleared, reusable, portable biological pathogen diagnostic and identification system capable of rapidly analyzing clinical and environmental samples. Increment 1 technology will be adapted for environmental sample analysis applications through collaboration with the Common Analytical Laboratory System and Joint Biological Tactical Detection System program efforts. The NGDS program will establish a transition framework to facilitate the development and transition of diagnostic and environmental assays developed by DoD and interagency partners. NGDS Increment 1 will replace and improve upon the Joint Biological Agent Identification and Diagnostic System (JBAIDS), the current

³ Title 50 U.S. Code Section 1523, (b) 3: Measures taken to ensure the integration of requirements for chemical and biological defense equipment and material among the Armed Forces.

system capable of rapid and simultaneous identification of multiple biological agents and other pathogens of operational concern.

With respect to JBAIDS, JPEO-CBD continued to improve its capabilities in FY 2012 by filing six pre-positioned Emergency Use Authorization (EUA) diagnostic assay data packages with the FDA for new tests which, using the JBAIDS, will detect Ebola and Marburg viruses. The EUA is an authorization by the FDA for the use of an unapproved medical product or an unapproved use of an approved medical product during a declared emergency involving a heightened risk of attack on the public or U.S. military forces, or a significant potential to affect national security; a pre-EUA is a submission sent to FDA for review prior to the declaration of an emergency. JPEO-CBD also awarded a new contract to develop and integrate three real-time polymerase chain reaction assays onto the JBAIDS platform for the purpose of detecting pathogens in food and water. Another new contract was awarded to provide JBAIDS sustainment activities, including contractor logistic support, analyzer refurbishment, annual software security testing (required under the Federal Information Security Management Act), and laptop/operating system replacement.

Vital to successful diagnostics are the products of the Critical Reagents Program (CRP). A national resource for the biological defense community, the CRP serves as the principal resource of high-quality, validated, and standardized biological detection assays and reagents that meet the requirements of the Warfighter. The CRP's products include antibodies, inactivated antigens, genomic materials, assays, and biological sampling kits. In FY 2012, the CRP successfully completed two Foreign Military Sales cases while continuing to execute interagency agreements with stakeholders such as the U.S. Secret Service, U.S. Department of Health and Human Services (HHS), U.S. Capitol Police, and DHS.

Advances in Biosurveillance

Program/Effort Description

The *National Biosurveillance Strategy*, signed by the President in July 2012, defines biosurveillance as the process of gathering, integrating, interpreting, and communicating essential information related to all-hazards threats or disease activity affecting human, animal, or plant health to achieve early detection and warning, to contribute to overall situational awareness of the health aspects of an incident, and to enable better decision making at all Government levels. This updated definition is consistent with the definition of biosurveillance set forth in the 2009 Homeland Security Presidential Directive (HSPD)-21 and emphasizes an all-hazards scope and informed decision making. The *National Biosurveillance Strategy* flows from the *National Security Strategy*, which highlights the importance of disease surveillance for public health threats, and is aligned with the *National Strategy for Countering Biological Threats*, which emphasizes information sharing among federal departments and agencies to identify biological threats. The strategy directed the development of the *National Biosurveillance Implementation Plan*, which was released in February 2013. In order to codify and integrate DoD investments on biosurveillance and to provide an operational plan for implementing DoD efforts in support of the *National Biosurveillance Strategy*, the Office of the Assistant Secretary of Defense for Nuclear, Chemical, and Biological Health Programs (OASD(NCB)) and the Office of the Assistant Secretary of Defense for Health Affairs (OASD(HA)) developed a Memorandum of Understanding (MOU) describing how they will collaborate on cooperative activities that facilitate biosurveillance capability development. In FY 2012, the Biosurveillance Core Group was established in support of the MOU to improve understanding of biosurveillance challenges, integrate diverse biosurveillance-related technology development activities, ensure that solutions are developed with a focus on end-users, and align CBDP activities with National and DoD biosurveillance policy priorities. This group is comprised of program

managers and subject matter experts (SME) and is focused on integrating efforts in collaboration with colleagues in OASD(HA) and the Armed Forces Health Surveillance Center (AFHSC). There are currently four active subcommittees focused on program mapping, future capabilities, policies and exercises, and data use and policy.

CBDP objectives in biosurveillance are to provide CBR defense capabilities to support biosurveillance efforts and enable the Warfighter to achieve knowledge empowerment in the CBR domain. Key goals for DoD include optimizing rapid, accurate situational awareness of potential emerging CBR threats that could affect the health of the Warfighter or the ability to carry out missions in order to enable enhanced planning and response. A focus of FY 2012 activities included synchronizing nuclear, biological, and chemical (NBC) technology development efforts with the needs of operational elements in the Combatant Commands, the OASD(HA), and the AFHSC, which has the Departmental mandate for comprehensive health surveillance through DoD Directive (DoDD) 6490.02E, "Comprehensive Health Surveillance." Examples of FY 2012 accomplishments are detailed below.

Requirements Integration

In FY 2012, the JRO-CBRND led development and DoD Medical stakeholder coordination for the draft Biosurveillance Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, Facilities, and Policy (DOTMLPF-P) Change Recommendation, which focuses on documenting and implementing non-materiel solutions to improve the DoD's biosurveillance capabilities.

Science and Technology

Important steps have been made in developing systems for the enhanced situational awareness of threats to Service member health, which affect military planning. In FY 2012, JSTO-CBD selected three performers for the BSVE program, an innovative research effort that seeks to develop an interoperable environment that will dramatically accelerate DoD "detect-identify-respond" capabilities. The BSVE is a rapid, proof-of-concept effort that will leverage existing commercial and Government technologies to create an overarching system that will integrate and visualize the surveillance, detection, investigation, and response timeline for early warning and early confirmation. The BSVE will enable data integration from both open- and close-source networks that monitor any variable that could affect health (e.g., human, animal, and plant disease data; environmental disruptions; novel pathogen emergence; etc.). The BSVE will support a wide variety of data sources: open-source information; social media; PON/POC diagnostic data; and DoD, interagency, national, and international surveillance systems and data repositories. Data streams will be accessible between agencies, thus eliminating redundant efforts and streamlining disease surveillance effectiveness. The JSTO-CBD BSVE effort is separated into two functional areas: analytics and devices. The objective of analytics development for data collection is the aggregation of health surveillance data into a primary location. The integration of existing data and field diagnostic systems into a Web-based cloud network will promote clinical evaluation and validation of military and non-military threat agent outbreaks. This model may be further expanded for anomaly detection and emerging threats as well as endemic and epidemic disease data. Additionally, NGDS Increment 2 will provide diagnostic data by ensuring that PON diagnostics can wirelessly connect to biosurveillance systems. JPEO-CBD is also working with the JSTO-CBD BSVE initiative to identify potential technologies and tools that could be incorporated into the development of a Biosurveillance Portal (BSP) to facilitate situational awareness and analysis.

Research, Development, and Acquisition

In FY 2012, JPEO-CBD made technical advances in generating a BSP, which is a distributed system-of-systems information technology framework designed to facilitate user access to timely biosurveillance

data, information, and analytical products. The goal of the BSP is to provide users with a Web-based, unclassified framework of coupled systems which may be accessed to meet specific user/community-of-interest needs, fusing public health information from sensors, reports, and open sources. It provides a collaborative workspace with tiered communication and workflow functions. In FY 2012, DoD stakeholders, including U.S. Forces Korea (USFK) and AFHSC, were engaged for their user feedback to obtain their needs and determine the most appropriate analytic public health products for integration into the BSP.

The JPEO-CBD continued in FY 2012 to develop technologies to enable early warning, identification, and situational awareness of potential global health threats. JPEO-CBD's biosurveillance portfolio includes the three programs previously described in this report: NGDS, JBAIDS, and CRP. Such diagnostic capabilities would feed into the BSP being developed jointly by JPEO-CBD and JSTO-CBD with USFK to provide an unclassified interface that analyzes and integrates environmental and medical information from sensors, reports, and open sources.

Advances in Medical Countermeasures

Program/Effort Description

This is the life cycle management of FDA-approved medical systems for protection and treatment against CBR threat agents. Overarching CDBP objectives for MCM development are to establish a robust MCM pipeline from requirements definition, through RDT&E and FDA approval, to manufacturing and distribution. This pipeline will focus on mitigating current CBR threats using platform technologies capable of expediting responses to validated, known, and emerging threats. Examples of FY 2012 accomplishments are detailed below.

Requirements Integration

In coordination with the JRO-CBRND, OASD(HA) led the production of two separate Analysis of Alternatives studies (one for the Western, Eastern, and Venezuelan Equine Encephalitis Vaccine advanced development effort and one for the Centrally Acting Nerve Agent Treatment System effort). These two analyses support Defense Acquisition System development efforts to acquire medical products for use as MCMs against CB agents. OASD(HA) also conducted an independent validation of JPEO-CBD market research of existing candidate technologies for use as MCMs against Ricin intoxication.

Science and Technology

MCMs against Biological Agents

The JSTO-CBD vaccine program completed the transition of two candidate vaccines that are effective against Filoviruses (i.e., Ebola Zaire, Ebola Sudan, and Marburg) to JPEO-CBD for advanced development. In FY 2012, JSTO-CBD continued to conduct the necessary remaining S&T studies that are required for JPEO-CBD to submit an Investigational New Drug (IND) application to the FDA for advancement of these vaccine candidates for clinical testing. In addition, studies were completed to file an IND for the advancement of DNA-based Alphavirus (i.e., Western, Eastern, and Venezuelan Equine Encephalitis Virus) vaccines, which are scheduled to transition to JPEO-CBD in FY 2014. Lastly, a Phase I clinical trial was conducted for a vaccine effective against Ricin toxin, which will transition to advanced development in FY 2013.

JSTO-CBD made significant progress towards developing the necessary assays and tools to facilitate development of vaccines and therapeutics that meet FDA regulatory standards required to carry out the

mission of the DoD-wide Medical Countermeasures Initiative (MCMI). JSTO-CBD continued the development of relevant animal models for *Burkholderia*, Filoviruses, and Alphaviruses. Animal models are required for the testing, evaluation, and licensure of both vaccines and therapeutics generated against these pathogens. In addition to animal models, JSTO-CBD continued the development of simulated human organs in which both vaccine and drug toxicities and activity/efficacy can be assessed prior to entering human clinical trials, increasing the predictability of human toxicity and efficacy for better candidate selection in biodefense research.⁴

JSTO-CBD, as part of the Core Antibiotics Testing Program, screened more than 30 additional FDA-approved and marketed drugs for activity against known biodefense threats. In addition, JSTO-CBD conducted the necessary animal studies to demonstrate a novel anti-bacterial drug candidate effective against Plague and Anthrax. JSTO-CBD has completed the necessary animal studies to support the repurposing of FDA-approved antibacterial drug for an indication against plague. JSTO-CBD, working closely with industry, filed IND applications for two novel bacterial inhibitors with potential to treat selected biothreat pathogens.

In the area of developing candidate anti-virals, JSTO-CBD has recently awarded a contract to develop a cocktail of three monoclonal antibodies. In both rodent and primate studies, the antibody cocktail demonstrated post-exposure efficacy against Ebola infection. An additional JSTO-CBD project has been initiated to develop a broad-spectrum monoclonal antibody therapeutic with anti-Filovirus activity.

MCMs against Chemical Agents

Several advances were made in the development of MCMs against chemical threat agents. These successes used *in vitro* tests as well as animals as ethical surrogates to model human exposure to deadly chemical agents. The portfolio for MCMs focuses on therapies given either before or immediately after nerve agent exposure.

Leading these efforts was the successful use of scopolamine (an FDA-approved treatment for seasickness) with current medical treatments to increase survival in an animal model after exposure to nerve agents. These positive results with an established, well-characterized drug are important because they could shorten the time needed for FDA approval for use as a nerve agent treatment.

In FY 2012, several new therapeutic candidates that can reverse the toxic effects of nerve agents on the brain were developed and tested. These “centrally active” compounds are promising leads for treatments that will protect Warfighters from immediate and long-term effects of nerve agent exposure. Additionally, the manufacturer of the active component of the drug used in the Advanced Anticonvulsant System, developed to treat nerve agent exposure, achieved FDA Orphan Drug Designation. Designation was sought to both save an estimated \$2.3M and more rapidly achieve FDA approval consistent with current law.

Efforts to develop an effective catalytic bioscavenger to detoxify nerve agents have identified a capable candidate able to protect against multiple types of nerve agents (G agents, such as Soman, and V agents, such as VX) in animals.

⁴ Title 50 U.S. Code Section 1523, (b) 9: A description of any program involving the testing of biological or chemical agents on human subjects that was carried out by the Department of Defense during the period covered by the report.

Research, Development, and Acquisition

On October 26, 2011, the JPEO-CBD chartered the Joint Project Manager (JPM)-MCM Advanced Development and Manufacturing (ADM). The MCM ADM program was initiated in response to a White House memorandum directing the DoD to “[e]stablish agile and flexible advanced development and manufacturing capabilities to support the development, licensure, and production of MCMs that address the needs of our military forces and the Nation.” During FY 2012, JPEO-CBD initiated studies regarding risk reduction in the transitioning of MCM products to utilize the specific production and manufacturing processes of the ADM Capability. Further, JPEO-CBD met with the HHS Biomedical Advanced Research Development Authority to establish a framework for collaboration between each department's MCM ADM efforts, with the objective to provide unique but complementary ADM capabilities that meet national security goals. Contract award was announced by DoD on March 21, 2013.

In FY 2012, JPEO-CBD’s Recombinant Plague Vaccine program successfully re-engineered and validated its large-scale manufacturing processes to increase the production yield to better meet Warfighter requirements. This large-scale validation is a critical step towards full rate production (FRP) and FDA licensure.

In FY 2012, JPEO-CBD’s Filovirus Vaccine program awarded a contract for process development and production of current Good Manufacturing Practices materiel for the Virus Replicon Particle (VRP) candidate, one of the DoD Filovirus vaccine prototypes. This materiel will be used for a future Phase I Clinical Trial. Successful completion of a Phase I Trial will allow for consideration of the VRP candidate at Milestone (MS) B, which begins the Engineering and Manufacturing Development (EMD) phase of the Defense Acquisition process.

In FY 2012, JPEO-CBD’s Bioscavenger program re-released its EMD Request for Proposal (RFP), and contract award is anticipated by summer 2013. Bioscavenger will be the first prophylactic to protect Warfighters and first responders from incapacitation and death caused by all known organophosphorus nerve agents (e.g., Soman, Sarin, and VX) and NTAs. DHS and the Environmental Protection Agency have both indicated interest in this capability.

In FY 2012, JPEO-CBD’s EID-Flu MCM acquisition program awarded a \$138.5M contract for the advanced development of a novel viral MCM, a broad-spectrum therapeutic against multiple Influenza viruses, including the 2009 H1N1 pandemic virus and drug-resistant Influenza strains. This effort will help bolster the protection of the Joint Force against naturally occurring pandemic Influenza and/or biologically engineered flu viruses.

In FY 2012, a Marburg drug candidate within JPEO-CBD’s Hemorrhagic Fever Virus (HFV)-Therapeutics MCM Acquisition program showed survival rates up to four days post-infection for non-human primates, twice the objective desired by the Services. The placebo-treated control group had a zero percent survival rate. The objective of the Marburg drug candidate is to extend the Warfighter’s window of opportunity for effective medical intervention. Currently, no known therapeutics exist to treat infections caused by highly lethal HFVs. JPEO-CBD is targeting Marburg as a model for testing the development of rapidly adaptable, platform-based, post-exposure therapeutics for all HFVs.

DoD/HHS Collaborations on MCMs

The DoD participates as a key interagency partner in the HHS-led Public Health Emergency Medical Countermeasures Enterprise (PHEMCE), which coordinates MCM-related efforts within the interagency.

Through ongoing oversight activities of the PHEMCE, DoD participates in the coordination of early stage research, ADM, procurement, inventory management, and stockpiling as well as response planning, policy, guidance, and communication.

Advances in Non-Traditional Agent Defense

Program/Effort Description

NTAs are chemicals reportedly researched or developed with potential application or intent for use as CWAs, but which do not fall in the category of traditional CWAs or Toxic Industrial Chemicals (TIC)/Toxic Industrial Materials. Developing defenses against NTAs are a priority in both DoD and national strategies. The CBDP goals are to further scientific understanding of NTAs and to integrate NTA defense capabilities into future CB defense systems, as required. Examples of FY 2012 accomplishments are detailed below.

Science and Technology

JSTO-CBD determined prioritized NTA agent characteristics as well as estimates of human exposure limits (from skin exposure). This physical and toxicological information enables more realistic countermeasure development, improves accuracy of decision support tools, and informs more realistic Concepts of Operations (CONOPS) and Tactics, Techniques, and Procedures. An assessment of current decontaminant formulations proved that currently available options are effective against some NTAs. Ongoing research also supports potential improvements to existing MCMs for NTAs through the addition of an adjunct therapy to the current standard of care.

Research, Development, and Acquisition

In FY 2012, the JPEO-CBD continued its NTA Defense Test System (NTADTS) effort. NTADTS will provide a new test capability to the U.S. Army Edgewood Chemical Biological Center (ECBC) at Aberdeen Proving Ground, featuring a new, large-scale NTA and traditional CWA test capability for CBDP commodity items. The completed facility will offer advanced referee instrumentation, the ability to control environmental conditions over a broad range of temperatures and relative humidities, and state-of-the-art dissemination systems that are capable of dispensing a wide array of challenge materials, to include vapors, aerosols, and interferents. The objective of the NTADTS is to support T&E of contamination avoidance, collective and individual protection, decontamination, and information systems (hardware components) commodity areas. The facility is expected to be operational by 2015.

Enterprise Advancements in CBDP Science and Technology

JSTO-CBD develops scientific knowledge and technological solutions to reduce the CBR threat to U.S. Forces, our allies, and our homeland and is responsible for maintaining robust Service Lab S&T capabilities that are not available anywhere else. The office transitions technological options to the JPEO-CBD for advanced development.

Basic Research

This year, the basic research portfolio demonstrated silicon nanowire's potential to improve biosensor capability by providing ultrasensitive detection at concentrations well below current capabilities. Another effort developed a model to understand how a virus changes when it is transmitted serially, from one animal to the next, which assists in understanding potential emergence of new diseases. JSTO-CBD basic research also developed a prediction algorithm that derives the shape of a droplet (such as

liquid chemical agent) at the interface between a fiber and a planar surface (e.g., a uniform fiber and a desk) to guide the development of fabrics and materials that resist contamination.

Detection

JSTO-CBD transitioned studies to the CRP to increase understanding of critical biological antigen variability, transitioned the maturation of technology for biological detection, completed data collection and safety protocol development on the priority NTA compounds, and continued development of automated sample preparation technology to sequence pathogen genomes. Additionally, the program continued development of the micro gas analyzer (Comprehensive Two-dimensional Gas Chromatography-Mass Spectrometry) to support Next Generation Chemical Detection.

Individual Protection

In the area of individual protection, JSTO-CBD developed three separate treatments that allow fabrics to repel or shed chemical agents to reduce penetration and increase the useful life of protective garments. These treatments are now available as a commercial off-the-shelf (COTS) solution. The individual protection program has also developed a dual cavity respirator prototype that is ready for field testing, which is capable of providing Powered Air Purifying Respirator levels of protection with significantly reduced power requirements. In addition, the S&T effort is investigating new approaches using dynamic multifunctional materials for CB protection that will increase protection while lowering the thermal burden on the Warfighter.

Collective Protection

In the area of ColPro, JSTO-CBD developed and transitioned a TIC filter to the Army Corps of Engineers that they will use to protect critical overseas facilities. System design and self-decontaminating surfaces were also developed and validated for the bio-protection of facilities.

Hazard Mitigation

In the area of hazard mitigation, JSTO-CBD developed and transitioned contamination indicator sprays that disclose the location of nerve agents (V and G series), blister agents (HD), and emerging threats (e.g., NTAs) that will enhance the effectiveness of decontamination operations by revealing areas that are contaminated. The decontamination program developed and transitioned a solid oxidizer decontaminant technology that provides an effective, non-corrosive alternative to currently fielded technologies. It provides significant logistical advantages for shipment and storage over other non-corrosive alternatives. Additionally, hazard mitigation continues to focus on the development of chemical agent shedding and resistant coating to reduce the amount of contamination left on equipment following a contamination event. Hazard mitigation research is underway that explores using environmentally friendly bactericides to develop a new way to mitigate the effects of a wide area dissemination of Anthrax spores, which has the potential to rapidly return ports and airfields to service following an attack.

Test Methods

During FY 2012, physical countermeasures S&T efforts developed more than 20 new test methods that were transitioned to the test community, which enhance and speed the development and fielding of emerging technologies. Physical countermeasures also conducted Advanced Technological Demonstrations (ATD) to demonstrate the use of developing technologies in a field setting and help develop new concepts of operations. JSTO-CBD transitioned Enhanced Chemical Test Methods to the test community, delivering a reusable test material fixture that reproducibly holds test materials in both vertical and horizontal orientations, supporting the Decontamination FoS. S&T also transitioned test

methods for ColPro to the test community to enhance test capabilities in the area of air purification, novel closures, and simulant test platforms. The S&T effort also transitioned TIC/Battlefield contaminants test standards for individual protective equipment (IPE) and ColPro to the testing community. In cooperation with the United Kingdom defense establishment, JSTO-CBD also completed integration and testing of anti-fog and real-time fit for masks.

Modeling & Simulation

JSTO-CBD accelerated development and deployed the Waterborne Fate & Transport models to DTRA's Operational Reachback Group following the Fukushima nuclear incident, which was subsequently leveraged by the U.S. Navy. This capability, produced in just 14 days, incorporated Japan-specific reactor sources, coastline, and oceanographic data (provided by the Naval Oceanographic Office) to assist in radiological waterborne transport and dispersion modeling in support of Operation TOMODACHI in Japan.

JSTO-CBD is developing the Chemical and Biological Effects Manual to provide visibility for the CBRN community of interest into standardized CB defense modeling and analytical practices, relevant datasets, models, and analytical tools via a single, comprehensive, CBDP-approved source. This includes the aggregation of data and documentation in a unique way, to include structured and unstructured holdings to aid in CB defense analysis, metadata for external holdings, and tutorial-level instructions.

Analysis Support

The Analysis Support Program (ASP) was created to provide reachback for decision support and acquisition analysis to the CBDP. Recently, the ASP completed a significant study examining how past and current CBRN force planning constructs have been used to support CBDP planning processes, with identified recommendations and potential methodologies to improve the development and use of the CBRN force planning constructs within the CBDP. In addition, the ASP reconstituted and verified Chemical Biological Operational Support System data, an extensive (approx. 600 tables) degradation database for Army/ground forces for satisfying Operational Effects requirements/concepts, and has saved the program the significant cost of recreating this valuable, relevant, analytic data.

Techbase Technology Transition

The Hazard Mitigation Materiel and Equipment Restoration Advanced Technological Demonstration (ATD) validated military utility of mobile and stationary suites for operational decontamination, to include decontamination indicator sprays and strippable coatings. JSTO-CBD continued its partnership with Poland on the Trans-Atlantic Collaborative Biological Resiliency Demonstration to continue collaboration in developing a capability to respond to a wide-area biological incident. The Rapid Area Sensitive Reconnaissance ATD continued to demonstrate a capability to survey sensitive sites rapidly to determine the presence of NTAs, TICs, or CWAs through extensive user evaluations. Physical countermeasures also conducted ATDs to demonstrate the use of developing technologies in a field setting and help develop new concepts of operations.

Enterprise Advancements in Materiel Development

Within the DoD acquisition system, the JPEO-CBD is the designated Milestone Decision Authority for all CB defense acquisition programs. Within JPEO-CBD, seven JPMs lead, manage, and direct the acquisition and fielding of CB defense systems. Above all, JPEO-CBD advances CBRN defense technologies from development to the Warfighter in the field as defensive capabilities. In addition to those previously referenced, FY 2012 accomplishments for the JPEO-CBD are detailed below.

Detection

JPEO-CBD completed fabrication and installation of the Whole System Live Agent Test (WSLAT) chamber at Dugway Proving Ground (DPG), Utah. The WSLAT chamber will provide significant biological T&E capability for existing and future biological detection programs.

JPEO-CBD fielded 11 Dismounted Reconnaissance Kits to a U.S. Army Chemical Corps unit in Kuwait to meet a U.S. Army Central (ARCENT) Operational Needs Statement. The 11 kits provide improved dismounted CBRN reconnaissance capability for the ARCENT Area of Responsibility (AOR) to counter emerging weapons of mass destruction (WMD) threats.

JPEO-CBD's Stryker NBC Reconnaissance Vehicle (NBCRV) program finished production of 95 sensor suites for the extended low rate initial production phase of the Stryker NBCRV acquisition effort and began production of 158 sensor suites for FRP. The U.S. Army Chemical Corps has reported that the Service reconnaissance capability is receiving a substantial enhancement with the continued fielding of the Stryker NBCRV.

JPEO-CBD's Contractor Logistics Support (CLS) program provided on-site support for complex, low-density CB defense systems while addressing operational, technical, and obsolescence issues to ensure mission and force protection capabilities at more than 97% operational availability. This effort supports Soldiers, Sailors, Airmen, and Marines worldwide. The CLS program achieved a direct contract cost reduction of \$43M (16 percent) despite a 42 percent increase in systems supported.

JPEO-CBD successfully evaluated 19 chemical sensors of various technologies against a full spectrum of chemical compounds in different phases of matter to support the Next Generation Chemical Detector (NGCD) program. Furthermore, the project increased the industrial knowledge base to better enable industry to support the NGCD.

JPEO-CBD achieved a successful FRP decision to replace the Navy's legacy CWA detection system (installed across the entire Naval fleet) with the Improved Point Detection System-Lifecycle Replacement, which provides improved reliability and reduced sustainment costs over its predecessor.

In FY 2012, the JPEO-CBD biological point detection team fielded 56 M31A2 Biological Integrated Detection System in FY 2012. The team also fielded 13 M98 Joint Biological Point Detection Systems, 12 of which were installed aboard U.S. Navy ships.

Protection

JPEO-CBD's Uniform Integrated Protection Ensemble (UIPE) Increment 1 program was approved to enter into the EMD phase of the Defense Acquisition System and awarded contracts to three vendors. The UIPE will provide individual protection capabilities with reduced weight, bulk, and thermal strain.

JPEO-CBD's Joint Service General Purpose Mask (JSGPM) reached more than 500,000 successful fieldings in FY 2012. U.S. Air Force (USAF) modernization for ground crew CBR respiratory and ocular protection is now complete, while JSGPM production and fielding will continue for the U.S. Army and U.S. Navy. In January 2012, Army Contracting Command-Aberdeen Proving Ground awarded a contract for a second manufacturer for the M61 filter used in the JSGPM. This award injects competition and protects the supply source to support fielding and sustainment.

JPEO-CBD's Joint Expeditionary Collective Protection (JECF) program conducted a successful operational assessment in August 2012, which provided user feedback to support the MS C decision occurring in February 2013. MS C authorizes entry into the Production and Deployment phase of the Defense Acquisition System. JECF will provide the Joint expeditionary forces a ColPro capability which is lightweight, compact, modular, and affordable. The JECF FoS includes tent kits, structure kits, and standalone shelters that allow the application of ColPro to transportable soft-side shelters, enclosed spaces of opportunity, and remote austere locations as a standalone resource.

JPEO-CBD's Joint Service Aircrew Mask program completed production of its Apache Variant (MPU-6), representing a Total Service Requirement of 2,381 systems. The MPU-6 provides head, eye, respiratory, and CB protection for Army AH-64 helicopter aircrew.

Hazard Mitigation

JPEO-CBD's Contaminated Human Remains Pouch (CHRP) program achieved approval of its Capability Development Document (CDD) on July 2, 2012, validating the Key Performance Parameters contained in the CDD. The CHRP will be employed on the battlefield as a means to protect Warfighters from hazards posed by CBR-contaminated human remains during their recovery from the point of fatality, during transport to the Mortuary Affairs Contaminated Remains Mitigation Site, and during temporary storage or interment. CDD approval in the fourth quarter of FY 2012 enabled the program to move forward as scheduled.

JPEO-CBD released RFPs for the Joint Service Equipment Wipe (JSEW) and General Purpose Decontaminant(s) (GPD), and SSEB reviews of industry proposals were completed. Eleven contracts were awarded to successful vendors for test samples to determine their products' ability to meet performance requirements. JSEW will provide immediate (operational) decontamination capabilities for sensitive and non-sensitive equipment in hostile and non-hostile environments that have been exposed to chemical contamination. GPD will provide thorough decontamination capabilities for tactical vehicles, shipboard surfaces, crew-served weapons, and individual weapons in hostile and non-hostile environments that have been exposed to CB contamination.

Homeland and Installation Defense for CBRN Response

JPEO-CBD rapidly fielded more than \$47M in CBRN protection, search and rescue, and mass decontamination capability equipment for the Defense CBRN Response Force (DCRF) and Command and Control CBRN Response Elements (C2CRE), which carry out life-saving, enabling tasks as part of the DoD CBRN Response Enterprise's support of civil authorities.

JPEO-CBD collaborated with the Office of the Assistant Secretary of Defense for Homeland Defense and Americas' Security Affairs and U.S. Customs and Border Protection (CBP) to transfer retrograded DoD capabilities (excess equipment) to the CBP for the purpose of improved homeland security. The intent of this initiative is to lower overall equipment procurement costs for the Government while facilitating reuse of excess capabilities across a broader spectrum of U.S. Governmental agencies.

Information Systems

The JPEO-CBD's Joint Warning and Reporting Network (JWARN) Increment 1 was fielded to the U.S. Marine Corps (USMC) in conjunction with the Joint Tactical Common Operating Picture (COP) Workstation. JWARN is a computer-based application that incorporates sensor alert information and CBRN observation reports from the field, generates a plot of the hazard area, displays it on the COP, and generates a warning message to units.

JPEO-CBD's Joint Effects Model (JEM) Increment 1 completed deployment to the USAF, U.S. Army, and USMC. In addition, a successful Multi-Service Operational Test and Evaluation with the U.S. Navy was conducted. JEM is a Web-based software application that provides DoD with an accredited tool to effectively model and simulate the effects of CBRN weapon strikes and incidents.

Fielded Quantities and Capabilities

The 1,572,465 systems, products, and vaccine doses provided by the JPEO-CBD to provide capability during FY 2012 are listed in Enclosure A.⁵

Industrial Base

The JPEO-CBD Joint Logistics Advisory Council for CB Defense Industrial Base Working Group (IBWG) FY 2012 core assessment areas included CDBP items, the Organic Industrial Base (OIB), and Critical CBRN Manufacturers. The assessments revealed that the overall health of the CBRN Industrial Base (IB) is very capable, with risks identified in the ability to maintain the future capabilities of the OIB.⁶ The advantage of the CBRN IB is the broader market sector supported, which includes not only DoD but also first responders, health care professionals, and other Government agencies. Although the CBRN IB will continue to face challenged economies, globalization of manufacturing, and probable shifts in national defense priorities, the IBWG provides the architecture to identify and mitigate risks proactively through recommendations influencing acquisition and industrial preparedness measures.⁷

Testing and Evaluation

In FY 2012, CBRN defense T&E standards development continued expansion efforts, publishing eight standards documents, with eleven currently in staffing. This effort continues to support the White House initiative to develop CBRN defense standards across Government agencies. The DoD CBRN Defense T&E Executive is integrating this process with federal agency, industry, and international partners to establish the required rigor and documentation of test methodologies. The CBRN Defense T&E Executive is continuing efforts with interagency partners to develop standardized COTS test programs that will use T&E standards, accredited labs, and independent data analysis. These T&E standards development efforts lead to reliable, quality data that can be accessed and shared by all for best value "fit for purpose" procurement. Additionally, the National Institute of Standards and Technology (NIST) and DHS have agreed to provide concurrence on DoD CDBP T&E Test Operating Procedures, and NIST is publishing them on their website, providing easy access to interagency, international, business, and academic partners.

⁵ Title 50 U.S. Code Section 1523, (b) 1: The quantities, characteristics, and capabilities of fielded chemical and biological defense equipment to meet wartime and peacetime requirements for support of the Armed Forces, including individual protective items.

⁶ Title 50 U.S. Code Section 1523, (b) 6: Problems encountered in the chemical and biological warfare defense program during the past year and recommended solutions to those problems for which additional resources or actions by the Congress are required.

⁷ Title 50 U.S. Code Section 1523, (b) 2: The status of research and development programs, and acquisition programs, for required improvements in chemical and biological defense equipment and medical treatment, including an assessment of the ability of the Department of Defense and the industrial base to meet those requirements.

Investments continue to be made in unique CB defense T&E capabilities. Work continues on BWA simulants upgrades to the test grid, scheduled to complete in FY 2014, and the WSLAT for biological point detection systems will have an initial capability in FY 2013, with full capability expected in FY 2014. Initial WSLAT verification and validation (V&V) was scheduled in FY 2012 but has been delayed into FY 2013. Additionally, development and V&V efforts for several key test capabilities for NTAs, next-generation CWA materials tests, and T&E models are ongoing, with expected incremental completions in FY 2013-2015.

The CBRN Defense T&E Executive continues to better integrate CBRN intelligence feeds to the CBEP Enterprise. This integration is critical for producing System Threat Assessment Reports and Joint Threat Test Support Packages that support operationally realistic threat presentations during operational test events.

Policy, Training, and Education

The Doctrine, Training, Leadership, and Education strategic goal is to continue developing and integrating Joint CBRN defense capabilities that enable the Department to operate readily with interagency and international partners in support of the national military strategies. Enclosure C lists the Combating Weapons of Mass Destruction (CWMD), CBRN Responder, and medical personnel training and education courses in compliance with section 1523.⁸

Policy

In order to codify and integrate DoD investment on biosurveillance, the OASD(NCB) and OASD(HA) developed the previously noted MOU describing how they will collaborate on cooperative activities that help counter WMDs. In February 2012, OASD(HA) published the updated DoDD 6490.02E, which provides DoD policy for force health protection both in garrison and during deployment. In addition, OASD(HA) coordinated the DoD effort of preparing the *National Strategy for Biosurveillance Implementation Plan* for issuance in early 2013. The *National Biosurveillance Implementation Plan* is aligned with the *National Strategy for Countering Biological Threats*, which emphasizes information sharing among federal departments and agencies to identify biological threats.

In June 2012, DoD CB agents security policy Principal Staff Assistant responsibility was realigned from Under Secretary of Defense for Intelligence to Under Secretary of Defense for Acquisition, Technology, and Logistics. Realigning these security functions and responsibilities will allow DoD to better balance and more effectively coordinate and integrate CB activities and requirements within the Department and with other federal agencies and non-federal partners.

DoD Instruction 3020.52, "DoD Installation Chemical, Biological, Radiological, Nuclear, and High-Yield Explosive (CBRNE) Preparedness Standards," establishes and implements policy and prescribes standards and procedures to achieve installation preparedness for CBRNE incidents consistent with the authorities in sections 2311-2317 of title 50, U.S. Code. This instruction aligns DoD CBRNE preparedness activities for prevention, protection, mitigation, response, and recovery with the National Incident Management System (NIMS); the National Preparedness Guidelines; and associated HSPDs for

⁸ Title 50 U.S. Code Section 1523, (b) 4: The status of nuclear, biological, and chemical (NBC) warfare defense training and readiness among the Armed Forces and measures being taken to include realistic nuclear, biological, and chemical warfare simulations in war games, battle simulations, and training exercises.

Management of Domestic Incidents; Critical Infrastructure Identification, Prioritization, and Protection; National Preparedness; Biodefense for the 21st Century; and Public Health and Medical Preparedness. This instruction also integrates and synchronizes DoD CBRNE preparedness activities with DoD installation emergency management programs while providing CBRNE-specific guidance and standards for DoD installations worldwide to use when preventing, protecting against, mitigating, responding to, and recovering from CBRNE incidents.

OASD(HA) obtained Deputy Secretary of Defense approval of policy guidance expanding the Smallpox and Anthrax vaccine programs to include Reserve Component forces (including National Guard (NG) forces) of the CBRN Response Enterprise, addressing a request by U.S. Northern Command (USNORTHCOM) to standardize the immunization requirements of these forces.

In FY 2012, the JRO-CBRND, in accordance with (IAW) CJCS Memorandum 5120.01, "Joint Doctrine Development Process," has equities and provided input into more than 20 Joint Publications (JP). JRO-CBRND is the Joint Staff Doctrine Sponsor for JP 3-11, *Operations in Chemical, Biological, Radiological and Nuclear Environments*, and is responsible for implementing the revision cycle. JRO-CBRND also sponsored and provided oversight in the development of numerous Multi-Service Tactics, Techniques, and Procedures (MTTP) during 2012, including *MTTP for Treatment of Nuclear and Radiological Casualties*, *MTTP for CBRN Reconnaissance and Surveillance*, *MTTP for Treatment of Chemical Agent Casualties and Conventional Military Injuries*, *MTTP for Treatment of Biological Warfare Injuries*, and *MTTP for Potential Military Chemical/Biological Agents and Compounds*.

In FY 2012, the Joint Staff J5, in conjunction with U.S. Strategic Command (USSTRATCOM), revised and published an updated edition of JP 3-41 *Chemical, Biological, Radiological and Nuclear Consequence Management*. USSTRATCOM also established the Standing Joint Force Headquarters for Elimination to provide planning, intelligence, and operational capability for combating and eliminating WMD. The Joint Staff J5 published CJCS Instruction 5113.03, "Counterproliferation Interdiction Policy," to set policy and provide operational guidance for the planning and execution of U.S. military support for Counterproliferation Interdiction operations. As the global synchronizer for CWMD, USSTRATCOM released the revised Global Campaign Plan for Combating WMD to synchronize planning for DoD CWMD efforts in coordination with other Combatant Commands, the Services, and as directed, appropriate U.S. Government agencies. These actions continue to provide policy guidance, planning direction, and doctrinal foundations which enable the delivery of relevant capabilities to support Warfighter efforts to counter WMD.

Training and Education

OCONUS

The CBDP provides leadership and oversight within the CBRN Enterprise and USFK for the planning and execution of ABLE RESPONSE, an annual combined Republic of Korea (ROK)-U.S. Joint and interagency exercise that applies a Whole of Government approach to strengthen the ROK-U.S. capability to prepare for and respond to a naturally occurring or intentional biological incident on the Korean peninsula. ABLE RESPONSE 2012 was held at the Korean Institute for Defense Analyses in Seoul, Korea, with 45 senior leaders and more than 200 participants from ROK, U.S., and Australian Governments.

Pursuant to the goals of the ABLE RESPONSE 2012 table top biodefense exercise, the U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID) was asked to provide the Medical Management of Chemical and Biological Casualties (MCBC) Basic and Instructor and the Field Identification of Biological

Warfare Agents-Managers Course (FIBWA-MC) courses to as many U.S. and ROK military and government healthcare providers and laboratory services members as possible during a three-week timeframe. Fifteen medical and laboratory SMEs from USAMRIID and the U.S. Army Medical Research Institute of Chemical Defense (USAMRICD) conducted the MCBC Basic and Instructor courses and the FIBWA-MC at the Armed Forces Medical Command, Bundang, and the 121st Combat Support Hospital/Brian Allgood Army Community Hospital, Yongsan, from Oct. 8-25, 2012. Four iterations of the MCBC Basic and two iterations of the MCBC Instructor courses (a mix of didactic instruction and small group case scenarios) resulted in 85 ROK and 38 USFK personnel successfully trained, increasing awareness and clinical expertise in detecting, diagnosing, and managing casualties of CB agents. Three iterations of the FIBWA-MC course (a mix of didactic instruction and laboratory exercises) resulted in 16 ROK and 12 USFK personnel successfully trained, increasing awareness and confidence level to detect and diagnose incidents attributed to natural or introduced biological agents.

Also in FY 2012, U.S. European Command (USEUCOM) integrated realistic CBRN defense into several training and exercise events. These included multiple echelons in both simulation and hands-on training. USEUCOM increased its preparedness through military-to-military and military-to-civilian engagements, Joint training events such as the 2012 North Atlantic Treaty Organization (NATO) CM exercise involving 30 nations held in the Republic of Georgia, and interagency interaction to bolster collective capabilities in CBRN defense.

Continental United States (CONUS)

U.S. Army CBRN School (USACBRNS)

The Maneuver Support Center of Excellence, located at Fort Leonard Wood (FLW), MO, serves as the center for co-located Service CBRN specialist training including the Army, USMC, Navy, and USAF. In 2012, USACBRNS initiatives included:

- Development and execution of the first multi-Service Basic Warrant Officer Course with the U.S. Army and USMC
- Development and execution of the Joint Senior Staff Planners Course
- Initial planning of the Joint CBRN Training and Education Complex
- Continued investigation of various multi-Service opportunities to train Joint Forces in support of Countering WMD (CWMD) activities.

The USACBRNS has transitioned CBRN training and education from traditional lecture-based instruction to techniques and methods that engage students and incorporate the complexities of the global threat. The use of key expertise from ECBC, DPG, and Defense Threat Reduction University has significantly improved the scope and depth of CBRN instruction at FLW. This training and education evolution has enhanced the development of technical experts and leaders responsive to technical innovation and evolving threats. The USACBRNS CBRN specialists' training consists of courses designed to support instruction in CBR agents, hazardous material (HAZMAT) characteristics, decontamination operations, individual protective clothing and equipment, and elements of CWMD, to include CBRN CM and elimination as well as live/toxic agent training in the Chemical Defense Training Facility (CDTF). Toxic agent training is mandatory for all CBRN specialist initial entry and professional courses. The CDTF trained more than 5,000 U.S. Service members and international students during FY 2012.

The USACBRNS continues its cooperation with the Air Force Civil Engineer Center to certify students at the HAZMAT Awareness, Operations, Technician, and Incident Commander levels and is actively

engaged in implementing the latest National Fire Protection Association 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*, throughout all professional education courseware.

The USACBRNS and its partners are engaged in efforts to shape and refine the CBRN Response Enterprise Concept. In addition to CBRN personnel from both the reserve and active force, the USACBRNS provides institutional training to forces such as the NG WMD Civil Support Teams (WMD-CST); CBRNE Enhanced Response Force Packages (CERFP) and Homeland Response Forces (HRF); DoD CBRN Response forces; and the U.S. Coast Guard's National Response Teams. These and other CBRN courses that support CWMD continue to draw interest from all the Services and many civilian agencies responsible for CBRNE response-related activities.

United States Army Medical Research and Materiel Command (USAMRMC)

In FY 2012, USAMRMC trained more than 1,100 students in an accredited course in MCBC at USAMRICD and USAMRIID.

OASD(HA)

In FY 2012, the Armed Forces Radiobiology Research Institute (AFRRI), Military Medical Operations (MMO), provided 23 Medical Effects of Ionizing Radiation Courses in FY 2012 to 669 students. MMO staff travel CONUS and OCONUS to provide training to military personnel. This course is designed to provide the basic and advanced fundamentals for ionizing radiation, improve the operational capabilities of the Military Services, provide medical and operational personnel with information on biomedical consequences of radiation exposure, and provide information on managing radiological casualties.

In FY 2012, the Defense Medical Readiness Training Institute (DMRTI) provided basic CBRNE training to the tri-service medical personnel corps (i.e., medical, dental, medics, etc.). This training was provided through six Emergency Preparedness and Response Courses (EPRC), both in-residence and online. For FY 2012, a total of 82,450 students completed DMRTI EPRC courses. The six courses consisted of the following: 1) Clinician Long Course: Prepares military clinicians to effectively manage casualties during an all-hazards event; 2) Clinicians Short Course: A refresher/sustainment course; 3) Operator Long Course: Designed for personnel providing security support and non-direct patient care; 4) Operator Short Course: A refresher/sustainment course; 5) Basic Awareness Course: Provides an overview of CBRNE; and 6) Executive Commander Course: Provides an overview of the National Response Framework.

JRO-CBRND

In 2012, the JRO-CBRND conducted 85 CWMD/CBRN educational courses for more than 4,200 students, highlighted by the presentation of two Joint Senior Leaders' Courses, which were provided for more than 100 senior Joint Service leaders. This multi-Service and multi-organizational training in CBRN leadership is conducted at the FLW CBRN Center and School.

CBDP and NDU Center for the Study of Weapons of Mass Destruction (CSWMD)

In 2012, the Deputy Assistant Secretary of Defense for Chemical and Biological Defense and the Director, CSWMD inaugurated the CBDP Graduate Fellowship Program in CWMD, leading to a master's degree in CWMD Studies. The program is designed to meet the advanced education needs of DoD CWMD practitioners and to foster a community of DoD leaders with deepened CWMD expertise. It consists of a hybrid graduate educational experience that includes a mainstream master-level graduate education, specialized (including classified) CWMD-related education available only through U.S. Government

channels, a substantive research component, and CWMD community-building opportunities through a two-year colloquium taught by the NDU CSWMD in partnership with Missouri State University. The program currently consists of 17 DoD civilian and military students.

Emerging Leaders in Biosecurity Initiative (ELBI)

2012 was the inaugural year for ELBI, which aimed to establish a network and build a community of high-performing, motivated young professionals seeking careers in biosecurity and provide them with special opportunities to interact with peers and current leaders in the field, advance their knowledge of key biosecurity issues, and contribute ideas to policy and scientific discussions. Critical components of the ELBI include the Best Workshop and Annual Symposium in Washington, D.C.; the ELBI Fellows Seminar at the Naval Postgraduate School in Monterey, CA; the ELBI Network Webinar Series, hosted by senior experts in biosecurity; and the Center for Biosecurity Congressional Seminar Series, providing advanced expertise for Congressional staffers and policy makers on science related to current biosecurity legislation.

U.S. Army

The U.S. Army continues to leverage key facilities such as the West Desert Test Center and Center for National Response, in Standard, WV, as well as the Terry Center, the Army's flagship facility at FLW, and the Muscatatuck Urban Training Center, in Butlerville, IN. Through the USACBRNS, the DoD trains and maintains a flexible and responsive CBRN Response Enterprise, which consists of 55 NG WMD-CSTs, 17 NG CERFPs, 10 NG HRFs, one DCRF, and two C2CREs. Additionally, the U.S. Army 20th Support Command CBRNE completed multiple domestic and international training exercise events, including VIBRANT RESPONSE 12, where the DCRF unit executed DSCA missions, as well as an interagency exercise that validated their Nuclear Disablement Team in conducting the National Technical Nuclear Forensics mission set and participation in an annual exercise in support of Eighth U.S. Army.

U.S. Air Force

The USAF continues to assess its CBRN defense requirements and develop more effective ways to employ equipment and CBRN specialists, such as Emergency Management and Bioenvironmental Engineer personnel, to accomplish chemical detection in the aftermath of attacks. The USAF reviewed a compilation of lessons learned from Operation TOMODACHI to update its Counter-Radiological Warfare CONOPS. A Counter-CBRN Commander's Guide was released in the last year that provides an overview of available CBRN defense information for installation commanders. USAF CBRN responders, including Emergency Management, Bioenvironmental Engineer, and Fire Protection Airmen, participated in an Integrated CBRN Evaluation and Training event at the Center for National Response in West Virginia. The event helped refine the chemical and radiological incident response skills for these career fields and further defined integrated team response procedures. Additionally, in FY 2012, the USAF developed two Virtual Learning Center Courses, six Qualification Training Packages, and two Advanced Distributed Learning Service Courses for CBRN responders. Through its relationship with USACBRNS, the USAF trained 223 personnel in the CBRN Responders Course and awarded DoD HAZMAT certifications in FY 2012.

U.S. Navy

The U.S. Navy continued to align Office of the Chief of Naval Operations (OPNAV)-level instructions concerning DoD Survivability guidance. Two OPNAV-level instructions have been revised and approved: OPNAV Instruction (OPNAVINST) 3400.IOG, *Chemical, Biological, and Radiological (CBR) Defense Requirements Supporting Operational Fleet Readiness*, which discusses roles and responsibilities for the Chief of Naval Operations Executive Agent for CBRN Defense; and OPNAVINST 9070.1A, *Surface Ship*

Survivability, which addresses all aspects of ship survivability. In addition, the Navy has drafted a revision of OPNAVINST 340 1.3B, *Nuclear Survivability Policy for Navy and Marine Corps Systems*, which establishes policy and assigns responsibility for implementing nuclear survivability into Navy and USMC systems and platforms. The Navy is also updating the *Naval Ships' Technical Manual (NSTM) 070*, for Nuclear and Radiological Defensive Measures, and *NSTM 470*, for CB Defensive Measures.

U.S. Marine Corps

The USMC has incorporated CBRN awareness and understanding into training and readiness manuals at all levels of training and operational planning. Annually, Marines are trained using the individual training standards outlined in the Marine Corps Common Skills manuals and Marine Corps Order 3400.3G, *CBRN Defense Training Requirements*. The USMC CBRN School at FLW continues to lead the consolidation of the Interservice Training Review Organization (ITRO) CBRN Warrant Officer Basic Course with USMC and U.S. Army CBRN Warrant Officers. The USMC and U.S. Army are preparing to conduct another ITRO study for an advanced Chief Warrant Officer course with USACBRNS as the lead. In conjunction with CBRN training, all Marines complete an IPE confidence exercise annually as well as collective CBRN training during exercises and pre-deployment training. The USMC concluded a CWMD CBA and combined the results with their CWMD Operational Concept and Marine Air Ground Task Force (MAGTF) CBRN Operating Concept into Marine Corps Warfighting Publication 3-37, *CBRN Support to CWMD Operations*. As a result of the CWMD Operational Concept and CWMD CBA, the USMC has updated the MCWP 3-37, *Marine Air Ground Task Force (MAGTF) CBRN Support for CWMD Objectives*, providing tactical-level solutions to strengthen its ability to conduct and support CWMD operations. The USMC continues to participate in international exercises in order to improve CBRN interoperability during Coalition operations.

Chemical Weapons Convention and Inspection Readiness

Chemical Weapons Convention

The CWC opened for signature on January 13, 1993, and entered into force on April 29, 1997. As of October 2012, 188 countries, including the United States, are member states of the CWC.

Organisation for the Prohibition of Chemical Weapons (OPCW)

The OPCW is charged with overseeing worldwide implementation of the CWC, and Technical Secretariat (TS) inspectors conduct continuous and non-continuous monitoring at chemical weapons (CW) destruction facilities and systematic inspections at CW storage and former CW production facilities. In 2012, the DoD hosted 16 inspections and visits at CW storage, destruction, and Schedule 1 chemical production facilities.

Preparation of Defense Installations

The DoD, Military Departments/Services, and Components have developed individual CWC implementation and compliance plans to provide guidance for their commands and activities. The Services have individually established implementation support offices, which actively participate at the DoD Chemical Weapons Implementation Working Group, provide Service policy direction, and liaise with their major commands to ensure that all military elements are fully prepared for inspections under the CWC.

All Services have held exercises to test their preparedness for short-notice CWC challenge inspections. Such exercises involve the active participation of Services, Office of the Secretary of Defense (OSD), DTRA, and other DoD and interagency representatives in the roles that they would assume during a

challenge inspection. The DoD and the Services have exercised written DoD guidance and procedures to test the operational readiness of personnel and facilities. The Services have initiated efforts to ensure that in the case of a challenge inspection, affected commands take timely and appropriate measures, based on lessons learned, to demonstrate compliance while protecting security concerns.⁹

Technical Equipment Inspection Program

To carry out its CWC verification activities, the OPCW TS purchases, maintains, and transports their inspection equipment. The Technical Equipment Inspection Program (TEI) ensures that OPCW TS verification equipment meets U.S. safety, environmental, and security requirements through a familiarization process authorized by the OPCW Conference of the States Parties. Familiarization results are documented in the U.S. Certification Report of CWC OPCW TS Equipment. The TEI verifies OPCW equipment entering and exiting the United States IAW the U.S. Certification Report. In addition, the TEI performs chemical agent monitoring of inbound equipment for all inspection teams at the point of entry to protect U.S. and OPCW personnel and prevent inaccurate findings resulting from preexisting contaminants on the OPCW verification equipment.

Accomplishments

The year 2012 marked the completion of CW destruction operations at all currently constructed and operating incinerator facilities, with operations complete at the last incinerator site at Tooele, Utah, in January. The United States has safely destroyed 89.75 percent of its chemical agent and more than 2.33 million munitions and containers. The two remaining CW sites, Pueblo, CO, and Blue Grass, KY, will utilize neutralization technology for destruction of their CW stockpiles. Pueblo, CO, is nearly complete, with the construction phase at 97 percent, and is scheduled to begin destruction operations in 2015. Blue Grass, KY, has completed 57 percent of construction and is scheduled to commence destruction operations in 2020.

In 2012, the ECBC's Chemical and Biological Forensic Analytical Center participated in and scored an "A" on the 31st OPCW Proficiency Test. This is the highest grade achievable, with no false positives/false negatives in the identification of nine reportable compounds in six samples reflecting potential CWC challenge inspection scenarios. The ECBC Forensic Analytical Center is one of two designated U.S. laboratories for analytical support of challenge inspection and OPCW proficiency tests under the CWC.

Article X Assistance and Other Assistance

IAW a condition established in the U.S. Senate's Advice and Consent to the Ratification of the CWC, the United States will provide "no assistance...other than medical antidotes and treatment" to those countries deemed ineligible to receive full Article X assistance under the Foreign Assistance Act of 1961.

Under the CWC, the DoD has provided neither CW detection equipment nor assistance in the transportation, storage, and destruction of CW to other State Parties, except that which has been provided to Russia and Albania under the DoD's Cooperative Threat Reduction Program and the ongoing destruction of recovered CW in Iraq by the U.S. Armed Forces.

⁹ Title 50 U.S. Code Section 1523, (b) 8: A summary of other preparations undertaken by the Department of Defense and the On-Site Inspection Agency to prepare for and to assist in the implementation of the convention, including activities such as training for inspectors, preparation of defense installations for inspections under the convention using the Defense Treaty Inspection Readiness Program, provision of chemical weapons detection equipment, and assistance in the safe transportation, storage, and destruction of chemical weapons in other signatory nations to the convention.

In FY 2012, U.S. Central Command (USCENTCOM) provided CWC subject matter expertise and guidance to sensitive planning efforts and to deployed forces in the USCENTCOM AOR. During this period, USCENTCOM shared lessons on CW recovery in Iraq with U.S. African Command, who was working the Libya CW recovery effort.¹⁰

Biological Weapons Convention

The BWC bans the development, production, stockpiling, acquisition, and retention of microbial or other biological agents or toxins of types and quantities that have no justification for prophylactic, protective, or other peaceful purposes and the weapons, equipment, or means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict. The BWC entered into force on March 26, 1975.

The U.S. Government will continue to face new and emerging biological threats as innovations in life sciences continue. The *National Strategy for Countering Biological Threats* (2009) identifies the BWC as the premiere forum for global outreach and coordination on the full scope of risk management activities. Accordingly, at the 2011 Seventh Review Conference of the BWC, the U.S. Secretary of State announced the launch of the U.S. Government's Bio-Transparency and Openness Initiative, which featured the invitation to foreign dignitaries to tour a U.S. Government biodefense facility.

Accomplishments

In July 2012, the first ever BWC Bio-Transparency Site Tour was conducted at Fort Detrick, MD. The event included tours of the USAMRIID and the National Biodefense Analysis and Countermeasures Center, a DHS facility on the National Interagency Biodefense Campus at Fort Detrick, Maryland. The DoD hosted nine Ambassadorial representatives from a wide variety of countries as well as a member of the BWC's Implementation Support Unit.

This visit underscored the commitment to being transparent in our actions and proactive in our responses to biological threats and facilitated greater understanding of the nature and scope of U.S. biodefense activities with other BWC States Parties.

Defense Advanced Research Projects Agency Coordination

The Defense Advanced Research Projects Agency (DARPA) works with the CBDP Enterprise to develop revolutionary new CB threat detection, diagnostics, MCMs, and decontamination capabilities. In FY 2012, JSTO-CBD collaborated with DARPA for a successful partnership to support cloud-based testing and simulation for the 2012 DARPA Robotics Challenge and the Human Capabilities Projection effort, paper-based diagnostics, and improved diagnostic reagent robustness for use in austere environments. This expands a history of successes, such as transition of the Accelerated Manufacture of Pharmaceuticals program from DARPA to the MCMI that encompasses efforts for the DoD regulatory science, innovative manufacturing platforms, and the ADM capability. Another example is the Modular Immune *in vitro* Constructs technology, an early vaccine candidate assessment from the DARPA Rapid Vaccine Assessment program, which was transitioned to both JSTO-CBD and JPEO-CBD for validation.

¹⁰ Title 50 U.S. Code Section 1523, (b) 7: A description of the chemical warfare defense preparations that have been and are being undertaken by the Department of Defense to address needs which may arise under article X of the Chemical Weapons Convention.

DARPA also provided programmatic updates, presentations, or technical expertise in the areas of threat reduction, biodefense, and biosurveillance and regulatory reviews, such as the National Academy of Sciences Committee on Cooperative Threat Reduction for CBRN, the FDA MCM Regulatory Science Symposium, and the JASON Study with the U.S. Federal Bureau of Investigation. More importantly, the CBDP Enterprise is collaborating with DARPA, and is in talks with expanding with the CDC, on innovative diagnostic sample collection, preservation, and analysis technologies. These collaborations will enhance the ability of DoD and the nation to quickly identify a disease and initiate the appropriate treatment. DARPA and JSTO-CBD are also working to mature these technologies to address specific Warfighter needs.¹¹

CBDP International Activities

International Collaboration:

International collaboration promotes the formation of strategic relationships and fosters information sharing, collaborations, and technology innovations. In FY 2012, CBDP international efforts included:

1. Strengthening current partnerships with the United Kingdom, Canada, New Zealand, Australia, Japan, Czech Republic, and Israel
2. Increasing engagement and/or building new partnerships with India, ROK, Singapore, and Poland
3. Continuing multilateral engagement through fora such as the CBR MOU, the Technical Cooperation Program (TTCP), and NATO, maintaining burden sharing activities and leveraging multiple national programs
4. Developing and managing CB defense international agreements, including Information Exchange Agreements and Project Agreements with India, Israel, and ROK.

The Australia, Canada, United Kingdom, and United States have agreed upon a CBR MOU Enterprise with the objective of addressing technology gaps unique to CWMD missions and goals, pursuing multiple technical approaches, and often offsetting resource requirements. In May 2012, a comprehensive review of the collaborations occurred at the Joint CBR MOU/TTCP-Chemical Biological Defense (TTCP-CBD) Group meeting. The CBR MOU and TTCP-CBD Group leadership agreed to merge under a single collaborative enterprise that will manage all efforts from early phase R&D through advanced development and acquisition. A report on the final operating concept is anticipated by October 2013. In addition, the CBR MOU has agreed to a Quadrilateral Medical Countermeasure Consortium concept, which will identify and validate emerging needs that will support public health and military goals for all member nations.

Collaborations between the CBDP and Israeli Ministry of Defense (IMOD) flourished in FY 2012. In March 2012, the CBDP expedited the execution of a Terms of Reference between the Israeli Office of the Assistant Minister for CBRN Defense and the U.S. OASD(NCB) with the purpose of facilitating DoD-IMOD collaborations in the CB defense areas, including Joint R&D, doctrine sharing, Joint exercises and training, crisis response and CM, risk mitigation, and other defense technology and acquisition-related efforts. CBDP is aggressively working to strengthen this relationship and is leading the development of

¹¹ Title 50 U.S. Code Section 1523, (b) 10: A description of the coordination and integration of the program of the Defense Advanced Research Projects Agency (DARPA) on basic and applied research and advanced technology development on chemical and biological warfare defense technologies and systems under section 1701(C)(2) with the overall program of the Department of Defense on chemical and biological warfare defense.

multiple other collaborative efforts between the JPEO-CBD, the U.S. Army 20th Support Command (through USEUCOM), and the Israeli NBC Center.

Path Forward

The DoD will continue to invest in CBRN defense efforts to define and develop transformational capabilities, provide operational capabilities to the Joint Force, sustain the Force to operate jointly and effectively, and improve management practices to fulfill Enterprise strategic roles and missions. The FY 2012 accomplishments support the CBDP Enterprise mission to enable the Warfighter and the nation to deter, prevent, protect, mitigate, respond, and recover from CBRN threats and effects as part of an end-to-end, layered, integrated defense. Throughout FY 2012, the CBDP Enterprise undertook extensive efforts to further integrate, align, and focus Enterprise efforts to address defense policy set by public law, national strategies, Departmental Directives and Instructions, and higher headquarters' guidance. Highlighted below are some key efforts that will guide and focus CBDP integration and prioritization.

- The CBDP established the Laboratory Advisory Board, consisting of leaders from the DoD laboratories performing CBDP RDT&E. This forum is advancing DoD capabilities in CB defense by building a closer working partnership between the DoD CBDP components, organizations, and laboratories and will serve to support the CBDP Enterprise through advice and recommendations on overarching issues concerning the support and activities of the laboratories.
- The CBDP held its first Strategic Portfolio Review on October 1-5, 2012, to provide CBDP Executives an assessment on the objectives and alignment of portfolio investments that provide key end-state capabilities to the Joint Force and the nation to achieve the CBDP Enterprise's mission and vision. Both an external panel and an internal panel provided observations that will enable the CBDP to identify gaps and strengthen the program.¹²
- In FY 2012, the CBDP 2020 Enterprise Review was completed. This review was informed by stakeholders from the across the CBDP to identify and evaluate opportunities for further strengthening of the program. The Enterprise Review culminated in the Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs (ASD(NCB)) publishing the *CBDP Strategic Plan* in FY 2012. Simultaneously, the CBDP completed a review of management practices, which resulted in the publication of a revised Business Plan that articulates a new framework for the program's governance, coordination, metrics, and measures of performance. The 2012 *CBDP Strategic Plan* reflects the need to work strategically with interagency, international, and nongovernmental partners in meeting Warfighter requirements; guides the Enterprise in managing risk, monitoring progress, and ensuring sound business practices; and responds to both the evolving threat and the fiscal environment by setting a vision to align resources to meet four goals:
 1. Equipping the force to successfully conduct military operations to prevent, protect, and respond to CBRN threats and effects
 2. Preventing surprise by anticipating CBRN threats and developing new capabilities for the Warfighter to counter emerging threats
 3. Maintaining infrastructure to meet and adapt current and future needs for personnel, equipment, and facilities within funding constraints

¹² Title 50 U.S. Code Section 1523, (b) 5: Measures taken to improve overall management and coordination of the chemical and biological defense program.

4. Leading the CBDP Enterprise Components to integrate and align activities to fulfill the CBDP mission.
- Additionally, the ASD(NCB) prepared the *Department of Defense Medical Countermeasures Initiative Strategic Guidance* in FY 2012. This strategic guidance provides the overarching direction for establishing the DoD MCM ADM capability with a coordinated S&T effort, complementing other U.S. Government actions to protect the American people from CBRN threats and EID agents. MCMI will provide the innovative S&T base and critical flexible vaccine and therapeutic manufacturing capability to ensure a rapid response for our Warfighters, first responders, and civilian populations. The ASD(NCB)'s intent is to ensure that the DoD MCMI is linked in a continuous and efficient process to similar interagency efforts to leverage the advantages these combined capabilities provide to more efficiently and affordably develop and field MCMs for the nation.

Through all these initiatives, the Department's efforts on defending against the CB threat will continue to strengthen as the CBDP focuses and guides the Enterprise towards supporting the Warfighter and the nation. In an increasingly constrained fiscal environment, the CBDP must prioritize increasing requirements to counter WMD threats; address numerous national, Departmental, Service, and Combatant Command priorities; and allocate available resources to balance the realization of modernization goals and objectives. This prioritization will facilitate continued delivery of militarily significant, multi-purpose capabilities that, when combined with appropriate DOTMLPF-P integration, will enable prevention, protection, mitigation, response, and recovery from CBRN attacks in defense of the Warfighter and the nation.

ENCLOSURE A: FY 2012 CDBP FIELDING QUANTITIES

JPM	Product	USA	USAF	USN	USMC	USCG	Total
BD	M31A2 BIDS	56					56
CA	FOX M93A1	6					6
	IPDS-LR			23			23
	JCAD M4	4,895		737			5,632
	JCAD M4A1	6,056					6,056
	JCBRAWM (M329)	211					211
	JNBCRS2	15					15
	M98 JBPDS	1		12			13
	NBCRV VCT	10					10
	GN	IPP	3	5	4		
IS	JWARN				45		45
P	JSTDS-SS (M26)	932		48	155		1,135
	JSGPM		52,527	106,000	10,000		168,527
	JSAM MPU-6 Apache	1,129					1,129
	JSAM RW						0
	JSPDS (RSDL)*	12		10,602			10,614
	M20A1 SCPE						0
	AFS	50,000	18,000	18,000	19,000		105,000
	JB2GU nFR	109,000	39,240	42,516	30,520		221,276
	CPS-BKFT			1			1
	JC3	4,344					4,344
Sub-Total		176,670	109,772	177,943	59,720	0	524,105
Medical Systems Acquired from the Strategic National Stockpile							
CBMS	AVA	415,470	90,730	147,960	80,740	3,760	738,660
	SMALLPOX	130,500	92,200	48,400	32,400	6,200	309,700
Sub-Total		545,970	182,930	196,360	113,140	9,960	1,048,360
Grand Total		722,640	292,702	374,303	172,860	9,960	1,572,465

*In boxes (there are 60 RSDL packets in a box, which would equal 636,840 individual packets of RSDL for FY 2012).

ENCLOSURE B: JRO-CBRND EXPERIMENTS AND STUDIES

Experiments and studies conducted by JRO-CBRND in coordination with the Joint Experimentation and Analysis Division (JEAD) and National Defense University (NDU), or under contract by the Institute for Defense Analyses (IDA), are detailed below.

Experiment/Study	Description	Status
Non-Traditional Agents Guide Study (IDA)	Developed non-material solutions for dealing with NTAs	Complete
Chairman of the Joint Chiefs of Staff Guide 3215, Nontraditional Agents	Established formal approach to procedures for countering NTAs	Complete
Chemical and Biological Defense Planning Scenarios (IDA)	Established validated CBRN defense-specific scenarios derived from Secretary of Defense-approved Defense Planning Scenarios	Complete
Filovirus Analysis (IDA)	Established procurement requirement level for countermeasures	Complete
Medical Operational Risk Assessment of CBRN Threats	Established formal risk assessment methodology to inform medical requirements for biological threats	Complete
Medical Operational Risk Assessment of Medical Radiobiology Advisory Team (MRAT) Assessment	Established formal risk assessment methodology to inform medical requirements on radiological hazards	Complete
OSD-Directed CWMD Force Structure Assessment	Assessed the capability and capacity of the Joint Force to conduct elimination, interdiction, and CM	Complete
MRAT Assessment	Established formal risk assessment methodology to inform medical requirements on radiological hazards	Complete
Biological Protective Posture Reduction (JEAD)	Examined ways of tailoring protective posture in order to reduce Soldier burden and lessen reduction in combat power	Complete
Concept of Operations in an NTA Contaminated Area (JEAD)	Examined methodologies for dealing with NTAs. Informed CJCS Guide 3215 noted under studies	Complete
Defense Planning Guidance-Directed Study	Examining how the CBDP Enterprise enhances CWMD Force Posture across interdiction, elimination, protection, and CM	Ongoing
Approach Study #1 – Other than Vapor Hazard Effects Study (IDA)	Examining the optimal way to address challenges from and to assess the operational impact of new or modified chemical agents that differ from traditional agents based on their physical state or lack of vapor signature	Ongoing
Approach Study #2 – Unforeseen	Identifying specific achievable	Ongoing

Hazards Studies (Part I-Chemical, Part II-Biological) (NDU)	actions to improve or maintain the CBDP Enterprise's ability to respond to strategic technical surprise	
Approach Study #3 – CBDP Risk Assessment Process Development (JSTO-CBD/JPEO-CBD)	Examining how the CBDP Enterprise conducts risk based analysis in order to inform requirements. Funded by JPEO, managed and conducted by JSTO CBI, JRO oversight; important in support of JRO CSA analysis way ahead	Ongoing
Advanced Threat Study #1 – Advanced Toxins (IDA)	Examining if advanced and novel toxins will be a significant operational risk after 2019. If so, what is the risk? If we don't know, what are the key information gaps in assessment?	Ongoing
Seabased Forcible Entry in a CBRN Environment Operational Line-of-Experimentation	Examining the key areas in which Operational Experimentation will have the most impact over the next six years and which areas the Experimentation ICT should prioritize	Ongoing
Elimination Operational Experiment (JEAD)	Developing community lexicon; clarifying roles and responsibilities; identifying required capabilities; describing how elimination operations are integrated into and support strategic objectives	Ongoing
Module 1 – Seabase and Amphibious Operations	USMC/U.S. Navy focus	Ongoing
Module 2 – Lodgement and Unified Land Operations in a CBRN Environment	Army focus	Ongoing
Module 3 – Air Operations and Base Defense in a CBRN Environment	USAF focus	Ongoing
Warning and Impact Projection Model Concept-of-Use Experiment (JEAD)	Examining how a tool for prediction of future natural disease outbreaks could be used by the Joint Force. JSTO-CBD funded. JRO-CBRND conducted/oversight	Ongoing

ENCLOSURE C: FY 2012 CWMD AND CBRN RESPONDER TRAINING AND EDUCATION

AFRRI Courses	Attendees
Medical Effects of Ionizing Radiation	
FY 12 Total Number of Students	669
FY 11 Total Number of Students	452
FY 10 Total Number of Students	501

DMRTI Courses	Attendees
Clinicians Long Course	1394
Clinicians Short Course	19,525
Operators Long Course	1,551
Operators Short Course	24,064
Basic Awareness Course	35,112
Executive Commander's Course	804
FY 12 Total Number of Students	82,450

HRF and CERFP Courses	Attendees
Individual Training	
NIMS 100, 200, 300, 700, and 800b	7,950
HAZMAT Operations	7,950
Emergency Response to Terrorism	7,950
Basic Search and Extraction Course	1,350
CMD Element Attendance of Extraction Staff Planning Course	108
Emergency Trauma Training	1,215
Collective Training	
Regional Joint Interagency Exercise	3,570
External Evaluation	3,570
Local Exercise	11,498
FY 12 Total Number of Students	45,161

Leader Development and Education Courses	Attendees
CBDP Sponsored	
CBDP and NDU CSWMD	17
JRO-CBRND Sponsored	
Joint and Combined Warfighting School (JCWS) CWMD Focus Study	574
USNORTHCOM CWMD Level II	17
USNORTHCOM Defense Support to Civil Authorities Mobile Training Team	413
JCWS Purple Guardian Exercise	216
U.S. Army Command and General Staff School, CWMD & Homeland Security Tracks	359
U.S. Army CBRN Captain's Career Course CM Module	156
U.S. Army Military Police Captain's Career Course CM Module	234
Joint Senior Leaders' Course	101
U.S. Army Engineer Captain's Career Course CM Module	414
U.S. Army War College, Strategic Decision Making Exercise	376
U.S. Army and USAF Command and Staff Colleges, Joint Interagency Planning Staff Exercise	330
Joint Land Aerospace Sea Simulation (JLASS) Exercise	129

USMC Command and Staff College, National Response to Catastrophic and Disruptive Threats Exercise	176
Air War College, Global Challenge Exercise	225
Joint Special Operations University	85
USAF Command and Staff College Joint Interagency Planning Staff Exercise Prep	75
USAF Counterproliferation Center, Johnny Appleseed Conference	200
Marine Corps War College JCLASS Prep	115
Eisenhower School, CWMD Elective	6
FY 12 Total Number of Students	4,218
FY 11 Total Number of Students	3,806
FY 10 Total Number of Students	3,163

USACBRNS Courses	Attendees
Senior Leader Course	186
Advance Leader Course	246
CBRN Basic Officer Leader-Course	330
CBRN Advance Individual Training	110
U.S. Army CBRN Captain's Career Course	1,594
CBRNE Senior Staff Planners Course	69
WMD-CST Civil Support Skills Course	236
WMD-CST Pre-Command Course	52
WMD-CST Analytical Laboratory System Course	36
WMD-CST Unified Command Suite Course	19
Operational Radiation Safety	69
Radiological Safety	49
Installation Emergency Management Planning	37
CBRN Recon for Brigade Combat Teams	65
CBRN Responders Course	416
CBRN Mass Casualty Decontamination Course	432
CBRN Warrant Officer Basic Course	14
Decontamination Procedures (Non-U.S.)	203
Technical Escort Course	267
M93 Series CBRN Recon System FOX Course	59
Joint Biological Point Detection System Course	41
Dismount CBRN Reconnaissance Course	226
Joint Senior Leader Course	59
CBRN Pre-Command Course	21
FY 12 Total Number of Students	4,836
FY 11 Total Number of Students	5,414
FY 10 Total Number of Students	5,810

USAMRICD Courses	Attendees
Field Management of CB Casualties Course	351
Medical Management of CB Casualties Course (Phase 2)	325
Hospital Management of CBRNE Incidents Course	2
Off-site Courses	28
Distance Learning via Defense Connect Online	112
FY 12 Total Number of Students	818
FY 11 Total Number of Students	1,237
FY 10 Total Number of Students	1,094

USAMRIID Courses	Attendees
Medical Management of CB Casualties Course (Phase 1)	325
Field Identification of BWAs Course	6
Field Identification of BWAs Manager's Course	5
FY 12 Total Number of Students	336
FY 11 Total Number of Students	367
FY 10 Total Number of Students	294

ENCLOSURE D: ACRONYM LIST

ACRONYM	TERM
ADM	Advanced Development and Manufacturing
AFHSC	Armed Forces Health Surveillance Center
AFRRI	Armed Forces Radiobiology Research Institute
AOR	Area of Responsibility
ARCENT	U.S. Army Central
ASD(NCB)	Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs
ASP	Analysis Support Program
ATD	Advanced Technology Demonstration
BSP	Biosurveillance Portal
BSVE	Biosurveillance Ecosystem
BWA	Biological Warfare Agent
BWC	Biological Weapons Convention
C2CRE	Command and Control CBRN Response Elements
CB	Chemical and Biological
CBA	Capabilities Based Assessment
CBDP	Chemical and Biological Defense Program
CBP	U.S. Customs and Border Protection
CBR	Chemical, Biological, and Radiological
CBRN	Chemical, Biological, Radiological, and Nuclear
CBRNE	Chemical, Biological, Radiological, Nuclear, and High-Yield Explosive
CDC	U.S. Centers for Disease Control and Prevention
CDD	Capability Development Document
CDTF	Chemical Defense Training Facility
CERFP	CBRNE Enhanced Response Force Package
CHRP	Contaminated Human Remains Pouch
CJCS	Chairman of the Joint Chiefs of Staff
CLS	Contractor Logistics Support
CM	Consequence Management
ColPro	Collective Protection
CONOPS	Concept of Operations
CONUS	Continental United States
COP	Common Operating Picture
CRP	Critical Reagents Program
CSWMD	Center for the Study of Weapons of Mass Destruction
CW	Chemical Weapon
CWA	Chemical Warfare Agent
CWC	Chemical Weapons Convention

ACRONYM	TERM
CWMD	1. Combating Weapons of Mass Destruction 2. Countering Weapons of Mass Destruction
DARPA	Defense Advanced Research Projects Agency
DCRF	Defense CBRN Response Force
DHS	U.S. Department of Homeland Security
DMRTI	Defense Medical Readiness Training Institute
DoD	U.S. Department of Defense
DoDD	Department of Defense Instruction
DOTMLPF-P	Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, Facilities, and Policy
DPG	Dugway Proving Ground
DSCA	Defense Support of Civil Authorities
DTRA	Defense Threat Reduction Agency
ECBC	U.S. Army Edgewood Chemical Biological Center
EID	Emerging Infectious Disease
ELBI	Emerging Leaders in Biosecurity Initiative
EMD	Engineering and Manufacturing Development
EPRC	Emergency Preparedness and Response Courses
EUA	Emergency Use Authorization
FDA	U.S. Food and Drug Administration
FIBWA-MC	Field Identification of Biological Warfare Agents-Managers Course
FLW	Fort Leonard Wood
FoS	Family of Systems
FRP	Full Rate Production
FY	Fiscal Year
GPD	General Purpose Decontaminant(s)
HAZMAT	Hazardous Materials
HFV	Hemorrhagic Fever Virus
HHS	U.S. Department of Health and Human Services
HRF	Homeland Response Force
HSPD	Homeland Security Presidential Directive
IB	Industrial Base
IAW	In Accordance With
IBWG	Industrial Base Working Group
IDA	Institute for Defense Analyses
IMOD	Israeli Ministry of Defense
IND	Investigational New Drug
IPE	Individual Protective Equipment
ITRO	Interservice Training Review Organization
JBAIDS	Joint Biological Agent Identification and Diagnostic System

ACRONYM	TERM
JCWS	Joint and Combined Warfighting School
JEAD	Joint Experimentation and Analysis Division
JECP	Joint Expeditionary Collective Protection
JEM	Joint Effects Model
JLASS	Joint Land Aerospace Sea Simulation
JP	Joint Publication
JPEO-CBD	Joint Program Executive Office for Chemical and Biological Defense
JPL	Joint Priority List
JPM	Joint Project Manager
JRO-CBRND	Joint Requirements Office for Chemical, Biological, Radiological, and Nuclear Defense
JSEW	Joint Service Equipment Wipe
JSGPM	Joint Service General Purpose Mask
JSTO-CBD	Joint Science and Technology Office for Chemical and Biological Defense
JWARN	Joint Warning and Reporting Network
MAGTF	Marine Air Ground Task Force
MCBC	Medical Management of Chemical and Biological Casualties
MCM	Medical Countermeasures
MCFI	Medical Countermeasures Initiative
MMO	Military Medical Operations
MOU	Memorandum of Understanding
MRAT	Medical Radiobiology Advisory Team
MS	Milestone
MTTP	Multi-Service Tactics, Techniques, and Procedures
NATO	North Atlantic Treaty Organization
NBC	Nuclear, Biological, and Chemical
NBCRV	Nuclear, Biological, and Chemical Reconnaissance Vehicle
NDU	National Defense University
NG	National Guard
NGCD	Next Generation Chemical Detector
NGDS	Next Generation Diagnostic System
NIMS	National Incident Management System
NIST	National Institute of Standards and Technology
NSTM	Naval Ships' Technical Manual
NTA	Non-Traditional Agent
NTADTS	Non-Traditional Agent Defense Test System
OASD(HA)	Office of the Assistant Secretary of Defense for Health Affairs
OASD(NCB)	Office of the Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs
OCONUS	Outside of the Continental United States

ACRONYM	TERM
OIB	Organic Industrial Base
OPCW	Organisation for the Prohibition of Chemical Weapons
OPNAV	Office of the Chief of Naval Operations
OPNAVINST	OPNAV Instruction
OSD	Office of the Secretary of Defense
PHEMCE	Public Health Emergency Medical Countermeasures Enterprise
POC	Point-of-Care
PON	Point-of-Need
R&D	Research and Development
RDA	Research, Development, and Acquisition
RDT&E	Research, Development, Test, and Evaluation
RFP	Request for Proposal
ROK	Republic of Korea
S&T	Science and Technology
SME	Subject Matter Expert
SNS	Strategic National Stockpile
SSEB	Source Selection Evaluation Board
T&E	Test and Evaluation
TEI	Technical Equipment Inspection
TIC	Toxic Industrial Chemical
TS	Technical Secretariat
TTCP	The Technical Cooperation Program
TTCP-CBD	The Technical Cooperation Program-Chemical Biological Defense
UIPE	Uniform Integrated Protection Ensemble
USACBRNS	U.S. Army Chemical, Biological, Radiological, and Nuclear School
USAF	U.S. Air Force
USAMRICD	U.S. Army Medical Research Institute of Chemical Defense
USAMRIID	U.S. Army Medical Research Institute of Infectious Diseases
USAMRMC	U.S. Army Medical Research and Materiel Command
USCENTCOM	U.S. Central Command
USEUCOM	U.S. European Command
USFK	U.S. Forces Korea
USMC	U.S. Marine Corps
USNORTHCOM	U.S. Northern Command
USSTRATCOM	U.S. Strategic Command
V&V	Verification and Validation
VRP	Virus Replicon Particle
WMD	Weapons of Mass Destruction
WMD-CST	Weapons of Mass Destruction Civil Support Team
WSLAT	Whole System Live Agent Test

