26 AUG 1998

Ref: 98-F-1877

Ms. Samar Shams
Federation of American Scientists Fund
307 Massachusetts Avenue, N.E.
Washington, DC 20002

Dear Ms. Shams:

This letter responds to your June 26, 1998, Freedom of Information Act (FOIA) request which was received in this Directorate on July 1, 1998.

The enclosed documents are provided as responsive to your request. There are no chargeable costs for processing your FOIA request in this instance.

Sincerely,

"Signed"

A. H. Passarella
Director

Enclosures:
As stated

Prepared by VOORHIES:gjv:8/18/98:DFOI:gr/pk__yl__

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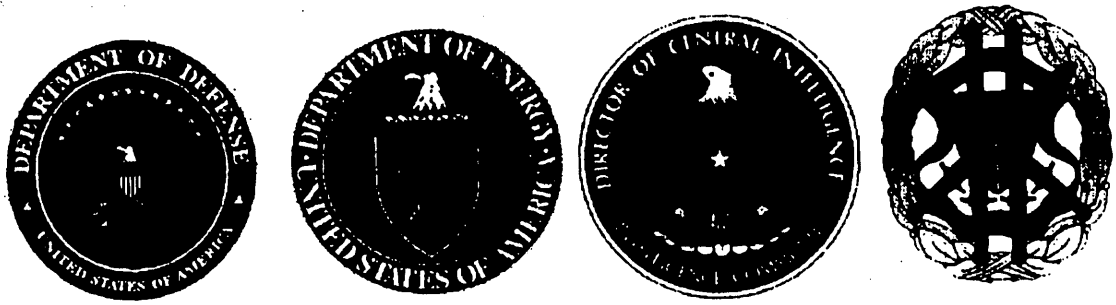
Report on Activities and Programs for Countering Proliferation and NBC Terrorism

May 1998

Counterproliferation Program Review Committee



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CPRC Report on Activities and Programs for Countering Proliferation and NBC Terrorism

May 1998

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Executive Summary

Congress directed, in the 1994 National Defense Authorization Act (NDAA), that the Counterproliferation Program Review Committee (CPRC) be established to review activities and programs related to countering proliferation within the Office of the Secretary of Defense (OSD), Department of Energy (DOE), U.S. Intelligence, and the Joint Chiefs of Staff (JCS). The high level national commitment to counter proliferation threats is reflected in the CPRC's membership. It is chaired by the Secretary of Defense, and composed of the Secretary of Energy (as Vice Chair), the Director of Central Intelligence (DCI), and the Chairman of the Joint Chiefs of Staff (CJCS). The CPRC is chartered to make and implement recommendations regarding interdepartmental activities and programs to address shortfalls in existing and programmed capabilities to counter the proliferation of nuclear, biological, and chemical (NBC) weapons of mass destruction (WMD) and their means of delivery. In the 1997 NDAA, Congress broadened the CPRC's responsibilities and specified that the CPRC also review activities and programs of the CPRC-represented organizations related to countering paramilitary and terrorist NBC threats. The findings and recommendations of the CPRC's annual review for 1998 are presented in this, its fifth annual report to Congress.

Organizationally, the Deputy Secretary of Defense has been designated by the Secretary of Defense to perform the duties of CPRC Chairman, and the Assistant to the Secretary of Defense for Nuclear and Chemical and Biological Defense Programs (ATSD(NCB)) has been designated by Congress as CPRC Executive Secretary. The CPRC Standing Committee, established in 1996, meets regularly and is actively working to perform the duties and implement the recommendations of the CPRC. The Standing Committee is composed of the ATSD(NCB) (as Chair); the Director, Office of Nonproliferation and National Security, DOE (as Vice Chair); the Special Assistant to the DCI for Nonproliferation; the Deputy Director for Strategy and Policy, Joint Chiefs of Staff (Plans and Policy, J-5); and the Assistant Secretary of Defense for Special Operations/Low-Intensity Conflict (ASD(SO/LIC)). It should be noted that the Defense Reform Initiative (DRI) currently being implemented within the Department of Defense (DoD) calls for the elimination of the ATSD(NCB) position. The Deputy Secretary of Defense is working to ensure that appropriate DoD officials will continue to support the CPRC and its Standing Committee, consistent with the CPRC's congressional charter.

To guide its program review process, the CPRC established the Areas for Capability Enhancements (ACEs) to characterize those areas where progress is needed to enhance both the warfighting capabilities of the Combatant Commanders, including the Commanders-in-Chief (CINCs), and the overall ability to satisfy the demands of U.S. nonproliferation and counterproliferation policy. The ACEs define those priority areas where additional capabilities are needed to meet the challenges posed by the proliferation of NBC weapons and their means of delivery (NBC/M), including those posed by paramilitary and terrorist NBC threats. They also serve as a basis to assess progress in meeting the mission needs of the CPRC-represented organizations for countering proliferation. The ACEs are reviewed annually to ensure that they continue to reflect the integration of the warfighting needs of the CINCs and the overarching national security objectives they support.

The ACEs reflect evolving needs and shortfalls that change as threats evolve and become better understood and as research and development (R&D) and acquisition programs mature, enabling new operational capabilities. Updated and current ACEs serve to improve the focus of future programmatic and managerial efforts to counter NBC/M proliferation and NBC terrorist threats. Each CPRC-represented organization individually prioritizes the ACEs in accordance with their own departmental mission needs to more accurately reflect each organization's response to countering proliferation and NBC terrorism. The counterproliferation ACEs for 1998 are listed in Table 1. Only one change was made in the ACEs during this year's review. ACE priority 4 (DoD priority) was broadened to include National Missile Defense (NMD) as well as theater ballistic missile active defense.

Table 1: The Counterproliferation ACEs for 1998

ACE Priorities			Areas for Capability Enhancements (ACEs)
DoD	DOE	US INTELL	
1	3	1	Detection, Identification, and Characterization of BW Agents
2	6	3	Detection, Characterization, and Defeat of NBC/M Facilities with Minimal Collateral Effects
3	8	4	Detection, Characterization, and Defeat of Underground Facilities with Minimal Collateral Effects
4	-	2	Ballistic Missile Active Defense
5	2	5	Support for Special Operations Forces and Defense Against Paramilitary, Covert Delivery, and Terrorist NBC Threats
6	4	6	Provide Consequence Management
7	-	7	Cruise Missile Defense
8	7	8	Collection, Analysis, and Dissemination of Actionable Intelligence to Counter Proliferation
9	-	13	Robust Passive Defense to Enable Sustained Operations on the NBC Battlefield
10	-	9	BW Vaccine RDT&E and Production to Ensure Stockpile Availability
11	-	14	Target Planning for NBC/M Targets
12	-	11	Prompt Mobile Target Detection and Defeat
13	1	15	Detection, Tracking, and Protection of NBC/M and NBC/M-Related Materials and Components
14	9	12	Support Export Control Activities of the U.S. Government
15	5	10	Support Inspection and Monitoring Activities of Arms Control Agreements and Regimes

The CPRC focused its annual activity and program review on identifying key R&D and acquisition program accomplishments and milestones illuminating planned near-, mid-, and long-term capability improvements. The CPRC has found that a prudent, time-phased response to the challenges posed by NBC/M proliferation and NBC terrorist threats is in place and solidly under way. Although it will take several years to achieve the goals and objectives of the numerous programs responding to these challenges, the CPRC can report that progress continues to be made in many ACE priority areas. This progress continues to strengthen U.S. capabilities for countering proliferation and NBC terrorism and includes: i) the rapid fielding of essential capabilities; ii) coordinating and focusing interorganizational R&D and acquisition activities; iii) expanding international cooperative activities; and iv) improving the integration, management, and oversight of activities and programs related to countering proliferation and NBC terrorism.

Commensurate with the seriousness of the threat, DoD, DOE, and U.S. Intelligence have each made serious commitments to enhance national capabilities to counter the proliferation of NBC/M and NBC terrorist threats. The combined DoD and DOE investment in countering these threats is over $6.4 billion for Fiscal Year (FY) 1999, approximately an 18% increase over the FY 1998 total of $5.4 billion. DoD's investment in areas strongly related to counterproliferation totals over $5.9 billion in FY 1999, of which nearly $4 billion is for air and missile defense. This compares favorably with last year's investment of just under $4.9 billion (a 20% increase due mainly to increases in active defense-related budgets), reflecting DoD's steady commitment in the face of continuing budget constraints. It must be emphasized that counterproliferation efforts leverage the substantial investments made in maintaining the requisite military forces and defense infrastructure necessary to provide for the basic common defense of the United States. DoD budgets the bulk of its counterproliferation investment in air and missile defenses (DoD ACE priorities 4 and 7); supporting inspection, monitoring, and verification activities of arms control agreements (DoD ACE priority 15); maintaining a robust NBC passive defense capability (DoD ACE priority 9); detecting and characterizing biological warfare (BW) agents (DoD ACE priority 1); supporting Special Operations Forces (SOF) and defending against paramilitary and terrorist NBC threats (DoD ACE priority 5); and prompt mobile target detection and defeat (DoD ACE priority 12). All budget figures in this report are from the President's Budget.

DOE continues to increase its investment in nonproliferation activities with $515.2 million requested for FY 1999, up 5% over last year. As part of its core national nonproliferation program, DOE focuses on the tracking and control of nuclear weapons-related materials and components (DOE ACE priorities 1 and 9), supporting the inspection and monitoring of arms control agreements (DOE ACE priority 5), and defending against and managing the consequences of covert delivery and NBC terrorist threats (DOE ACE priorities 2 and 4). DOE is also continuing its technology development efforts in the detection, identification, and characterization of BW and chemical warfare (CW) agents (DOE ACE priority 3). U.S. Intelligence's investments in programs to counter proliferation are discussed in a separately bound "Intelligence Annex" to this report.

Since the May 1997 CPRC report was submitted, the following key activities have been undertaken and accomplishments achieved by DoD, DOE, and U.S. Intelligence to enhance the interdepartmental response to countering NBC/M proliferation and NBC terrorist threats.

Summary of Key DoD Activities

- ***DoD's Counterproliferation Initiative and the Counterproliferation Council.*** The Defense Counterproliferation Initiative is the DoD-wide effort to meet the military challenges posed by the proliferation of NBC/M. To ensure that DoD's broad counterproliferation policy objectives are met and that implementation of the Counterproliferation Initiative is integrated and focused, the Secretary of Defense established the Counterproliferation (CP) Council composed of senior DoD civilian and military officials in April 1996.

- ***DoD's Counterproliferation Support Program.*** At the heart of DoD's Counterproliferation Initiative is the Counterproliferation Support Program, established in 1994 specifically by the NPRC/CPRC to address DoD shortfalls in counterproliferation capabilities. This program, currently managed by ATSD(NCB), uses its budget to leverage DoD R&D and acquisition programs to meet the counterproliferation priorities of the CINCs and accelerate the deployment of enhanced capabilities to the field. Currently, the Counterproliferation Support Program is targeting several of the 15 ACEs where leveraged support can be decisive. The Counterproliferation Support Program also conducts technology development activities with the DOE National Laboratories, U.S. Intelligence, and several DoD agencies and organizations.

- ***The Counterproliferation CONPLAN 0400 and the CINCs' Counterproliferation Required Capabilities.*** The CJCS's *Counterproliferation CONPLAN 0400*, which directs CINC planning to implement national level counterproliferation policy, has been coordinated by the Joint Staff and is being used by each of the CINCs to develop their own area-specific counterproliferation CONPLANs (concept plans). These area-specific CONPLANs are due to the Joint Staff for review in August 1998. The CINCs' Counterproliferation Required Capabilities are currently being revalidated by the Joint Staff.

- ***Implementing the Comprehensive Nuclear Test Ban Treaty (CTBT).*** Since the establishment of the CTBT Preparatory Commission (PrepCom) and the Provisional Technical Secretariat (PTS) in early 1997, implementation activity has increased considerably. DoD's Deputy for Nuclear Treaty Programs has kept pace with CTBT implementation by enhancing R&D activities to fulfill the President's CTBT Safeguards program; installing Treaty-required International Monitoring System (IMS) stations on U.S. territory and working with over 10 other Treaty signatories on bilateral cooperative IMS installation projects; advancing the transition of the International Data Center to the PrepCom; developing specifications and an international tender offer for the Treaty's Global Communications Infrastructure; and continuing to provide a wide range of technical support to the PrepCom and PTS.

- ***The Quadrennial Defense Review (QDR) and the National Defense Panel (NDP).*** The QDR, issued in May 1997, outlines an overarching defense strategy for the 21st century, including ensuring preparedness against NBC/M proliferation and NBC terrorist threats. Its tenets are to *institutionalize* counterproliferation as an organizing principle in every facet of military activity and *internationalize* these efforts by encouraging friends, allies, and future coalition partners to cooperate with the U.S. in countering these threats. The QDR emphasizes the need for increased focus and funding for enhanced capabilities to counter NBC/M threats, including improving the CW/BW detection and protection capabilities of U.S. forces and maintaining NMD as a high

DoD priority. The NDP report underscores the QDR's findings to improve force protection, detection, and active defense capabilities against NBC weapons.

- ***Counterproliferation Plus-Up Funding.*** In the QDR, the Secretary of Defense directed a $1 billion increase in funding over the Future Years Defense Plan (FYDP, i.e., FY 1999-2003) to address shortfalls in counterproliferation-related capabilities, primarily for protective measures against CW threats. The budget issue review team, composed of OSD, Joint Staff, and military department representatives, allocated $732 million for passive defense programs, $146 million for counterforce programs, and $87 million for U.S. Special Operations Command (USSOCOM) programs. A planned increase of $35 million for active defense programs was not allocated.

- ***Ongoing Advanced Concept Technology Demonstrations (ACTDs).*** To accelerate the fielding of advanced technologies and capabilities to counter NBC/M threats, four ACTDs are under way: i) the first Counterproliferation Counterforce CP1 ACTD is enhancing capabilities for defeating CW/BW targets, ranging from soft aboveground facilities to hardened underground facilities, with minimal collateral effects; ii) the follow-on Counterproliferation Counterforce CP2 ACTD is providing expanded options for defeating hardened and underground NBC/M targets while minimizing collateral effects; iii) the Joint Biological Remote Early Warning System (JBREWS) ACTD is providing enhanced capabilities for early warning of BW attacks; and iv) the Portal Shield (formerly Air Base/Port) ACTD is improving capabilities for detection and warning of BW attacks at fixed facilities.

- ***Proposed Restoration Operations ACTD.*** As a result of the Consequence Management 911-Bio ACTD, the "Chem War 2000" exercise, and a number of studies conducted by the Air Force and the Joint Staff, a new "Restoration Operations" ACTD is under development to examine the doctrine, tactics, techniques, procedures, and equipment required to recover quickly from CW/BW attacks on ports, airfields, and other fixed sites.

- ***Hard, Deeply Buried, and Tunnel Target Defeat Programs.*** The Joint Service Hard and Deeply Buried Target Defeat Capability acquisition program is analyzing over 60 weapon system concepts and plans to recommend a small subset for further development to the Defense Acquisition Board in October 1998. The Defense Special Weapons Agency (DSWA) Hard Target Defeat and Tunnel Defeat Demonstration programs continue to evaluate technology and operational needs for detecting, characterizing, and defeating this class of targets.

- ***Reprioritized Funding for USSOCOM.*** Counterproliferation is a principal mission of USSOCOM, and Special Operations Forces may be called upon to enforce U.S. counterproliferation policy long before the authorization of direct military action. SOF can carry out measures to interdict shipments of NBC weapon-related materials, provide deep reconnaissance to locate NBC/M, and conduct precision strikes to capture or neutralize them. In recognition of these capabilities, the Deputy Secretary of Defense has again directed additional funding to supplement SOF-related budgets over the FYDP.

- ***DoD's Force Protection Initiative.*** Efforts by the CINCs, Services, DoD agencies, and the Joint Staff to enhance force protection capabilities (including against NBC weapon threats) for U.S. forces worldwide continue. Requirements are being defined, and R&D and equipment needs are being coordinated throughout DoD. Force protection site assessments are being conducted by DSWA, and 100 assessments are planned during 1998.

- ***The Domestic Preparedness Initiative.*** DoD is the lead federal agency in enhancing local first responder capabilities to respond to terrorist incidents involving NBC weapons. Led by ASD(SO/LIC), DoD is: i) conducting "Train the Trainer" programs for emergency responders in the 120 largest U.S. cities; ii) establishing a Joint Chemical Biological Rapid Response Team and enhancing the Chemical Biological Incident Response Force (CBIRF); iii) supporting the 911-Bio ACTD and other R&D activities to improve consequence management capabilities; iv) establishing satellite broadcast training and Chemical/Biological and Stress Management Special Medical Augmentation Response Teams for the medical management of CW/BW casualties; and v) working closely with the Federal Bureau of Investigation (FBI), the Federal Emergency Management Agency, and other federal, state, and local authorities to provide DoD-unique NBC response capabilities and expertise to improve overall intergovernmental emergency response.

- ***Key Active Defense Activities.*** Following a "family of systems" approach, DoD continues to press forward in the development and deployment of enhanced systems for active defense against ballistic missile, air, and cruise missile threats. Elements of the PATRIOT Advanced Capability (PAC-3) system are being deployed, and procurement of additional assets is under way. PAC-3 and Navy Area Defense system testing and upgrades development are continuing. Theater-wide defense systems and the Airborne Laser are on track to reach their scheduled deployment targets. The National Missile Defense program is in the final stages of selecting a Lead System Integrator and on track for an FY 2000 deployment decision. As a result of congressional plus-up funding, several active defense programs were restructured to accelerate their development pace and reduce technical risk through additional testing.

- ***Key U.S. Air Force Counterproliferation Activities.*** The Air Force developed a comprehensive Master Plan for Counterproliferation describing its strategy as a force developer and provider by assessing capabilities, defining Air Force counterproliferation requirements to support the warfighting CINCs, identifying shortfalls and deficiencies across the counterproliferation mission spectrum, and prescribing measures to correct them. The *Counter Chemical and Biological Warfare Roadmap* was developed to further define Air Force counterproliferation capabilities. Based on CINC war game results, three new studies were initiated: *Counter Chemical and Biological Warfare Operations Counterforce*, *Sustaining Air Mobility Operations in a WMD Environment*, and *Fighting the Base*. To address one important shortfall, the Air Force has undertaken concept exploration to identify the most promising alternatives to neutralize or defeat CW/BW agents while minimizing collateral damage and effects. The Air Force also established two integrated process teams (IPTs): the NBC Ability-to-Survive-and-Operate IPT and the Nuclear and Counterproliferation IPT.

- ***The Joint Vaccine Acquisition Program for Biological Defense.*** The need to produce vaccines at a pace rapid enough to match any anticipated battlefield demand is a high CPRC and CINC

priority. A solid acquisition strategy based on comprehensive analyses is in place, and a 10-year prime systems contract to develop and procure Food and Drug Administration (FDA)-licensed vaccines to protect U.S. forces from BW agents was awarded in November 1997. Inoculation of active duty and reserve forces with a commercially available, FDA-licensed anthrax vaccine is under way.

- ***Science and Technology Strategic Planning for Counterproliferation.*** The strategic planning process for DoD's science and technology (S&T) program was enhanced again this year with the issuance of DoD's third *Joint Warfighting S&T Plan.* "Chemical/Biological Warfare Defense and Protection" and "Counter Weapons of Mass Destruction" are two of the ten Joint Warfighting Capability Objectives identified in the plan. The *Joint Warfighting S&T Plan* is incorporated into the Defense Planning Guidance, and its Joint Warfare Capability Objectives receive funding priority in DoD's FYDP.

- ***Other Key DoD Activity and Program Accomplishments.*** Well over 100 DoD programs are strongly supporting national efforts to counter NBC/M proliferation and NBC terrorist threats. Over the past four years, substantial progress has been made in these programs and other activities to improve fielded counterproliferation, nonproliferation, and NBC counterterrorism capabilities and to establish the necessary groundwork for continued advances. Selected accomplishments of these activities and programs are highlighted in Table 2.

Summary of Key DOE Activities

- ***Chemical and Biological Agent Detection R&D.*** This program was established at congressional direction in recognition of the Department's significant expertise in the chemical and biological sciences resident at the National Laboratories. The development and selection of R&D projects is closely coordinated with DoD and U.S. Intelligence. Projects have been funded based on the Laboratories' expertise and potential to address CW/BW military defense needs and the consequence management needs of civilian first responders.

- ***Detecting and Characterizing Worldwide Production of Nuclear Materials and Weapons.*** DOE continued development of complementary active and passive remote sensing technologies to detect and characterize foreign nuclear materials production activities. Acquisition of special nuclear materials is the most important step in nuclear weapons proliferation. Therefore, the ability to detect the processes associated with the production of special nuclear materials is a critical proliferation prevention capability, and the ability to detect such production remotely is a powerful deterrent. A highlight during the past year was the ground-based demonstration of a hyperspectral infrared imaging spectrometer to detect and identify proliferation-related effluents.

- ***Monitoring Worldwide Nuclear Testing.*** DOE continues to develop ground-based technical methods specifically intended to support the CTBT IMS. By providing critical forensic data and unequivocal proof of a nuclear detonation, radionuclide monitoring techniques serve as an important tool for CTBT verification. DOE developed an automated radionuclide particulate detector that was commercialized by the Air Force. The detector system was delivered to the Air Force in January 1998. The prototype of an automated xenon gas detector will be delivered

Table 2: Highlights of DoD's Response to the Counterproliferation ACEs

DoD ACE Priority	Selected Accomplishments in DoD Counterproliferation Programs
1. Detection, Identification, and Characterization of BW Agents	• Developing the Joint Biological Point Detection System for all Services • Accelerated development of advanced early warning BW agent detection systems • Continuing the Portal Shield ACTD and the JBREWS ACTD • Continuing production of the Biological Integrated Detection System P3I to equip a second Army BW detection company
2. Detection, Characterization, and Defeat of NBC/M Facilities with Minimal Collateral Effects	• Conducted integrated sensor, weapon, and targeting tool field tests for NBC/M and underground facility defeat and collateral effects mitigation as part of the Counterproliferation CP1 ACTD • Initiated the follow-on Counterproliferation Counterforce CP2 ACTD • Agent defeat weapons system concepts collected from industry and DoD/DOE labs for evaluation
3. Detection, Characterization, and Defeat of Underground Facilities with Minimal Collateral Effects	• Initiated the joint DSWA/DIA Tunnel Defeat Demonstration Program, integrating intelligence, operational, and acquisition priorities for tunnel defeat • See ACE #2 entries above
4. Ballistic Missile Active Defense	• Several programs restructured to accelerate acquisition and reduce technical risk • Successful flight tests for PATRIOT PAC-3 missile and NMD kill vehicle concepts • Airborne Laser successfully completed PDRR Program Requirements Review and scaled laser tests; fabrication of the first laser module initiated • THAAD and Airborne Laser components exercised in various field exercises • Navy initiated actions to accelerate Navy Area TBMD ship deliveries within FYDP • National Missile Defense elevated to Major Defense Acquisition Program and Lead System Integrator contractor to be selected in May • SBIRS-High EMD contract for 5 satellites awarded and Preliminary Design Review completed • Theater ballistic missile defense lower-tier system procurement transitioned back to BMDO
5. Support for Special Operations Forces and Defense Against Paramilitary, Covert Delivery, and Terrorist NBC Threats	• Continued development of specialized technologies and equipment prototypes to assist SOF and Explosive Ordnance Disposal teams in countering CW/BW threats • Enhanced coordination of Joint Service exercises and readiness sustainment activities • Formed organizational structure and initiated facility assessments to enhance U.S. force protection
6. Provide Consequence Management	• Improved the Marine Corps Chemical Biological Incident Response Force • Provided consequence management training for First Responders to respond to CW/BW attacks • Provided satellite broadcast training on medical management of BW casualties • Establishing regional Army Special Medical Augmentation Response Teams
7. Cruise Missile Defense	• Technology sharing and synergy with ballistic missile defense programs is continuing
8. Collection, Analysis, and Dissemination of Actionable Intelligence to Counter Proliferation	• *Athena* counterproliferation intelligence "information space" under development to support mission planning and operations • See the Intelligence Annex to this report for additional programs
9. Robust Passive Defense to Enable Sustained Operations on the NBC Battlefield	• Continued deployment of critical NBC detection and warning, individual and collective protection, and decontamination systems for use throughout the battlespace • Continuing advances in CW/BW medical defense RDT&E • Additional funding for CW/BW defensive equipment to meet operational requirements
10. BW Vaccine RDT&E and Production to Ensure Stockpile Availability	• Prime systems contract awarded in November 1997 for the Joint Vaccine Acquisition Program • Fulfilled DoD prescribed stockpile level of anthrax vaccine • Decision to vaccinate U.S. forces against anthrax; vaccinations under way
11. Target Planning for NBC/M Targets	• User acceptance of integrated target planning and weaponeering tools by CINC USEUCOM for use in Bosnia as part of Operation Joint Endeavor along with other upgrades from the CP1 ACTD • CW/BW agent defeat assessment tools under development
12. Prompt Mobile Target Detection and Defeat	• Development of a foliage penetrating radar and other sensors to defeat camouflage, concealment and deception; new capabilities for near real-time exploitation of wide area imagery • Demonstrated operational utility of C4I systems for rapid dissemination of intelligence to users
13. Detection, Tracking, and Protection of NBC/M and NBC/M-Related Materials and Components	• Deployment of prototype Specific Emitter Identification System for identifying ships at sea suspected of transporting NBC/M or related materials; fleet integration via upgrades of existing signal processors with an SEI capability scheduled for FY 1999.
14. Support Export Control Activities of the U.S. Government	• Reviewed over 21,000 export license applications for military and dual-use technologies • Enhanced the "Wassenaar Arrangement," a new multinational export control framework • Militarily Critical Technologies List Part II, *WMD Technologies*, published
15. Support Inspection and Monitoring Activities of Arms Control Agreements and Regimes	• Helped Ukraine, Belarus, and Kazakhstan to become non-nuclear weapons states • Technology R&D for CW/BW arms control treaty implementation, monitoring, and verification • Continued inspection, monitoring, and escort support for NBC weapon arms control treaties • Eliminated 84 SLBM launchers, dismantled 255 ICBMs and 37 heavy bombers, and sealed 117 of 194 nuclear weapons test tunnels and bore holes in FSU states • Consolidated funding of R&D programs under DSWA to improve CTBT implementation • Continued development of a global continuous threshold monitoring network and data fusion knowledge base and communications network for CTBT verification

to the Air Force and follow the same path for commercialization during FY 1998. Both detector systems will be available for use by the CTBT IMS.

- ***Securing Nuclear Materials in Russia and States of the Former Soviet Union (FSU).*** Material protection, control, and accounting (MPC&A) cooperation is now under way at over 50 sites across Russia and the FSU states, providing improved security for approximately 650 metric tons of weapons-useable nuclear material (i.e., in the form of metals, oxides, solutions, and scrap). This is enough material to produce over 40,000 nuclear weapons. Cooperation now includes virtually all known sites possessing such materials. The program anticipates completing upgrades at these sites by the end of 2002.

- ***Initiative for Proliferation Prevention with Russia and FSU States.*** The main objectives of this program are to identify and develop nonmilitary applications for defense technologies and create long-term jobs for FSU weapons scientists and engineers. To date, more than 375 projects have been initiated, including over 300 laboratory-to-laboratory projects and over 75 industry cost-sharing projects. About 85% involve institutes in the Russian Federation. While emphasis remains on nuclear technology, the scope of the program includes chemical and biological technologies as well. Because of this program, more than 3,000 former weapons-related technical personnel are now engaged in non-weapons-related projects involving materials science, biotechnology, instrumentation, and medical isotopes.

- ***Strengthening the Nuclear Nonproliferation Regime.*** DOE's efforts have helped to promote adherence to the Nuclear Non-Proliferation Treaty (NPT), increase the effectiveness and efficiency of the International Atomic Energy Agency (IAEA), and promote regional nonproliferation measures. DOE, with support from the National Laboratories, provides equipment, technologies, and expertise to the United Nations Special Commission (UNSCOM) on Iraq and the IAEA that assist in monitoring and performing intrusive inspections in Iraq and North Korea for verifying compliance with the NPT.

Summary of Key U.S. Intelligence Activities

Many of U.S. Intelligence's activities cannot be described in this unclassified setting. The classified Intelligence Annex to this report contains a more thorough discussion of the activities and successes of U.S. Intelligence.

- ***Intelligence Community Support for Counterproliferation.*** In response to the CJCS's *Missions and Functions Study* and the *Counterproliferation CONPLAN 0400*, U.S. Intelligence continues to work closely with the Joint Staff in support of the CINCs. The Defense Intelligence Agency's (DIA) Office for Counterproliferation Support, the Joint Staff's (J-2, Intelligence) executive agent for counterproliferation issues, continues to implement its CJCS-approved *Military Intelligence Action Plan.*

- ***Strategic Planning Process.*** U.S. Intelligence, through its corporate strategic and evaluation planning process, continues to develop new initiatives to support efforts to counter proliferation. This ongoing process contributes to the National Needs Process and the National Foreign

Intelligence Program, the Joint Military Intelligence Program, and the Tactical Intelligence and Related Activities Program and Planning Guidance. A major benefit of this effort has been the placement of a number of DoD personnel within the DCI's Nonproliferation Center. This has helped integrate intelligence support into DoD counterproliferation needs and actions. U.S. Intelligence continues to expand its relations with law enforcement officials to assist in developing initiatives to counter proliferation. The FBI and U.S. Customs Service, for example, have assigned senior agents to the Nonproliferation Center to assist in this endeavor.

- ***Operational Planning Process.*** DIA is linking counterproliferation intelligence production more directly to the CINCs' planning process. DIA is taking guidance from the Joint Strategic Capabilities Plan and direction from the CINCs' J-2s, J-3s (Operations), and J-5s, enabling U.S. Intelligence to more clearly define and satisfy the intelligence requirements necessary to support CINC counterproliferation contingency planning and operations.

- ***Intelligence Successes.*** Some intelligence successes that can be described here include:
  - Support to State Department efforts providing actionable intelligence to UNSCOM's inspection and monitoring activities in Iraq;
  - Continued efforts to provide law enforcement officials with indicators that CW and BW are about to be used;
  - Support to congressional committees, including a report that reviewed and evaluated nonproliferation programs in the National Foreign Intelligence Program FY 1998 budget submission; and
  - Refining a detailed set of information needs, known as, *Nonproliferation: Compendium of Country-Specific Priority Intelligence Needs and Actions,* to guide intelligence collection and analysis.

CPRC Findings and Recommendations

The CPRC finds, as evidenced by the numerous program and activity accomplishments cited in this report, that the seriousness of NBC/M proliferation and NBC terrorist threats, and the need to enhance capabilities to counter them, are recognized throughout DoD (including OSD, the Joint Staff, Services, and CINCs), DOE, and U.S. Intelligence. "Countering proliferation" is now an established and institutionalized priority within each of the CPRC-represented organizations. The development of capabilities to counter NBC terrorist threats is also beginning to receive added attention throughout DoD, DOE, and U.S. Intelligence. These efforts reflect the President's firm commitment to stem NBC/M proliferation and negate terrorist NBC threats. Moreover, as decision makers, policy makers, and warfighters continue to reprioritize their nonproliferation, counterproliferation, and NBC counterterrorism policy and strategy objectives, the CPRC will continue to review related DoD, DOE, and U.S. Intelligence activities and programs to ensure that they continue to meet evolving needs and requirements. The CPRC's recommendations for 1998 are summarized in Figure 1 and discussed below.

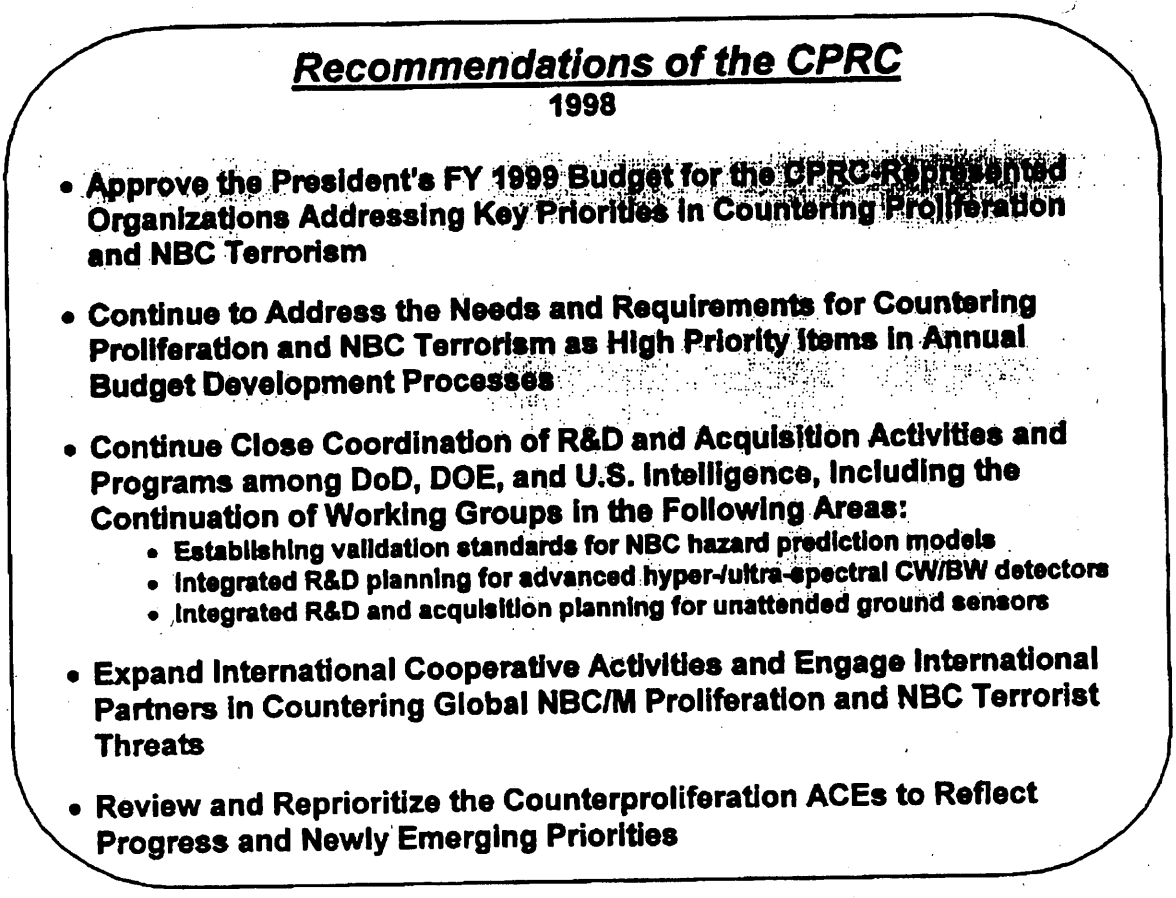

Figure 1. CPRC Recommendations for 1998

The FY 1999 President's budget addresses priority activities and programs for countering NBC/M proliferation and NBC terrorism. *Therefore, the CPRC recommends that the FY 1999 President's budget for each of the CPRC-represented organizations be authorized and appropriated by the Congress.*

Countering proliferation and NBC terrorism are challenges that will have to be addressed for the foreseeable future. Although the activities and programs proposed in the FY 1999 President's budget will continue to produce substantial progress in national capabilities to counter NBC/M proliferation and NBC terrorist threats, areas of capability shortfall will remain. *Therefore, the CPRC directs each represented organization to continue to address nonproliferation, counterproliferation, and NBC couunterterrorism needs and requirements as high priority items in their FY 2000 and out-year budgets.* In light of the CPRC's finding that the need to enhance U.S. national capabilities to counter proliferation is established and institutionalized within the DoD, DOE, and U.S. Intelligence, the CPRC has not identified specific programmatic options for FY 2000. The CPRC expects the normal budget development processes of each CPRC-represented organization to be adequate to ensure a robust, integrated program for countering proliferation and NBC terrorism and satisfy congressional direction to formulate future

programmatic options. However, key areas for progress addressing certain specific aspects of the ACE priorities have been identified for special consideration during budget development activities (see Section 9, Table 9.2).

The CPRC recommends a continuation of the close coordination of counterproliferation-related R&D and acquisition activities and programs among DoD, DOE, and U.S. Intelligence. To this end, the CPRC directs the CPRC Standing Committee to continue to maintain its interorganizational coordination and oversight of R&D and acquisition activities and programs to ensure that the integrated response of DoD, DOE, and U.S. Intelligence in meeting the ACE priorities, which has characterized their cooperation to date, continues.

Last year, the CPRC established Working Groups in three specific areas where improved interorganizational coordination can improve the efficiency, cost-effectiveness, and responsiveness of R&D and acquisition activities. These Working Groups are actively working toward: i) establishing and implementing "validation standards" for NBC weapon effects dispersion and hazard prediction models; ii) developing a user/developer integrated cooperative R&D plan for advanced state-of-the-art active/passive hyper-/ultra-spectral sensors for chemical and biological detection to improve coordination and synergize the efforts of the ongoing R&D activities of the CPRC-represented organizations; and iii) developing a user/developer integrated R&D and acquisition plan for unattended ground sensors to improve cooperation within the developer community and enhance prospects for user acceptance and "buy-in" of this maturing technology. The Working Groups have made progress in pursuing their goals and objectives, including, in particular, improving user involvement in the R&D/acquisition process. *The CPRC recommends that these Working Groups continue their activities, working closely with the Nonproliferation and Arms Control Technology Working Group (NPAC TWG) R&D Focus Groups and other appropriate interagency and departmental entities, until their objectives have been met or until the CPRC is satisfied that their functions can be assumed by the appropriate R&D/acquisition authorities.*

Recognizing the global nature of NBC/M proliferation and NBC terrorist threats, *the CPRC recommends continuing the development of international cooperative efforts to counter these threats by expanding existing cooperative activities in R&D, proliferation prevention, and NBC counterterrorism being conducted by DoD, DOE, and U.S. Intelligence and by working with the policy community to engage international partners to participate in cooperative R&D and acquisiton efforts in the future.* The CPRC's immediate goal is to facilitate a broad interagency discussion among CPRC-represented organizations to encourage the establishment of additional international cooperative R&D efforts (beyond NATO), while expanding existing cooperative efforts, and, eventually, to explore possibilities for establishing joint acquisition programs. The CPRC continues to encourage and endorse cooperation with our international partners through joint activities and programs, including international information-sharing conferences and outreach programs addressing the threats of NBC/M proliferation and NBC terrorism.

The CPRC, through its Standing Committee, will continue to review and update the counterproliferation ACEs, reprioritizing them as required. This process is central to ensure that the ACEs continue to reflect the integration of CINC warfighting required capabilities and the overarching national security policy and strategy objectives they support. Updated and relevant ACEs assist the CPRC in meeting its program review responsibilities, while improving the focus of future programmatic and managerial efforts among the CPRC-represented organizations to counter NBC/M proliferation and NBC terrorist threats.

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1. Introduction and Overview

In this section the purpose, duties, responsibilities, and statutory reporting requirements of the Counterproliferation Program Review Committee (CPRC) are described. Definitions of key terms used in this report are provided, including a definition of the scope of the CPRC's activity and program review responsibilities. The multi-tiered response and operational objectives required to counter the proliferation of nuclear, biological, and chemical (NBC) weapons and their means of delivery, including NBC terrorist threats, are discussed to provide some background and context for the activity and program descriptions that make up the bulk of the report. Finally, the new counterproliferation Areas for Capability Enhancements (ACEs) for 1998, modified since the 1997 CPRC report, are described.

1.1 Description and Purpose of the CPRC

This is the fifth annual report of the CPRC, chartered by Congress to report on the activities and programs of the Department of Defense (DoD) (which includes the Office of the Secretary of Defense (OSD) and the Joint Chiefs of Staff (JCS)), Department of Energy (DOE), and U.S. Intelligence related to enhancing U.S. capabilities to counter the proliferation of NBC weapons of mass destruction (WMD) and their means of delivery (NBC/M).

1.1.1 The Counterproliferation Program Review Committee. Section 1605 of the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 1994 (Public Law No. 103-160, 107 Stat. 1845, November 1993) established the Nonproliferation Program Review Committee (NPRC) and requested the Secretary of Defense to submit a report to Congress concerning nonproliferation activities of Executive Branch agencies. The NPRC issued its findings in a May 1994 Report to Congress entitled *Report on Nonproliferation and Counterproliferation Activities and Programs*. Congress modified the charter of the NPRC in Section 1502 of the FY 1995 NDAA (Public Law No. 103-337, 108 Stat. 2914, October 5, 1994), replacing the NPRC with the CPRC, and focusing its review responsibilities on nonproliferation and counterproliferation activities and programs of DoD, DOE, and U.S. Intelligence. The CPRC is chaired by the Secretary of Defense and composed of the Secretary of Energy (as Vice Chair), the Director of Central Intelligence (DCI), and the Chairman of the Joint Chiefs of Staff (CJCS). The CPRC's membership is indicative of the high level, interdepartmental response necessary to achieve national nonproliferation and counterproliferation policy and strategy objectives to counter the proliferation of NBC/M and NBC terrorism.

In the 1997 NDAA (Section 1309 of Public Law No. 104-210, 110 Stat. 2710, 1996), Congress extended the authority of the CPRC until the year 2000 and designated the Assistant to the Secretary of Defense for Nuclear and Chemical and Biological Defense Programs (ATSD(NCB)) as the Executive Secretary of the CPRC. It also amended the purposes of the CPRC to include ensuring the development and fielding of technologies and capabilities "*to negate paramilitary and terrorist threats involving weapons of mass destruction.*" In addition, the Deputy Secretary of Defense was designated by the Secretary of Defense, in a memorandum dated November 1996, to perform the duties, consistent with the CPRC's charter, of the Chairman of the

CPRC. This action served to equalize the level of representation of CPRC principals among the CPRC-represented organizations, particularly regarding DoD, where the Deputy Secretary chairs DoD's internal Counterproliferation Council (see subsection 5.1.3). The CPRC Standing Committee was also established in November 1996 by the CPRC. The Standing Committee enables the CPRC to be more proactive in fulfilling its responsibilities under the law. It meets regularly and is actively working to perform the duties and implement the recommendations of the CPRC. The Standing Committee is composed of the ATSD(NCB) (as Chair); the Director, Office of Nonproliferation and National Security, DOE (as Vice Chair); the Special Assistant to the DCI for Nonproliferation; the Deputy Director for Strategy and Policy, Joint Chiefs of Staff (Plans and Policy, J-5); and, in recognition of the new statutory role of the CPRC in counterterrorism activities, the Assistant Secretary of Defense for Special Operations/Low-Intensity Conflict (ASD(SO/LIC)).

It should be noted that the Defense Reform Initiative (DRI), currently being implemented within DoD, calls for the elimination of the ATSD(NCB) position. While implementation of the DRI is under way, many aspects of the reorganization remain in development and have yet (at the time of this writing) to be finalized. Nevertheless, the Deputy Secretary of Defense is working to ensure that appropriate DoD officials will continue to support the CPRC and its Standing Committee consistent with the CPRC's congressional charter. Additional details regarding the DRI may be found in subsection 5.1.2.

Duties and Responsibilities. The CPRC is directed by Congress to: i) identify and review existing and proposed capabilities and technologies for supporting U.S. counterproliferation policy and efforts, including efforts to stem the proliferation of NBC/M and negate paramilitary and terrorist NBC threats; ii) prescribe requirements and priorities for the development and deployment of effective capabilities and technologies; iii) identify deficiencies in existing capabilities and technologies; iv) formulate near-term, mid-term, and long-term programmatic options for meeting identified requirements and eliminating deficiencies; v) establish priorities for programs and optimize funding for capability and technology development; vi) identify and eliminate undesirable redundancies or uncoordinated efforts in the development of such technologies and capabilities; vii) encourage and facilitate interagency and interdepartmental funding of programs; viii) ensure integration of DOE programs into the operational needs of DoD and U.S. Intelligence through technology demonstrations and prototype development; and ix) annually assess committee actions and the status of committee recommendations and report their findings to Congress. Excerpts from the 1994, 1995, and 1997 NDAAs establishing and defining the authority and responsibilities of the CPRC are provided in Appendix A.

1.1.2 CPRC Annual Reporting Requirements. Congress directed the Secretary of Defense to submit to Congress, not later than May 1st of each year, a report of the findings of the CPRC. Congress specified that the report contain the following information: i) a complete list, by specific program element, of the existing, planned, or newly proposed capabilities and technologies reviewed by the CPRC; ii) a complete description of the requirements and priorities established by the CPRC; iii) a comprehensive discussion of the near-term, mid-term, and long-term programmatic options formulated by the CPRC for meeting the CPRC's requirements and for eliminating identified deficiencies, including the annual funding requirements and completion dates established for each such option; iv) an explanation of the recommendations made by the

CPRC, together with a full discussion of the actions taken to implement them; v) a discussion and assessment of the status of each CPRC recommendation during the fiscal year preceding the fiscal year in which the report is submitted; vi) identification of each specific DOE program that the Secretary of Energy plans to develop to initial operating capability (IOC) and each such program that the Secretary does not plan to develop to IOC; and vii) for each new technology program scheduled to reach operational capability, a recommendation from the CJCS that represents the views of the Commanders-in-Chief (CINCs) of the unified and specified commands regarding the utility and requirement of the program. This report is in response to that request.

Since 1995 the CPRC has submitted an annual report to Congress on May 1st of each year detailing its findings and recommendations. (The first NPRC report was published in May 1994.) The 1996, 1997, and 1998 (pending) reports are available on the World Wide Web as part of DoD's ACQWeb site at http://www.acq.osd.mil/cp.

1.1.3 Definitions. In this report, "proliferation" refers to the spread of nuclear, biological, and chemical weapons and their means of delivery (denoted "NBC/M") – commonly referred to as weapons of mass destruction (i.e., "WMD"). There is still no universal and consistent use of terms to designate these weapons either within or among the CPRC-represented organizations. In this report the term "NBC/M", defined above, will generally be used because of its greater specificity (compared to the term "WMD") and because it serves to emphasize the important distinctions that exist between nuclear, biological, and chemical weapons and in the corresponding means required to counter them. Nevertheless, the term "WMD" is still used occasionally in the report, particularly when referring to counterproliferation- and counterterrorism-related policy and strategy objectives (where the term is frequently used). It should also be noted that the term "nuclear weapons" is meant to include radiological weapons as well as the more familiar large energy yield nuclear fission/fusion weapons.

1.1.4 Scope of the Report. In addition to countering NBC/M, this report also deals with the technologies and capabilities to defeat the infrastructure elements required to support the production, storage, and deployment of NBC weapons and their delivery systems, in particular ballistic and cruise missiles. Technologies and capabilities to negate paramilitary and terrorist NBC threats are also addressed. The report focuses on existing and emerging proliferant states, but also considers the proliferation of NBC/M from China, certain states of the former Soviet Union (FSU), and Third World nations.

DoD, DOE, and U.S. Intelligence (i.e., the "intelligence community") are responsible for a wide variety of tasks to prevent, deter, and counteract NBC/M proliferation and NBC terrorism. The specific responsibilities of DoD, referred to as "counterproliferation" and "combating terrorism" (which includes "counterterrorism" and "anti-terrorism"), span the spectrum from military operations and warfighting to supporting diplomatic efforts and include: i) supporting proliferation prevention and intelligence activities; ii) implementing and verifying arms control treaties; iii) deterring the use of NBC weapons; iv) defending against NBC/M; v) enabling effective operations in the presence of NBC/M; and, should it become necessary, vi) maintaining a robust capability to find and destroy NBC weapon delivery forces and their supporting infrastructure elements with minimal collateral effects. DoD's roles in combating terrorism include: i) protecting U.S. forces from paramilitary and terrorist threats (generally referred to as

"anti-terrorism"); ii) supporting interagency counterterrorism activities; iii) working with federal, state, and local authorities to support "First Responder" emergency response teams (i.e., those first on the scene); and iv) providing consequence management assistance in incidents involving NBC weapons.

DOE's "nonproliferation" responsibilities include activities and programs in nuclear proliferation prevention, intelligence support, treaty monitoring, countering terrorism, and technology development to support these responsibilities. DOE's extensive expertise in the chemical and biological sciences residing in the National Laboratories is leveraged to improve passive defenses against the use of chemical and biological warfare (CW/BW) agents. In addition to countering CW/BW terrorism, DOE's counterterrorism role includes providing the Nuclear Emergency Search Team (NEST) to respond to acts of nuclear or radiological terrorism. Components of both DoD and DOE provide valuable assistance supporting the lead role of the Federal Bureau of Investigation (FBI) in handling NBC counterterrorism activities in the U.S. The activities and programs of U.S. Intelligence for "countering proliferation" summarized in this report and in the companion "Intelligence Annex" (separately bound), address the broader intelligence efforts necessary to prevent, detect, and react to the proliferation of NBC/M and NBC terrorism.

1.1.5 Scope of Programs Reviewed by the CPRC. The CPRC reviews those DoD, DOE, and U.S. Intelligence programs *strongly related* to countering proliferation and NBC terrorism. In the past, the CPRC defined these programs as those research and development (R&D), acquisition (including procurement), and Operational and Maintenance (O&M) programs that were: i) established and implemented in response to and consistent with NPRC/CPRC recommendations and that, if eliminated, would necessitate significant modification of the CPRC-endorsed initiatives to achieve the recommended improvements in capabilities outlined in previous NPRC/CPRC reports to Congress; and ii) other programs strongly related to countering proliferation and NBC terrorism that directly address the counterproliferation ACE priorities. (See Section 1.3 below.) Beginning with last year's report, the CPRC is including military construction (MILCON) programs that are strongly related to countering proliferation and NBC terrorism and that directly support ACE fulfillment.

In general, existing and ongoing DoD, DOE, and U.S. Intelligence programs strongly related to countering proliferation and NBC terrorism include those R&D, acquisition, and selected O&M and MILCON programs that are directly related to the counterproliferation ACEs and that support the counterproliferation functional areas and the operational objectives for countering NBC/M proliferation and NBC terrorism defined in Section 1.2 below.

It should be noted that general purpose defense and defense infrastructure programs, such as acquisition programs for the various military weapon delivery platforms, are not considered to be strongly related to counterproliferation because they contribute to the basic capabilities of U.S. military forces that underlie all military capabilities, not just those associated with countering NBC/M proliferation and NBC terrorist threats. U.S. nuclear forces are also not included in the CPRC's review because of their fundamental role in ensuring the basic deterrence strategy of the United States, which transcends U.S. counterproliferation policy. Such acquisition programs would still continue largely unaffected should NBC/M proliferation threats suddenly disappear.

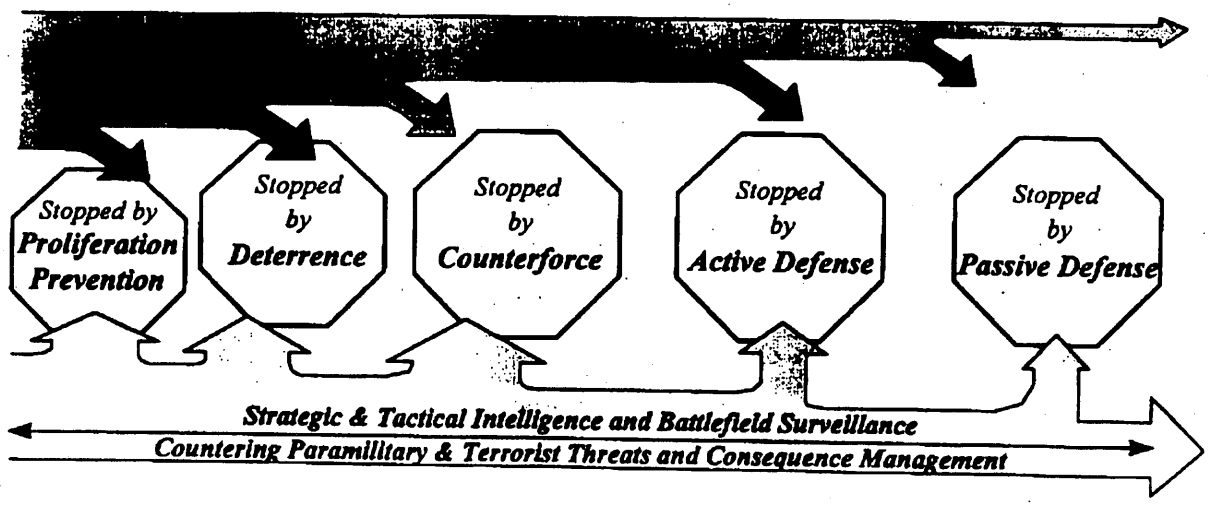


Figure 1.1 Countering Proliferation: A Multi-Tiered Approach

supporting export control activities; assisting in the identification of potential proliferants before they can acquire or expand their NBC/M capabilities; and, if so directed by the National Command Authority, planning and conducting interdiction operations;

- ***Strategic and Tactical Intelligence*** – to provide to policy and operational organizations actionable foreign intelligence on the identity and characterization of activities of existing or emerging proliferant states and groups to support U.S. efforts to prevent the acquisition of NBC/M weapons and technology, cap or roll back existing programs, deter weapons use, and adapt military forces and emergency assets to respond to these threats;

- ***Battlefield Surveillance*** – to detect, identify, and characterize enemy NBC/M forces and associated infrastructure elements (using DoD and intelligence assets) in a timely manner to support combat operations, such as targeting and mission/strike planning activities, and provide timely post-strike battle damage assessment (BDA);

- ***Counterforce*** – to target (using battlefield surveillance and other intelligence assets), plan attacks, deny, interdict or destroy, and rapidly plan and conduct restrikes as necessary against hostile NBC/M forces and their supporting infrastructure elements while minimizing collateral effects;

- ***Active Defense*** – to protect U.S., allied, and coalition forces and noncombatants by intercepting and destroying or neutralizing NBC weapons delivered by ballistic missiles, cruise missiles, multiple launch rocket systems, artillery, and aircraft while minimizing collateral effects that might arise during all phases of intercept;

- ***Passive Defense*** – to protect U.S., allied, and coalition forces against NBC weapons effects associated with NBC/M use, including measures to detect and identify NBC

agents, individual and collective protection equipment for combat use, NBC medical response, vaccines for BW defense, and NBC decontamination technologies; and

- ***Countering Paramilitary, Covert Delivery, and Terrorist NBC Threats*** – to protect military and civilian personnel, facilities, and logistical/mobilization nodes from this special class of NBC threats and manage the consequences of these threats both in the U.S. and abroad.

The activity and program descriptions provided in Sections 5 through 8 of the report are generally organized with respect to these basic functional areas.

1.2.2 Operational Objectives. To meet mission objectives for countering proliferation and ensuring that related interdepartmental R&D and acquisition programs lead to deployed capabilities that satisfy the requirements of the combatant CINCs, key operational objectives have been identified by the CPRC and are listed in Table 1.1 for each counterproliferation functional area. When shortfalls are identified, CPRC-endorsed initiatives will be established to improve

Table 1.1: CPRC-Identified Operational Objectives for Countering Proliferation

Counterproliferation Functional Area	Objectives
• Proliferation Prevention	• Effective and Cooperative Interagency Support in Export Controls, Treaty Verification, and Inspection Support • Detection, Tracking, and Protection of NBC/M-Associated Materials, Components, and Technologies • Effective and Timely Data Correlation and Fusion
• Strategic and Tactical Intelligence	• Accurate, Comprehensive, Timely, and Actionable Foreign Intelligence in Support of National Strategy for Countering Proliferation • Effective/Timely Dissemination of Operational Intelligence to Users
• Battlefield Surveillance	• Accurate NBC/M Target Identification and Characterization • Time-Urgent Response and Situational Awareness Support • Prompt, Reliable Post-Strike Damage Assessment and BDA
• NBC/M Counterforce	• High Kill/Neutralization Probability against Hardened, Underground, and Mobile NBC/M Targets • Collateral Effects Characterization, Minimization, and Neutralization • Time-Urgent Response • Prompt Targeting and Strike/Restrike Planning
• Active Defense	• Cost-Effective, Wide Area, Low Leakage Active Air and Missile Defenses • Collateral Effects Minimization/Neutralization
• Passive Defense	• Prompt, Accurate NBC Agent Detection, Identification, and Early Warning • Individual and Collective Protection, Decontamination, Medical Response, and Post Exposure Therapies that Minimize Casualties, Performance Degradation, and Operational and Logistical Impacts • Availability of Effective BW Vaccines
• Countering Paramilitary, Covert Delivery, and Terrorist NBC Threats	• Joint Interagency Readiness against NBC Threats in the U.S. and Overseas • Prompt, Effective World-Wide Response • Timely and Effective Consequence Management

U.S. capabilities in a timely manner by accelerating the fielding of technologies and capabilities that satisfy the operational requirements of the CINCs and other U.S. government organizations.

1.3 The 1998 Counterproliferation ACEs

Evolution of the Counterproliferation ACEs. The ACEs were first defined by the CPRC in their 1995 report to Congress. They were developed by combining the NPRC's "Areas for Progress" with the Joint Staff and CINC counterproliferation required capabilities established by the Deterrence/Counterproliferation Joint Warfighting Capabilities Assessment (JWCA) team. The ACEs were established to characterize those areas where progress is needed to enhance both the warfighting capabilities of the CINCs and the overall ability to satisfy the demands of U.S. nonproliferation and counterproliferation policy. The May 1996 CPRC report to Congress characterized the ACEs as "defin[ing] those priority areas where additional capabilities are required to meet the challenges posed by WMD proliferation threats. They prioritize the counterproliferation-related responses to interdepartmental policy needs and, in particular, reflect the operational requirements of the Unified Commands for countering proliferation." The ACEs serve a variety of purposes including: "guid[ing] the CPRC's program review process"; providing "a unified basis for reviewing and assessing future progress in meeting counterproliferation and related nonproliferation mission needs" of the CPRC-represented organizations; providing broad guidelines for R&D and acquisition program investments; and defining programs that are "strongly related to countering proliferation," which are those programs that address, or are directly related to, the ACE priorities.

The ACEs are reviewed and reprioritized as necessary on an annual basis to ensure they continue to reflect the integration of CINC required capabilities and the overarching national security objectives they support. The ACEs were extensively modified and reprioritized in 1996 to "improve the focus of future programmatic and managerial efforts to counter the threat of WMD proliferation." The review and reprioritization of the ACEs was completed under the auspices of the CPRC Standing Committee. Each CPRC-represented organization prioritizes the ACEs in accordance with its own departmental missions to more accurately reflect each organization's response to countering proliferation and NBC terrorism. Nevertheless, there continues to be unanimous agreement among the CPRC-represented organizations on the ACE list as a whole.

Summary of the CPRC's ACE Review. The CPRC directed the CPRC Action Officers, under the auspices of the CPRC Standing Committee, to review the ACEs and recommend modifications for CPRC consideration. Represented organizations included each of the Services, the Joint Staff, Office of the Secretary of Defense (ATSD(NCB), ASD(SO/LIC), ASD(Strategy and Threat Reduction), and ASD(Command, Control, Communications and Intelligence)), DoD Agencies, DOE, U.S. Intelligence, the National Security Council (NSC), and the Office of Management and Budget (OMB). The CPRC Standing Committee members and Action Officers participating in the ACE review are listed in Appendix B.

While there were no changes in ACE priorities, one key wording change was made in the ACEs since last year's report to encompass *both* National Missile Defense (NMD) *and* theater missile defense as an ACE priority. In particular, ACE number 4 (DoD priority), "Theater

Ballistic Missile Active Defense," was broadened to read "Ballistic Missile Active Defense." Table 1.2 lists the new counterproliferation ACEs for 1998 and includes the prioritizations of each CPRC-represented organization. The Deterrence/Counterproliferation JWCA team, working with the CINC staffs, plans to complete its review of the CINC Counterproliferation Required Capabilities in October 1998. The CPRC intends to use the results of this review as a point of departure for its next annual review of the ACEs and issue a revised set of ACE priorities in its 1999 report to Congress.

Table 1.2: The 1998 ACEs and ACE Priorities of the CPRC-Represented Organizations

ACE Priorities			Areas for Capability Enhancements (ACEs)
DoD*	DOE	US INTELL	
1	3	1	Detection, Identification, and Characterization of BW Agents
2	6	3	Detection, Characterization, and Defeat of NBC/M Facilities with Minimal Collateral Effects
3	8	4	Detection, Characterization, and Defeat of Underground Facilities with Minimal Collateral Effects
4	-	2	Ballistic Missile Active Defense
5	2	5	Support for Special Operations Forces and Defense Against Paramilitary, Covert Delivery, and Terrorist NBC Threats
6	4	6	Provide Consequence Management
7	-	7	Cruise Missile Defense
8	7	8	Collection, Analysis, and Dissemination of Actionable Intelligence to Counter Proliferation
9	-	13	Robust Passive Defense to Enable Sustained Operations on the NBC Battlefield
10	-	9	BW Vaccine RDT&E and Production to Ensure Stockpile Availability
11	-	14	Target Planning for NBC/M Targets
12	-	11	Prompt Mobile Target Detection and Defeat
13	1	15	Detection, Tracking, and Protection of NBC/M and NBC/M-Related Materials and Components
14	9	12	Support Export Control Activities of the U.S. Government
15	5	10	Support Inspection and Monitoring Activities of Arms Control Agreements and Regimes

* includes both the OSD and JCS

1.4 Organization of the Report

The remainder of the report is organized as follows. Section 2 reviews the findings and recommendations of the CPRC made in last year's report and summarizes the CPRC's approach for reviewing and assessing future progress in activities and programs related to countering proliferation and NBC terrorism. Section 3 provides a considerably updated and expanded overview of worldwide NBC/M proliferation and NBC terrorist threats, and Section 4 summarizes national and departmental policy perspectives and implementation strategies for dealing with these threats. Section 5 provides detailed descriptions of DoD activities and programs that are strongly related to counterproliferation and that directly address the counterproliferation ACEs. Program accomplishments, new initiatives, key milestones, and other new developments achieved since the 1997 CPRC report was issued are highlighted. DOE nonproliferation programs related to countering proliferation, including new initiatives and accomplishments, are discussed in Section 6. U.S. Intelligence programs and activities to counter proliferation are briefly described in Section 7, with the details provided in the separately bound "Intelligence Annex" to this report. The integrated DoD, DOE, and U.S. Intelligence responses to field improved capabilities and technologies to counter NBC paramilitary and terrorist threats are reviewed in Section 8. The findings and recommendations of the CPRC are provided in Section 9, which also summarizes the integrated interdepartmental response for countering NBC/M proliferation and NBC terrorism.

Six appendices are also included in the report: Appendix A provides a chronology of documents establishing the CPRC and excerpts of the congressional statutes that define the scope and responsibilities of the CPRC; Appendix B lists the CPRC program review participants; Appendix C provides tabular summaries of DoD activities and programs strongly related to countering NBC/M proliferation and NBC terrorist threats, including key program accomplishments, milestones, and budget profiles for FY 1999 (President's Budget); Appendix D provides DOE's FY 1999 budget profile for its nonproliferation activities and programs strongly related to countering proliferation; key counterproliferation-related World Wide Web sites are listed in Appendix E; and an acronym list is provided in Appendix F. Finally, a separately bound Intelligence Annex has been prepared by U.S. Intelligence to describe joint U.S. Intelligence, DoD, and DOE intelligence programs related to countering proliferation.

2. Status of the CPRC's 1997 Findings and Its Approach to Assessing Future Progress

This section contains a summary of the status of the implementation of the CPRC's 1997 findings and recommendations, an overview of the progress in addressing the counterproliferation ACEs (in terms of investments by the CPRC-represented organizations), and a brief description of the CPRC's basic approach for assessing future progress in meeting the policy and strategy objectives for countering NBC/M proliferation and NBC terrorism as embodied in the ACEs.

2.1 Implementation of the CPRC's 1997 Findings and Recommendations

The key 1997 CPRC finding was that the seriousness of NBC/M proliferation and NBC terrorism threats and the need to enhance capabilities to counter them were recognized throughout the DoD (including OSD, the Joint Staff, Services, and CINCs), the DOE, and U.S. Intelligence. Citing the many accomplishments documented in last year's report, it was clear to the CPRC that "countering proliferation" was an established and institutionalized priority within each of the CPRC-represented organizations. The CPRC made several recommendations to continue and strengthen the interdepartmental response to countering proliferation, and the progress made to date on implementation is summarized below for each 1997 CPRC recommendation.

Address Counterproliferation-Related Needs and Requirements as High Priority Budget Items. To continue the progress being made in strengthening U.S. capabilities, including initiatives leading to rapid fielding of essential capabilities and improved integration and management oversight of counterproliferation-related activities and programs, the CPRC urged Congress to approve the President's FY 1998 and out-year budgets of DoD, DOE, and U.S. Intelligence related to countering proliferation. Congress approved most of the President's FY 1998 budget request and supplemented it in key areas. The President's FY 1999 budget request is over $6.4 billion in combined DoD and DOE counterproliferation-related activities and programs, approximately an 18% increase over the FY 1998 request. The CPRC-represented organizations continue to treat nonproliferation, counterproliferation, and NBC counterterrorism needs and requirements as high priority items in their budget development processes. (Details of the U.S. Intelligence budget for countering proliferation are provided in the Intelligence Annex to this report.)

Continue Close Coordination of R&D and Acquisition Programs among DoD, DOE, and U.S. Intelligence. Planning, coordination, and other activities related to management oversight expanded significantly in response to CPRC recommendations. The CPRC Standing Committee continues to serve as a proactive vehicle to ensure close cooperation among the CPRC-represented organizations and coordination of their R&D, acquisition, and management activities which have characterized their integrated response in addressing the counterproliferation ACE priorities to date. In addition to the Standing Committee, CPRC Action Officers, representing a variety of organizations within the DoD (including OSD, the Joint Staff, Services, and DoD Agencies), DOE, U.S. Intelligence, NSC, and OMB, meet regularly to address interorganizational issues related to countering NBC/M proliferation and NBC terrorism. Many CPRC Action

Officers also participate in other interagency organizations, including the Nonproliferation and Arms Control Technology Working Group (NPAC TWG), the Technical Support Working Group (TSWG) of the NSC Interagency Working Group on Counterterrorism, and the intelligence community's Intelligence Program Review Group, further enhancing interdepartmental and interagency coordination.

CPRC Action Officers conduct the CPRC Annual Activity and Program Review to assess and disseminate the status of DoD, DOE, and U.S. Intelligence activities and programs strongly related to countering proliferation and NBC terrorism. The purpose of this review is to carry out the CPRC's responsibilities in support of U.S. nonproliferation, counterproliferation, and NBC counterterrorism policy in the areas of: i) ensuring the development and deployment of effective technologies and capabilities; ii) identifying unnecessary redundancies and uncoordinated efforts in development activities; iii) establishing funding priorities for programs; iv) encouraging interagency support and cooperation in fielding enhanced capabilities; and v) ensuring that DOE programs are integrated with the operational needs of DoD, the CINCs, and the intelligence community.

To assist in coordinating R&D and acquisition activities, CPRC Action Officer Working Groups were established in three key areas to: i) establish validation standards for NBC hazard prediction models; ii) develop a user/developer integrated R&D plan for advanced hyper-/ultra-spectral CW/BW detectors; and iii) develop a user/developer integrated R&D and acquisition plan for unattended ground sensors to improve developer coordination and user acceptance. The central focus of these Working Groups is to provide an interdepartmental perspective on the issues to be addressed and to secure early and active user community (i.e., Joint Staff, CINCs, Services, and other "operator" organizations) involvement in the R&D and acquisition process in order to expedite the deployment of enhanced capabilities to the field. A summary of each of the Working Group activities is provided in Section 2.2.

Improve Coordination with the NPAC TWG. The responsibilities of the NPAC TWG complement those of the CPRC. The CPRC has a broader focus, beyond nonproliferation and arms control R&D and technology development. CPRC responsibilities include *both* R&D *and* acquisition activities that directly support enhancements in fielded operational capabilities to counter *all* aspects of NBC/M proliferation and NBC terrorist threats, including the use of military force. The NPAC TWG seeks government-wide coordination and cooperation among technology developers from federal agencies with similar programs. The CPRC and the NPAC TWG are working together to improve and expand cooperation by: i) leveraging NPAC TWG technology Focus Group membership and study results/documentation to support the CPRC Working Groups; and ii) identifying and eliminating undesirable or unnecessary redundancies between the two organizations. The DATSD(NCB)(CP/CBD) serves both as the CPRC Executive Secretariat and NPAC TWG Co-Chair. To ensure close coordination between the two groups, several CPRC Action Officers participate in NPAC TWG Focus Groups, while members from NPAC TWG Focus Groups have been included in CRPC Working Groups. This "de facto" coordination at the Action Officer level works to improve the efficiency of both organizations. Additional information on the NPAC TWG's role in nonproliferation and arms control activities may be found in Section 4.6.

Increase International Cooperative Efforts to Counter Global Proliferation and NBC Terrorist Threats. To expedite and more efficiently and effectively meet the challenges posed by the global proliferation problem, the CPRC continues to encourage and endorse expanded cooperation with international partners in countering NBC/M proliferation and NBC terrorist threats. International cooperative activities raise the awareness of these threats with international partners and demonstrate the U.S. is not alone in its concerns for the defense dimension of countering NBC/M proliferation. Current cooperative efforts are under way by DoD to establish and maintain a dialogue with friends and allies in Europe (e.g., NATO), the Middle East (e.g., Israel, and the Gulf Cooperation Council (GCC) states of Kuwait, Saudi Arabia, Oman, Bahrain, Qatar, and United Arab Emirates), the Asia-Pacific Region (e.g., Republic of Korea, Japan, and Australia), and Eurasia (FSU states). These activities provide a baseline for future foreign military sales and prepare the ground for technical cooperation. NATO is the ripest region for cooperative R&D/acquisition activities. NATO allies, through the Senior Defense Group on Proliferation (DGP), are continuing to enhance interoperability and reorient forces to deal with post-Cold War NBC threats, particularly out-of-area threats. The DGP is the central vehicle for institutionalizing counterproliferation concerns and issues in NATO, defining prioritized capabilities, establishing force structure goals, and conducting armaments planning activities to establish equipment acquisition goals. Standardization Agreements are used to support the cooperative development of enhanced capabilities by creating a policy baseline and the necessary institutional and legal environments where technical cooperation can flourish. DoD and DOE continue to work closely with international organizations, including the International Atomic Energy Agency (IAEA) and the United Nations Special Commission (UNSCOM) on Iraq, to prevent the proliferation of NBC/M.

The CPRC-represented organizations remain committed to building international R&D and acquisition partnerships with allies and friends whose security and national interests are threatened by NBC/M proliferation. The CPRC-represented organizations seek to encourage the establishment of additional international cooperative R&D and acquisition efforts beyond NATO, while expanding existing cooperative efforts. The near-term focus will be on joint R&D activities that have the potential to expand into joint acquisition activities as the international partnerships mature.

Review and Reprioritize the Counterproliferation ACEs. As discussed in Section 1.3, the annual ACE review was completed by the CPRC Action Officers under the auspices of the CPRC Standing Committee. There were no changes in ACE priorities from last year, but National Missile Defense was added to Theater Missile Defense to create a new combined ACE priority for "ballistic missile active defense." Although each CPRC-represented organization prioritizes the ACEs based on their own specific mission needs, there continues to be unanimous agreement on the ACE list as a whole. The CPRC Action Officers began exploring approaches for bringing more rigor and structure to the annual ACE review, including defining "fulfillment criteria" and "metrics" to assist in identifying when an ACE has been fulfilled. This subject is expected to be considered in more detail by the CPRC Action Officers in the coming year.

2.2 Summary of CPRC Working Group Activities and Other Initiatives

The key initiative implemented by the CPRC over the last year was establishing Working Groups in three important technology areas related to countering proliferation: i) establishing validation standards for NBC hazard prediction models; ii) developing an integrated R&D plan for active/passive hyper-/ultra-spectral CW/BW detectors; and; iii) developing an integrated R&D/acquisition plan for unattended ground sensors.

The objectives of the CPRC Working Groups are to enhance the technology developer/user relationship and provide an interdepartmental R&D/acquisition perspective in each of the Working Group subject areas. The basic notion of having technology users (i.e., the Joint Staff, CINCs, Services, and elements of OSD, DOE, and U.S. Intelligence) and developers work closely together early on in the R&D/acquisition process appears to be valid. As evidenced by the success and popularity (with both users and developers) of the ACTD approach to acquisition, early and aggressive user and developer cooperation is serving to expedite the deployment and force integration of new technologies and capabilities to the field. It is also the intent of the CPRC Working Groups to complement and, where possible, leverage related and ongoing activities, such as those of the NPAC TWG Focus Groups. The CPRC Working Groups are using the expertise of the NPAC TWG Focus Group membership and available study results as points of departure for meeting Working Group goals and objectives. Terms of Reference have been established for each of the CPRC Working Groups, laying out goals and objectives, a technical approach, and a near-term schedule. The status of each of the CPRC Working Groups is described in subsections 2.2.1 - 2.2.3.

The CPRC has also taken preliminary steps to develop a future initiative to improve intelligence community support for countering NBC/M proliferation and NBC terrorist threats. These initial efforts are summarized in subsection 2.2.4.

2.2.1 Working Group to Establish Validation Standards for NBC Hazard Prediction Models. The purpose of this Working Group is to establish a process for standardizing and integrating NBC hazard prediction model development and validation efforts among DoD, DOE, and U.S. Intelligence consistent with and supportive of user community needs. It is chaired by the DoD with all CPRC organizations represented. Its scope encompasses all relevant DoD, DOE (including the DOE National Laboratories), and intelligence community developer and user community activities. Key tasks to be undertaken include: i) review interagency model validation, verification, and accreditation procedures; ii) review interagency NBC modeling and simulation requirements, including user community needs and requirements; iii) identify interagency NBC modeling and simulation activities and ongoing efforts; iv) establish a continuing process for coordinating and integrating the development and use of NBC models throughout the user community; v) support the development of standards for model descriptions that assist users in selecting NBC modeling and simulation tools to meet their specific needs; and vi) establish validation standards that capture user community needs and requirements to guide future model development.

This CPRC Working Group is coordinating with the NPAC TWG's Proliferation Modeling Focus Group and a DoD modeling validation working group. This consortium will work to

identify and address specific technical problems with NBC dispersion and hazard prediction models and expand comparative testing of these models to clarify phenomena impacting hazard prediction models, including source term coupling to dispersion characteristics, high resolution meteorological data, atmospheric/water transport, and variations in physiological response.

2.2.2 Working Group to Develop an Integrated R&D Plan for Hyper-/Ultra-spectral CW/BW Detectors. The purpose of this Working Group is to improve the coordination and synergize the efforts of ongoing R&D activities, while involving the user community and assisting them in developing operational requirements, to expedite the fielding of capabilities based on this technology. The Working Group is chaired by the DOE with representation across the full spectrum of CPRC-represented organizations. It intends to leverage existing interagency expertise (e.g., NPAC TWG Focus Groups) and expand participation to include other developer agencies while working to integrate the user community into the R&D planning process. For the near-term, this Working Group has been fully integrated into a Spectral Technology Integrated Product Team (IPT) directed by Congress to develop a cost-effective, interagency R&D plan for hyper-/ultra-spectral sensor systems. The IPT of CPRC-represented organizations was commissioned by the Executive Director for Intelligence Community Affairs and the Deputy Assistant Secretary of Defense for Intelligence and Security. The plan is documented in a February 1998 report to Congress entitled *Spectral Technology Roadmap.* The report: i) identified existing R&D programs focusing on developing spectral remote sensors including those to detect the production, stockpiling, and use of CW/BW agents; ii) documented the organizations involved and the goals, status, and future plans of the identified R&D programs; iii) identified and involved associated user community organizations; and iv) described the future direction for spectral R&D and operational spectral sensing capabilities. Prior efforts to coordinate the R&D activities of the spectral community have resulted in closer collaboration and acceleration of R&D programs. Current emphasis involves transitioning this promising technology to operational use so that it can demonstrate its utility in addressing counterproliferation-related missions.

2.2.3 Working Group to Develop an Integrated R&D/Acquisition Plan for Unattended Ground Sensors. The purpose of this Working Group is to develop an integrated R&D/acquisition plan to improve cooperation within the developer community and enhance prospects for user acceptance and buy-in of maturing unattended ground sensor (UGS) technology. The Working Group will identify customers for UGS technology and develop concepts for assessing and recommending technologies that may be appropriate for various users, including operational DoD users. Its goal is to establish a Memorandum of Agreement among DoD, DOE, and U.S. Intelligence to share development activities and facilitate user involvement. The Working Group is chaired by the intelligence community, with representation from all CPRC-represented organizations. This group identified complementary efforts within the NPAC TWG's UGS Focus Group, addressing specific technical questions associated with UGS technology, and the intelligence community's MASINT (measurement and signature intelligence) Committee's Unattended Sensors Technology Subcommittee, establishing concepts for coordinating R&D efforts. Cooperation and coordination among these groups will improve information exchange among the CPRC-represented organizations, including potential user organizations.

2.2.4 Improved Intelligence Support for Countering Proliferation Threats. At the suggestion of U.S. Intelligence, the CPRC began to explore approaches for improving long-term

(i.e., 10+ years in the future) threat projection and forecasting capabilities by the intelligence community in support of both operational and R&D/acquisition activities related to countering proliferation and NBC terrorism. The CPRC and the intelligence community strongly support strengthening the interagency process to ensure adequate intelligence support to DoD and DOE consumers in defining and characterizing current and future proliferation-related threats. This process should involve an ongoing dialogue among intelligence consumers and intelligence providers to ensure accurate interpretation of intelligence needs by the intelligence community, while instilling a corresponding understanding by intelligence consumers of the strengths and limitations of intelligence collection, analysis, and production. A basic goal is to help intelligence consumers ask better questions of intelligence suppliers.

One key area where enhanced intelligence support is needed, by DoD in particular, is threat characterization in support of R&D and acquisition activities early on in the system acquisition cycle. Given the typical length of the acquisition cycle, long-term threat projections are required. Long-term threat projections are currently defined by the intelligence community in subject-specific Threat Environment Projections (TEPs). The Defense Intelligence Agency (DIA) currently produces a TEP on CW/BW threats, which has been well received by DoD consumers. The TEP vehicle provides a good starting point for expanding long-term intelligence projections for the wide array of threats related to countering proliferation. The CPRC is exploring the possibility of commissioning a study by the Central Intelligence Agency's Integrated Regional Threat Group (IRTG) to assess intelligence capabilities and identify shortcomings in meeting the intelligence forecasting and threat projection needs of the CINCs and the R&D/acquisition community for the counterproliferation and NBC counterterrorism mission areas. The IRTG is a broadly represented "community group" that includes representation from both the intelligence and user communities. It serves as the core of a long-range intelligence forecasting cell, focusing on regional intelligence analysis and production. The IRTG study would lay the foundation for enhanced intelligence community forecasting support and enable initial planning for improving the collection, analysis, and production of actionable intelligence to counter proliferation and NBC terrorism.

2.3 Progress in Addressing the Counterproliferation ACEs

DoD, DOE, and U.S. Intelligence have each made serious commitments to address the threat posed by the proliferation of NBC/M and NBC terrorism. Table 2.1 summarizes the FY 1999 investments planned by DoD and DOE for each ACE priority. U.S. Intelligence's FY 1999 investments are discussed in the Intelligence Annex. The combined DoD/DOE investment for FY 1999 is over $6.4 billion compared to nearly $5.4 billion in FY 1998, approximately an 18% increase. DoD's investment for FY 1999 is over $5.9 billion, which compares favorably with last year's investment of nearly $4.9 billion (i.e., a 20% increase due mainly to increases in active defense related budgets). DoD budgets the bulk of its counterproliferation investment in the areas of air and missile defense (DoD ACE priorities 4 and 7); supporting the inspection and monitoring of arms control agreements (DoD ACE priority 15); maintaining a robust passive defense to enable sustained operations in an NBC contaminated environment (DoD ACE priority 9); detection and characterization of BW agents (DoD ACE priority 1); supporting Special Operations Forces (SOF) and defending against paramilitary, covert delivery,

Table 2.1: Investments in the Counterproliferation ACEs

ACE Priority			Counterproliferation ACEs	Counterproliferation Related Investments for FY 1999 [$M]		
DoD	DOE	US INTELL		DoD	DOE	US INTELL[a]
1	3	1	Detection, Identification, and Characterization of BW Agents	228.3	19.0	
2	6	3	Detection, Characterization, and Defeat of NBC/M Facilities with Minimal Collateral Effects	110.5	-[b]	
3	8	4	Detection, Characterization, and Defeat of Underground Facilities with Minimal Collateral Effects			
4	-	2	Ballistic Missile Active Defense	3,997.4	-	
5	2	5	Support for Special Operations Forces and Defense Against Paramilitary, Covert Delivery, and Terrorist NBC Threats	127.4	48.3	
6	4	6	Provide Consequence Management	120.8		
7	-	7	Cruise Missile Defense	-[c]	-	
8	7	8	Collection, Analysis, and Dissemination of Actionable Intelligence to Counter Proliferation	1.5[a]	-[a]	
9	-	13	Robust Passive Defense to Enable Sustained Operations on the NBC Battlefield	476.1	-	
10	-	9	BW Vaccine RDT&E and Production to Ensure Stockpile Availability	49.1	-	
11	-	14	Target Planning for NBC/M Targets	54.4	-	
12	-	11	Prompt Mobile Target Detection and Defeat	125.3	-	
13	1	15	Detection, Tracking, and Protection of NBC/M and NBC/M-Related Materials and Components	7.3	319.3	
14	9	12	Support Export Control Activities of the U.S. Government	13.2	9.2	
15	5	10	Support Inspection and Monitoring Activities of Arms Control Agreements and Regimes	600.4	119.4	
			• TOTALS:	5,911.7	515.2	

[a] Please see the Intelligence Annex to this report.
[b] Activities included in DOE National Laboratories "Work for Others" programs.
[c] Ballistic missile defense programs also support cruise missile defense capabilities.

and terrorist NBC threats (DoD ACE priority 5); and prompt mobile target detection and defeat (DoD ACE priority 12).

DOE's investment for FY 1999 is $515.2 million, compared to $489.4 million in FY 1998, a 5% increase. DOE's nonproliferation focus results in concentration of its investment in tracking, protecting, and controlling nuclear weapon-related materials and components (DOE ACE priority 1); supporting inspection and monitoring activities of arms control agreements (DOE ACE priority 5); defending against and managing the consequences of covert delivery and terrorist NBC threats (DOE ACE priorities 2 and 4); detection, identification, and characterization of BW agents

through its new Chemical and Biological Nonproliferation Program (DOE ACE priority 3); and supporting export control activities (DOE ACE priority 9).

While the higher priority ACEs generally receive greater investment, the distribution of investments among the ACEs shows some variability. This is due to a variety of factors, including variation in the state-of-the-art and maturity of key enabling technologies, differing development stages of program evolution, unequal opportunities for near-term (versus longer term) payoffs, and the fact that some ACEs simply will require greater investment than others (e.g., those requiring extensive R&D) to reach fruition. Consequently, it is difficult to judge progress in the ACEs simply by looking at the budget numbers. It requires a closer look at the accomplishments and planned milestones of all the programs addressing each of the ACEs – the subject of Sections 5 through 8 of this report.

It must also be noted that several DoD and DOE programs related to countering proliferation respond to multiple ACE priorities. In these cases, budget values listed in Table 2.1 are included under the ACE priority corresponding to the primary thrust of the program. (In the activity and program descriptions provided in Sections 5 through 8 and in Appendices C and D, the ACE priority listed first in the tabular summaries represents the primary thrust of the activity or program.) For example, while programs developing BW detection systems clearly support robust passive defense capabilities (i.e., DoD ACE priority 9), their primary thrust is addressing DoD ACE priority 1. Similarly, several active defense systems under development have some capability to defend against cruise missiles, but, since their primary focus is ballistic missile defense, they are included under DoD ACE priority 4. The ACEs, like the CINCs' counterproliferation required capabilities, primarily focus on theater missile defense where the NBC/M proliferation threat is more immediate and substantial. However, as longer range NBC/M threats proliferate, National Missile Defense takes on added counterproliferation significance. Finally, there is considerable overlap in DoD technologies and capabilities to detect, characterize, and defeat NBC/M and underground facilities, hence contributions in DoD ACE priorities 2 and 3 are difficult to distinguish. The CPRC acknowledges that the investment breakout represented in Table 2.1 is necessarily subjective. Nevertheless, it provides a useful means, in broad terms, to characterize the commitments of DoD, DOE, and U.S. Intelligence in meeting the challenges posed by the counterproliferation ACEs.

2.4 An Approach for Assessing Future Progress

The key objective of the CPRC's interdepartmental coordination process is to ensure that R&D and acquisition activities and programs address national policy and strategy objectives and provide a timely response to meeting the challenges posed by NBC/M proliferation and NBC terrorist threats. This logical sequence is illustrated in Figure 2.1, which also identifies the key ingredients guiding the CPRC's program review process (i.e., national policy and strategy objectives, the CINC's counterproliferation required capabilities, the ACEs, and departmental budgeting activities). The CPRC's program review process seeks to: i) determine if current program requirements are sufficient to meet current and future threats; ii) determine if current programs are adequate to meet requirements; iii) assess current and future capabilities; iv) identify current capability shortfalls and anticipate future shortfalls; v) continue to define and prioritize the

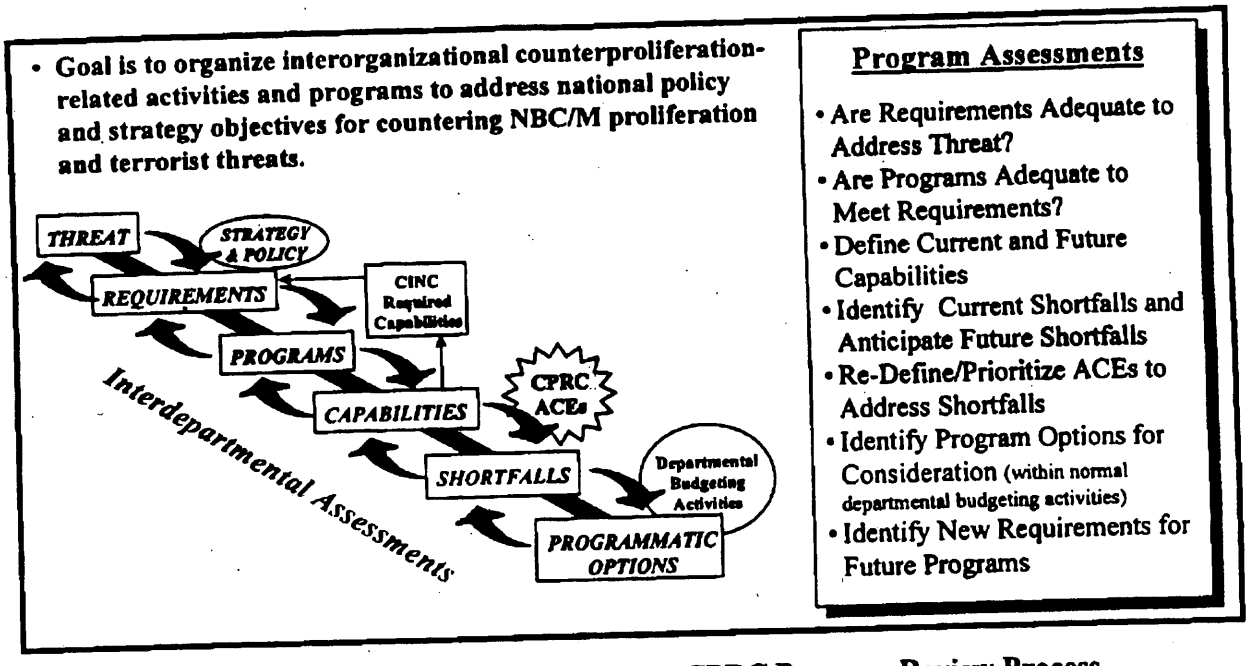
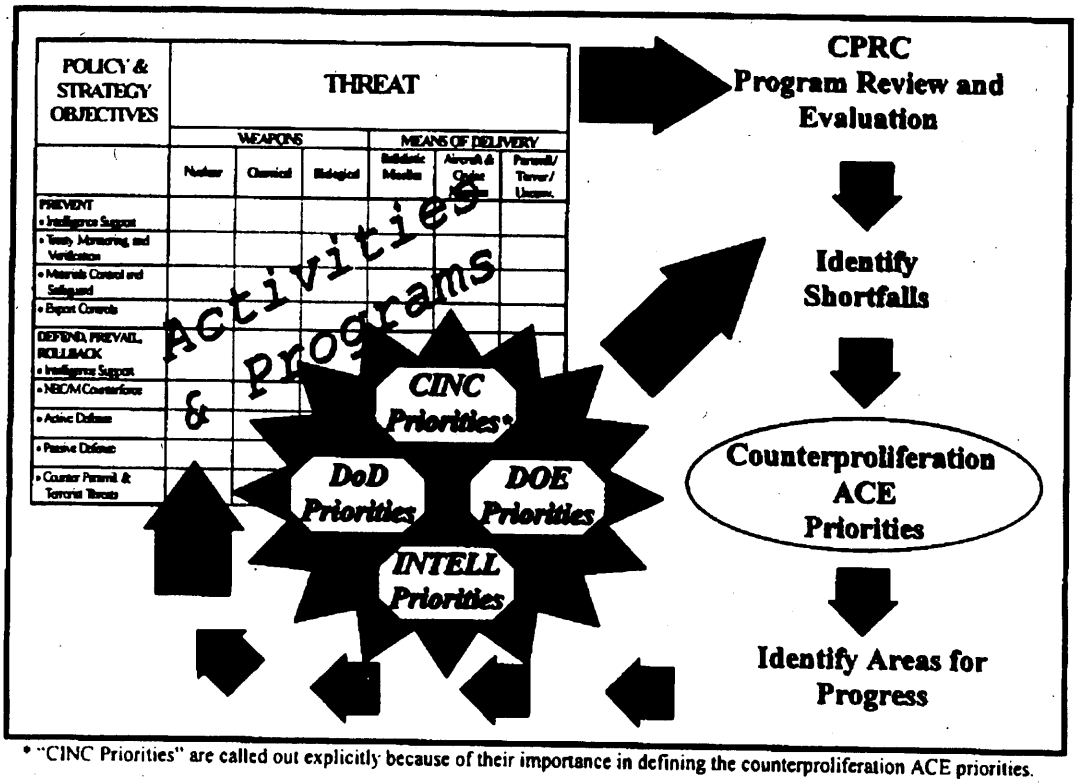


Figure 2.1 Goals and Objectives of the CPRC Program Review Process

ACEs to guide investments in addressing remaining capability shortfalls; vi) identify candidate areas for progress (or program options) for consideration within departmental budgeting activities to address current and near-term capability shortfalls; and vii) assist in identifying new requirements for future programs to address longer-term anticipated shortfalls. The approach is designed to produce a more forward looking and better integrated response to counter NBC/M proliferation and NBC terrorist threats.

The CPRC's annual activity and program review process is designed to ensure that R&D and acquisition activities and programs are tied to key policy and strategy objectives, and that they articulate a clear threat-response linkage. The CPRC ACE priorities are reviewed annually to ensure they continue to reflect those key areas where enhanced capabilities are needed by the CINCs and the operational community to counter NBC/M proliferation and NBC terrorist threats. This structured methodology, illustrated in Figure 2.2, is the mechanism by which the CPRC seeks to fulfill its R&D/acquisition management oversight responsibilities for establishing programmatic priorities, eliminating undesirable redundancies, and optimizing funding to ensure the efficient development and timely deployment of effective technologies and capabilities to the field. In this way, the CPRC seeks to ensure the credibility of the multi-tiered approach to countering proliferation and, in parallel, ensure that each of the key CPRC-identified counterproliferation functional areas and operational objectives, defined in Section 1.2 and embodied in the ACEs, are adequately and prudently addressed.



* "CINC Priorities" are called out explicitly because of their importance in defining the counterproliferation ACE priorities.

Figure 2.2 The CPRC Activity and Program Review Process

3. The Continuing Threat of NBC/M Proliferation and NBC Terrorism

This section is devoted to a description by U.S. Intelligence of NBC/M proliferation and NBC terrorist threats. These threats drive the policy, strategy, and R&D and acquisition program responses discussed in the subsequent sections of this report. Topics discussed in this section include the global scope of the problem, the threat of nuclear diversion, the CW/BW terrorist threat, and the military threat of CW/BW and their means of delivery. A brief review of Iraq's NBC/M programs is also provided. For additional information on proliferation threats, the reader is referred to the November 1997 OSD report entitled *Proliferation: Threat and Response* (available on the Internet at www.defenselink.mil/pubs/prolif97/).

3.1 Introduction: Scope of the Problem

At least 25 countries – some of them hostile to the United States – already have or may be developing nuclear, biological, or chemical weapons, or their missile delivery systems. Others are heavily engaged in the sale or transfer of NBC/M technology. Chemical and/or biological weapons have been used in recent conflicts (e.g., the Iran-Iraq War), and, as the 1995 Tokyo subway incident shows, terrorist attacks using CW agents have become a reality.

The period of stability that accompanied global deterrence during the Cold War is over. Unstable regimes, shifting regional power balances, and terrorism dominate the landscape today. The potential for catastrophic use of NBC weapons maybe greater than it has been in many decades. Intelligence on the potential use of NBC/M is crucial in efforts to control emerging NBC/M crises or avoid imminent disasters.

In the event of a military conflict, U.S. armed forces are being equipped and trained to operate in an NBC environment. The capability to operate effectively in this environment depends heavily on intelligence to identify the specific threats U.S. forces will face at a given location and time. The potential for rapid proliferation of sophisticated CW/BW capabilities makes this problem even more urgent today. To combat the NBC/M threat, U.S. and allied forces must know the characteristics of that threat *very well*. Military intelligence needs are specific and detailed, with a high premium on rapid delivery of analytical products in an operational environment.

In recognition of the serious threat posed by NBC/M proliferation, U.S. Intelligence has developed, and is implementing, a strategic plan that draws on the resources of the entire intelligence community. These intelligence activities are closely coordinated with activities in the policy, defense, and law enforcement communities. In many cases, the activities are joint. The goal is to provide policy makers with the intelligence support they need to: i) prevent the acquisition of NBC/M and related technology and technical insight by countries and terrorist organizations seeking such capabilities; ii) roll back existing programs and capabilities worldwide; iii) deter the use of these weapons; and iv) adapt military forces and emergency assets to respond to the threat posed by these weapons.

Despite some successes for U.S. policy and U.S. Intelligence, technologies related to NBC/M threats continue to be available, and potentially hostile states are still developing and deploying NBC/M-related systems. Efforts to halt proliferation continue to be complicated by the fact that most NBC/M programs are based on technologies and materials that have civil as well as military applications. A growing trend toward indigenous production of NBC/M-related equipment is decreasing the effectiveness of sanctions and other national and multinational tools designed to counter proliferation.

The intelligence community takes an active role in supporting U.S. government initiatives to strengthen export controls in supplier countries and to work with other countries to prevent the sale of NBC/M, advanced conventional weapons, and their related technologies. While it is an extremely difficult problem, U.S. government efforts have made some progress, making both the acquisition and development of NBC/M more difficult and costly for proliferators.

Proliferation Prevention Interdiction Activities. Interdiction of NBC/M and the technologies necessary to acquire an NBC/M capability is a component in the proliferation prevention effort. Interdiction efforts are viewed as falling into three basic categories: i) preventing the transfer of materials through export controls and international nonproliferation regimes; ii) halting the transfer or the negotiation of transfer of materials through diplomatic and liaison initiatives; and iii) seizing proscribed materials in transit through law enforcement agencies in cooperation with the intelligence community. Interdiction efforts are an important part of overall nonproliferation strategy. By themselves they generally do not get countries out of the business of proliferation. They do, however, buy time for other initiatives that may be more successful in halting or rolling back an NBC/M program. U.S. export license applications of concern are scrutinized by a number of agencies, including the intelligence community. The U.S. is developing procedures to share appropriate end user information with key allies in an effort to strengthen mutual export control activities. Procedures for alerting other governments of impending transfers and tracking resulting actions are in place and working. Interdictions of shipments are occurring.

Interdiction successes rest, in large measure, not on the quantity of information available to the policymaker, but on the quality. In licensing, for example, policymakers need unambiguous intelligence information before making a decision to deny a license, thereby denying a sale for the U.S. company. Demarches to other governments must be accurate or the U.S. will be accused of crying wolf and lose support from even friendly countries. Interdictions of shipments in transit often become international incidents, and a potential embarrassment if the targeted material is not found in the shipment.

Actionable intelligence in support of interdiction efforts requires more than cooperation among U.S. intelligence, policy, and law enforcement agencies. It demands close working relationships between the U.S. and other foreign governments committed to halting the proliferation of NBC/M. Such relationships include intelligence sharing arrangements, but equally important are diplomatic, military, and scientific exchanges at all levels.

Proliferation Prevention Challenges. As noted above, interdiction programs by themselves cannot halt the proliferation of NBC/M. Alternative suppliers and technologies,

increasing use of denial and deception, and a growing ability for indigenous production of NBC/M or their component parts are opening new avenues to states or organizations determined to obtain an NBC/M capability. The increasing diffusion of modern technology through the growth of the world market is making it more difficult to detect illicit diversions of materials and technologies relevant to a weapons program. U.S. Intelligence is addressing these new challenges with more aggressive efforts that go beyond traditional cold war efforts aimed merely at understanding weapons and associated plans. U.S. Intelligence is improving the way it integrates technical analysis with political, military, and diplomatic analysis to provide policymakers with better information on the motivations that drive foreign actions and decisions and on influential opposition forces that could support initiatives to diminish or eliminate the proliferation threat.

Proliferation prevention efforts are further complicated by the fact that most NBC/M programs are based on dual-use technologies and materials that have legitimate civilian or military applications unrelated to NBC/M. For example, chemicals used to make nerve agents are also used to make plastics and to process foodstuffs.

Nonproliferation regimes provide international standards to gauge and address behavior. They provide diplomatic tools to isolate and punish violators. In the past few years, many states have joined these regimes and outsiders are encountering new pressures to join. Procurement costs for NBC/M weapons are rising as the need for convoluted efforts to hide purchases increases. The sheer volume of international commerce, increased self-sufficiency, and the global diffusion of technology and its dual-use nature make the regimes' road ahead a difficult one. Intelligence will play an increasingly important role in maintaining the effectiveness of nonproliferation regimes.

Chinese and Russian assistance to proliferant countries requires particular attention, despite signs of progress. China's defense industries are under increasing pressure to become profit making organizations – an imperative that can put them at odds with U.S. interests in counterproliferation. Conventional arms sales have lagged in recent years, encouraging Chinese defense industries to look to NBC/M technology-related sales, primarily to Pakistan and Iran. Russia's export controls specifically regulate the transfer of missile-related technologies and components. But the system has not worked well, and proliferant countries have taken advantage of its shortcomings. Iran's success in gaining technology and materials from Russian companies, combined with recent indigenous Iranian advances, means that it could have a medium range missile much sooner than previously anticipated. China and Russia have been primary sources for proliferated missile-related technologies.

Iran continues to be one of the most active countries seeking to acquire all types of NBC/M technology and advanced conventional weapons. Its efforts are focused on acquiring production technology that will give Iran an indigenous production capability for all types of NBC/M. Iran obtained the bulk of its CW equipment from China and India and sought dual-use biotechnology equipment from Europe and Asia, ostensibly for civilian uses. Numerous interdiction efforts by the U.S. government have interfered with Iranian attempts to purchase arms and NBC/M-related goods, but Iran's acquisition efforts remain unrelenting. Table 3.1 provides a brief overview of Iran's NBC/M programs.

Table 3.1: Iran's NBC/M Programs

Nuclear	• Attempting to acquire fissile material for weapons development. • Chinese and Russian supply policies are key to Iran's success; Russia has agreed to build power reactor. • Ratified the Nuclear Non-Proliferation Treaty and signed the Comprehensive Test Ban Treaty.
Chemical	• Employed chemical agents on limited scale during Iran-Iraq war. • Produces chemical agents and is capable of use on limited scale. • Seeking future independent production capability; Chinese assistance will be critical to Iran's success. • Ratified the Chemical Weapons Convention.
Biological	• Possesses expertise and infrastructure to support biological warfare program. • May have small quantities of agent available; seeking larger capability. • Ratified the Biological and Toxic Weapons Convention.
Ballistic Missiles	• Maintains and is capable of using SCUD B/Cs and CSS-8s. • Produces SCUDs with North Korean help. • Seeks to produce longer range missiles (1,000 kilometers or more). • Not a member of the Missile Technology Control Regime.

Countries determined to maintain NBC/M programs over the long term have been placing significant emphasis on securing their programs against interdiction and disruption. In response to broader, more effective export controls, these countries have been trying to reduce their dependence on imports by developing an indigenous production capability. Many Third World countries, with Iran being the most prominent example, are responding to Western proliferation prevention efforts by relying more on legitimate commercial firms as procurement fronts and by developing more convoluted procurement networks. Should countries such as Iran ever become self-sufficient producers and exporters of NBC/M-related goods and conventional weapons, however, opportunities to prevent acquisition by other would-be proliferators will be dramatically limited.

3.2 The Threat of Nuclear Diversion

Although the threat of a massive nuclear attack involving hundreds or even thousands of nuclear weapons from the FSU has diminished, other threats have arisen: the potential acquisition of nuclear materials or even nuclear weapons by states hostile to the U.S. or by terrorists intent on staging incidents harmful to U.S. interests. The chilling reality is that nuclear materials, technologies, and expertise are more accessible now than at any other time in history – due in part to the dissolution of the Soviet Union and the region's worsened economic conditions and political instabilities. This problem is exacerbated by the increasing diffusion of modern technology through the growth of the world market, making it harder to detect illicit diversions of materials and technologies relevant to a nuclear weapons program.

U.S. Intelligence is taking all possible measures to support U.S. government efforts to ensure the security of nuclear materials and technologies. Nevertheless, there are several reasons why the U.S. is concerned about the security of nuclear materials.

- Russia and the other states of the FSU are not the only potential sources of nuclear weapons or materials.

- A few countries whose interests are inimical to the U.S. are attempting to acquire nuclear weapons – Iraq and Iran have been two of the greatest concerns. Should one of these countries, or a terrorist group, acquire one or more nuclear weapons, they could threaten or attack deployed U.S. or allied forces, or even threaten to conduct an attack against the U.S. itself.

- The effort required to become a nuclear power is being reduced. Years ago there were two impediments to would-be proliferators: the technical know-how for building a bomb and the acquisition of the fissile material. While it is by no means easy to make a nuclear weapon, knowledge of weapons design is sufficiently widespread so that a concerted effort could succeed in at least developing a workable, albeit crude, design. The single greatest impediment to a nation acquiring a nuclear capability is the acquisition of fissile material. Nuclear weapons require fissile material in the form of highly enriched uranium or plutonium, both of which require large multi-billion dollar development programs to produce independently. Today, fissile material is more susceptible than ever to being purchased, stolen, or otherwise acquired.

The protection of fissile material in the FSU has thus become more critical at the same time that it has become more difficult. Many of the institutional mechanisms that once curtailed the spread of nuclear materials, technology, and knowledge no longer exist or are present only in a weakened capacity. Effective new methods of control have yet to be fully implemented for a large portion of the world's nuclear-related materials, technology, and information.

The list of potential proliferators is not limited to states with nuclear weapons ambitions. There are many non-state actors, such as separatists and terrorist groups, criminal organizations, and individual thieves who could choose to further their cause by using fissile or non-fissile (but radioactive) nuclear materials. Despite press articles claiming numerous instances of nuclear trafficking worldwide, U.S. Intelligence has no indications that any fissile materials have been acquired by terrorist organizations. However, press reports have indicated possible terrorist interest in acquiring fissile materials. There are no indications of state-sponsored attempts to arm terrorist organizations with nuclear material, fissile or non-fissile. Furthermore, conventional weapons such as improvised explosives remain the most likely option for terrorist groups because they are much easier to use and can be effective as tools of terror. Even chemical or biological agents are less expensive and easier to acquire than nuclear materials. Unfortunately, this does not preclude the possibility that a terrorist group could acquire enough nuclear material, potentially through illicit trades, to conduct an operation, especially one specifically designed to incite panic.

A non-state actor does not necessarily need fissile material for its purposes. Depending on the group's objectives, any radioactive material could suffice, but the use of non-fissile materials would likely result in low levels of contamination with very little physical damage. But non-fissile radioactive materials dispersed by a conventional explosive or even released accidentally could cause damage to property and the environment and cause social, political, and economic disruption. Examples of non-fissionable, radioactive materials seen in press reports are cesium-

137, strontium-90, and cobalt-60. These cannot be used in nuclear weapons but could be used to contaminate water supplies, business centers, government facilities, or transportation networks. Although it is unlikely they would cause significant numbers of casualties, they could cause physical disruption, interruption of economic activity, and psychological trauma to the work force and general populace and require some measure of post-incident clean-up. Non-state actors already have attempted to use radioactive materials in recent operations (e.g., Chechen insurgents threatening Moscow with radioactive waste).

Traditional terrorist groups with established sponsors probably will remain hesitant to use a nuclear weapon for fear of provoking a worldwide crackdown and alienating their supporters. In contrast, a new breed of transnational terrorists, exemplified by the Islamic extremists involved in the bombing of the World Trade Center in 1993, might be more likely to consider such a weapon if it were available. These groups are part of a loose association of politically committed, mixed-nationality extremists, apparently motivated by revenge, political grievances, religion, or a general hatred for the West.

3.3 The Terrorist Threat of Chemical and Biological Weapons

The danger that a terrorist organization like the Japanese cult Aum Shinrikyo could acquire the capability to launch an attack using CW/BW continues to exist. U.S. Intelligence continues to assess and analyze the threat of a terrorist CW/BW attack. The Aum Shinrikyo attacks in June 1994, in Matsumoto, Japan, which killed seven and injured 500, and on the Tokyo subway in March 1995, which killed 12 and injured 5,500, were the first instances of large-scale terrorist use of CW agents, but a variety of incidents and reports over the last three years indicate continuing terrorist interest in these weapons.

Terrorist interest in CW/BW is not surprising, given the relative ease with which some of these weapons can be produced in simple laboratories, the large number of casualties they can cause, and the residual disruption of infrastructure they can precipitate. Although popular fiction and national attention have focused on terrorist use of nuclear weapons, CW/BW are more likely choices for such groups.

- In contrast to the fabrication of nuclear weapons, the production of BW requires only a small quantity of equipment.

- A knowledgeable and capable terrorist organization could theoretically employ BW/CW on a large scale as a "weapon of mass destruction," possibly causing thousands of casualties. Even very small amounts of BW/CW can cause massive casualties. The fact that only 12 Japanese died in the Tokyo subway attack has tended to mask the significance of the 5,500 people who were treated or examined at medical facilities. Such a massive influx of injured – many critically – has the potential to overwhelm emergency medical facilities, even in a large metropolitan area.

- Terrorist use of these weapons also makes them "weapons of mass disruption" because of the necessity to decontaminate affected areas before the public will be able to begin

feeling safe again. Inefficient dissemination of CW/BW, or even a hoax incident, could still result in substantial psychological impact in the target audience.

Although the Aum Shinrikyo case demonstrates that terrorists can produce CW, they also may be able to directly acquire these weapons via other means, including theft of agents from research labs, acquisition of commercially available poisons, theft of CW munitions held by the military, black market activity, and receipt of ready-made CW agents or munitions from a state sponsor. It is unlikely that all such acquisition attempts will be discovered and investigated. Detection of the acquisition of BW is especially troublesome. There is no doubt that the use of BW could be devastating, possibly causing thousands of deaths and, at the very least, seriously disrupting the daily lives and business activities of Americans and U.S. allies. Several states, including Libya and Syria, remain on the State Department's terrorist list highlighting the danger of potential state sponsorship of a terrorist's CW/BW program, although there is no evidence of state sponsors providing CW/BW or the technologies to produce them to terrorist groups.

3.4 The Military Threat of Chemical and Biological Weapons

The military threat from CW/BW is greater today than it has ever been – particularly in regions where religious, ethnic, and/or economic strife are feeding the roots of conflict. Exacerbating the problem is the worldwide proliferation of knowledge and technology related to CW/BW agent production and weaponization. Ready access to international computer networks and databases provides a would-be proliferant with unparalleled access to information that can greatly accelerate the development of a CW/BW weaponization program (i.e., turning a stockpile of CW/BW agents into a militarily significant weapon). Not only must U.S. forces be prepared for these threats; they must be prepared now.

The costs of nuclear weapons, the requirement for large supporting infrastructures, and the need to acquire the many different technologies necessary for weaponization are limiting factors in achieving a nuclear weapons capability. On the other hand, initiating a CW agent production capability is a rather straightforward adaptation of basic industrial chemical processes. Similarly, BW agents can be produced by countries possessing a pharmaceutical, veterinary, or medical infrastructure. For such countries, CW/BW production is technically feasible and can become a reality with the acquisition of some specialized equipment, cooperation of appropriate scientists and engineers, and the political will to do so. The military effectiveness of CW/BW weaponization will depend on the overall support available from the country's military infrastructure and the training and doctrine development it can provide. However, with only modest investments a credible and effective CW/BW weaponization program can be established.

Aimed at certain critical nodes in the military infrastructure of the U.S., either domestically or abroad, CW/BW could seriously disrupt the execution and tempo of military operations. Contamination of mobilization/logistics nodes, ports, and other choke points created during force projection (e.g., the ports at Al Jubyal and Ad Dammam during the Gulf War) could delay the initiation of military campaigns, increase the exposure and vulnerability of troops, and threaten the very success of military operations. It is imperative, therefore, that U.S. forces be prepared to

operate effectively in CW/BW contaminated environments while simultaneously being able to detect and identify threat agents, treat casualties, and remediate contaminated areas.

The Soviet Union may have had the most advanced CW/BW programs in the world; at the very least, it certainly had the largest. Moscow has declared the world's largest stockpile of CW agents: 40,000 metric tons of chemical agent, mostly weaponized, including artillery, aerial bombs, rockets, and missile warheads. Key components of the former Soviet offensive BW program remain largely intact and may support a possible future mobilization capability for the production of agents and delivery systems. Moreover, work outside the scope of legitimate defense activity may be occurring now at selected facilities within Russia. The collapse of the Soviet Union and the current economic and unemployment problems of the states of the FSU may have a significant impact in the coming years on the direction and pace of CW/BW development throughout the world. While not sanctioned by the standing governments of FSU states, individuals and organizations may be tempted to sell related knowledge and materiel for hard currency just to survive. Certainly, the scientists and engineers formerly employed in the Soviet CW/BW weapons complex could be vulnerable to this temptation. Just as the level of protection and control of nuclear materials has declined since the fall of the Soviet Union, so too could CW/BW knowledge and materials become vulnerable to pilfering by entrepreneurs looking to turn a quick profit in the international proliferation marketplace.

Press reports indicate that the Soviet Union may also have developed CW agents that are harder to detect, protect against, and treat than standard nerve and other conventional CW agents. Russian officials do not deny research has continued but assert that it is for the purpose of developing defenses against CW, a purpose that is not banned by the Chemical Weapons Convention (CWC). Many of the components for new binary agents developed by the FSU are not on the CWC schedules of chemicals and have legitimate civil applications, clouding their association with CW development. Proliferation of knowledge and material associated with these CW agents to regions of instability or by rogue nations could severely impact U.S. national interests, national policy, and military strategy. The prospect of facing a country, such as Iraq, equipped not just with CW, but with CW for which we do not possess adequate means of protection or detection, is a sobering thought.

Another, less well understood, CW threat is the potential for a Bhopal-like industrial contamination event resulting from deliberate targeting of industrial facilities in populated areas. U.S. forces operating in industrial areas could face a combined threat of conventional CW agents and exposure to industrial chemicals released either deliberately by saboteurs or as a result of collateral effects associated with military attack operations (i.e., by friend or foe).

Ballistic Missile NBC Weapon Delivery Systems. Ballistic missiles offer potential proliferators several advantages in delivering NBC weapons. This is evidenced by the fact that many of the states thought to possess or seeking to possess NBC weapons also have programs to develop or acquire ballistic missiles. Ballistic missiles are less expensive to acquire and sustain than a modern air force. They have a relatively low profile infrastructure, and the use of mobile launchers makes them far less vulnerable to U.S. offensive operations than, for example, manned aircraft with ties to fixed air bases. The U.S. experience in the Gulf War demonstrated the

exceptional challenge posed by mobile ballistic missile launchers to counterforce operations. Perhaps the greatest attraction of ballistic missiles is the difficulty in defending against them.

The potential for coercion is, perhaps, the long-range ballistic missile's greatest value to proliferators and the greatest challenge for those seeking to restrain them. Beyond their coercive value in threatening distant cities and their ability to distract and tie up military resources seeking to counter them, ballistic missiles – if sufficiently accurate and/or lethal – can pose a direct military threat as well. During the Gulf War, 25 percent of U.S. combat fatalities resulted from a single SCUD missile strike on a makeshift barracks in Dhahran, Saudi Arabia. Whether as a terror weapon against civilian populations or as a means to threaten the rear of U.S. and coalition forces, ballistic missiles can be an effective offensive weapon, even in the midst of U.S. air superiority. This is particularly the case with NBC-armed ballistic missiles. Because of their ability to spread lethal effects over wide areas, arming ballistic missiles with NBC weapons can, to some extent, compensate for a lack of missile accuracy. An inaccurate ballistic missile armed with conventional high explosives can be transformed from a militarily ineffective terror weapon to a militarily significant weapon by adding an NBC warhead. Hence, those who seek to develop or acquire NBC weapons will likely seek to develop or acquire ballistic missiles as well, and sometimes, unfortunately, vice versa.

Cruise Missile NBC Weapon Delivery Systems. Article 2 of the Intermediate Range Nuclear Forces (INF) Treaty provides a useful definition: "A cruise missile is an unmanned, self-propelled vehicle that sustains flight through the use of aerodynamic lift over most of its flight." Cruise missiles may be even less expensive and more accurate than ballistic missiles, and their smaller size may make them an even more elusive target for counterforce operations. Furthermore, they may also be more difficult to defend against than manned aircraft because of their lower radar cross-section and flight characteristics. Cruise missiles tend to be small, easy to hide, capable of being launched from a variety of mobile launch platforms (air, ground, and sea based) without significant modifications to the missile, relatively hard to detect in flight, and potentially accurate to a few tens of meters (e.g., via the Global Positioning System). Even unsophisticated general aviation aircraft and commercially available remotely piloted vehicles could be turned into an unmanned cruise missile of sorts and configured to accomplish a variety of militarily significant missions. Such aircraft are widely available and inexpensive to purchase, support, and operate. Even though short-range anti-ship cruise missiles are already widely available, there are only a few countries that possess long-range, land-attack cruise missiles. However, there are no technological barriers preventing even developing nations from developing or purchasing these relatively inexpensive, potentially very accurate NBC weapon delivery systems. Although they can be designed to deliver their payloads to great distances (both the U.S. and the FSU built cruise missiles with range capabilities of more than 3,000 km), the majority of currently available cruise-type missiles have ranges typically less than about 500 km.

Underground and Hardened NBC/M Facilities. Some countries are concealing NBC/M facilities and protecting them from attack by constructing underground and other hardened facilities. Placing an NBC/M capability – a weapon, a delivery system, or an NBC weapon production complex – within an underground facility enhances a country's ability to conceal the facility's location, in addition to providing considerable protection against attack. Protection in such facilities may involve layers of concrete and steel roofs with earth cover. Other options

include the use of tunnels, including existing coal and salt mine complexes, and natural caves that can be both deep and extensive. Within a hardened complex such measures as blast doors, barriers, turns in tunnels, and expansion chambers can channel and deflect blast waves to mitigate their destructive effects. Modern excavating equipment has speeded the process of constructing such facilities while also reducing construction costs. The Iraqi shallow buried and hardened facilities attacked during the Gulf War were for the most part remnants of an earlier generation of protective facilities construction. Because of the success achieved by U.S. weapons against these facilities, a new trend has been observed: the increased use of deep underground structures, such as abandoned mines or tunnels, to protect high value military assets. A proliferant state's NBC/M forces and supporting infrastructure elements are one such high value military asset. Libya's construction of the Tarhunah tunnel complex, a suspected large scale CW production facility, is an example of this trend reported in the press. This complex is illustrated in Figure 3.1.

Figure 3.1 The Tarhunah Underground CW Production Complex

3.5 Iraq: A Closer Look

This section examines the magnitude of Iraq's NBC/M programs and underscores the complexity faced by international efforts to curb the spread of these weapons. Details about the breadth of Iraq's past CW/BW programs are presented to demonstrate the broad range of weapons that a state sponsor of terrorism has available and could provide to terrorists if it so chooses.

The unprecedented inspections conducted in Iraq by the United Nations (UN) have revealed much about Iraqi NBC/M programs. In the wake of the August 1995 defection of Saddam Hussein's son-in-law, Husayn Kamil, the Baghdad government turned over to UNSCOM and the IAEA a large cache of NBC/M-related documents and revealed even more information in extensive discussions with both UN organizations. Despite severe war damage and over six years of UN inspections, Iraq retains the technological expertise to quickly resurrect its NBC/M program if UN inspections were ended. Iraq continues to hide critical NBC/M production equipment and material from UN inspectors.

Iraq's Biological Warfare Program. No concrete information on the scope of Iraq's BW program was available until August 1995, when Iraq disclosed, after the defection of Husayn Kamil, the existence of an offensive BW capability. Iraqi officials admitted that they had produced anthrax (8,500 liters), botulinum toxin (19,000 liters), and aflatoxin (2,200 liters) after years of claiming that they had conducted only defensive research. Baghdad also admitted preparing BW-filled munitions – including 25 SCUD missile warheads, aerial bombs, and aerial dispensers – during the Gulf War, although it did not use them. Iraq acknowledged researching the use of 155mm artillery shells, artillery rockets, a MiG-21 drone, and aerosol generators to deliver BW agents. UNSCOM has destroyed a range of BW production equipment, seed stocks, and growth media claimed by Iraq for use in its BW programs. UNSCOM believes Iraq has greatly understated its production of BW agents and could be holding back such agents, which are easily concealed.

Iraq resisted dismantling the Al Hakam BW production facility for nearly one year after disclosing in 1995 that it manufactured more than 500,000 liters of BW agents at the facility between 1989 and 1990. When UNSCOM finally pressed Iraq to destroy Al Hakam in the summer of 1996, Baghdad claimed that Al Hakam was a legitimate civilian facility designed to produce single-cell proteins and biopesticides. Al Hakam's remote location (55 km southwest of Baghdad) and the security involved in its construction suggest that Al Hakam was intended to be a BW production facility from the outset.

Baghdad has provided no hard evidence to support claims that it destroyed all of its BW agents and munitions in 1991. UNSCOM Chairman Richard Butler stated that Iraq's most recent BW declaration, submitted in September 1997, "failed to give a remotely credible account of Iraq's biological weapons program." In late 1995, Iraq acknowledged weapons testing using the BW agent ricin, but did not provide details on the amount produced. Two years later, UNSCOM discovered documents that showed Iraq had produced the BW agent ricin. Iraq has the expertise to quickly resume a small-scale BW program at known facilities that currently produce legitimate items such as vaccines and other pharmaceuticals. Without effective UN monitoring, Baghdad could probably begin production within a few days. For example, Iraq can convert production of

biopesticides to anthrax simply by changing seed material. Figure 3.2 provides a historical summary of Iraq's BW development program.

Iraq's Chemical Warfare Program. Iraq had an advanced CW capability that it used extensively against Iran and against its own Kurdish population during the 1980s as summarized in Table 3.2. Iraqi forces delivered CW agents (including mustard gas and the nerve agents sarin and tabun) in aerial bombs, aerial spray dispensers, 120mm rockets, and several types of artillery shells both for tactical military purposes and to terrorize rebellious segments of the population. Iraq maintained large stockpiles of CW munitions and had a major production capacity. UNSCOM supervised the destruction of more than 40,000 CW munitions (28,000 filled and 12,000 empty), 480,000 liters of CW agents, 1,800,000 liters of chemical precursors, and eight different types of delivery systems – including ballistic missile warheads – in the past six years. Following Husayn Kamil's defection, Iraq disclosed that it: i) produced larger amounts of the nerve agent VX than it previously admitted; ii) acknowledged, despite previous claims it only conducted research, that it had conducted pilot production of about four tons of VX from 1988 to 1990; iii) researched in-flight mixing of binary CW weapons before the Gulf War – an advance in the development of a CW capability that extends the shelf life of chemical agents; and iv) perfected techniques for the large-scale production of a VX precursor that is well suited to long-term storage.

UNSCOM believes Iraq continues to conceal a small stockpile of CW agents, munitions, and production equipment. Baghdad has not supplied adequate evidence to support its claims that it destroyed all of its CW agents and munitions. The destruction of as much as 200 metric tons of chemical precursors, 70 SCUD warheads, and tens of thousands of smaller unfilled munitions has not been verified. Baghdad retains the expertise to quickly resume CW production. In the absence

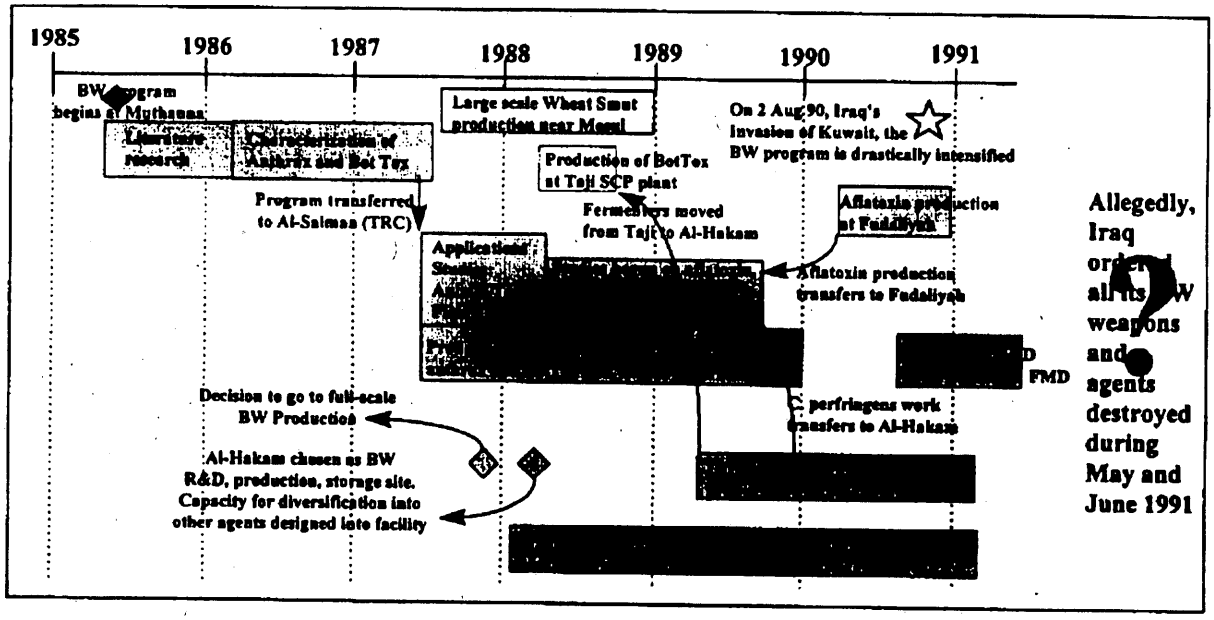


Figure 3.2 Declared History of Iraq's BW Program

Table 3.2: Iraqi Use of Chemical Weapons

Date	Area Where Used	Type CW Agent Used	Approximate Casualties	Target Population
August 1983	Hajj Umran	Mustard	Fewer than 100	Iranians/Kurds
Oct – Nov 1983	Panjwin	Mustard	3,000	Iranians/Kurds
Feb – Mar 1984	Majnoon Island	Mustard	2,500	Iranians
March 1984	Al Basrah	Tabun	50 to 100	Iranians
March 1985	Hawizah Marsh	Mustard/Tabun	3,000	Iranians
February 1986	Al Faw	Mustard/Tabun	8,000 to 10,000	Iranians
December 1986	Umm ar Rasas	Mustard	Reportedly thousands	Iranians
April 1987	Al Basrah	Mustard/Tabun	5,000	Iranians
October 1987	Sumar/Mehran	Mustard/nerve agents	3,000	Iranians
March 1988	Halabjah[1]	Mustard/nerve agents	Reportedly hundreds	Iranians/Kurds

[1] Iran also used chemicals at Halabjah that may have caused some of the casualties.

of UNSCOM inspectors, Iraq could restart limited mustard gas production within a few weeks, full-scale production of sarin within a few months, and achieve pre-Gulf War production levels – including VX – within two or three years. Since the Gulf War, Iraq has rebuilt two facilities it once used to produce CW agents and has the capability to convert smaller civilian facilities to CW production.

Iraq's Ballistic Missile Program. Iraq had an active missile force before the Gulf War that included 819 operational SCUD B missiles (300 km range) purchased from the Soviet Union, an advanced program to extend the SCUD's range and modify its warhead (e.g., the Al Husayn with a 650 km range and the Al Abbas with a 950 km range), and an extensive effort to reverse-engineer and indigenously produce complete SCUD missiles. UNSCOM reports that it supervised the destruction of 48 SCUD-type missiles, 10 mobile launchers, 30 CW and 18 conventional warheads, and related equipment. UNSCOM has verified Iraq's unilateral destruction of only 83 SCUD-type missiles and nine mobile launchers.

Unmonitored unilateral destruction and discrepancies in Iraqi accounting suggest that Baghdad could still have a small force of SCUD-type missiles and an undetermined number of warheads and launchers. UNSCOM believes it has accounted for all but two of the original 819 SCUD missiles imported from the former Soviet Union. Iraq has not adequately explained the disposition of important missile components that it could not produce on its own and may have removed before destruction. Iraq may have pieced together a small inventory of missiles by integrating guidance and control systems it concealed with indigenously produced parts. Iraq admitted producing SCUD engines, airframes, and warheads before the war, but UNSCOM has not verified claims that it destroyed all of these components. Baghdad probably continues to receive some parts through clandestine procurement networks. In 1995, Jordan interdicted missile guidance equipment (e.g., gyroscopes) bound for Iraq. Baghdad admitted under UNSCOM questioning that it received a similar shipment earlier in 1995. In November 1995, Iraq turned over a previously undeclared SS-21 short-range ballistic missile launcher it acquired from Yemen before the Gulf War, illustrating Iraq's ability to conceal major elements of missile systems from UNSCOM inspectors.

Baghdad has not given up its plans to build larger, longer-range missiles. UNSCOM has uncovered numerous Iraqi design drawings, including multistage systems and clustered engine designs, that theoretically could reach Western Europe. Inspectors have uncovered evidence that Iraq had continued missile research since the imposition of sanctions. If sanctions were lifted, Iraq could probably acquire enough material to resume full-scale production of SCUD-type missiles, perhaps within one year. Iraq's Al-Samoud and Ababil-100 missile programs – within the UN-allowed 150 km range limit – serve to maintain production expertise within the constraints of sanctions. Iraq has apparently flight-tested the Al-Samoud which UNSCOM describes as a scaled down SCUD, successfully. Iraq probably will begin converting these programs into long-range missile production as soon as sanctions are lifted. Iraq continues to expand a missile production facility at Ibn al Haytham, a facility currently used to support its authorized missiles programs. Two new fabrication buildings at the facility are spacious enough to house the construction of large ballistic missiles. Baghdad's claim that the buildings at Ibn al Haytham are intended to be computer and administrative facilities is inconsistent with the facility's inherent size and capacity.

Iraq's Nuclear Weapons Program. Iraq had a comprehensive nuclear weapons development program before the Gulf War that was focused on building an implosion-type weapon. The program was linked to a ballistic missile project that was the intended delivery system. After Husayn Kamil's defection, Iraq retreated from its longtime claim that its nuclear program was intended only to conduct research. Iraq admitted experimenting with seven uranium enrichment techniques and was most actively pursuing electromagnetic isotope separation, gas centrifuge, and gas diffusion technologies. Baghdad planned to build a nuclear device in 1991 by using IAEA-safeguarded highly enriched uranium from its Soviet-supplied reactors. UNSCOM and IAEA inspections have hindered Iraq's nuclear program, but Baghdad's interest in acquiring or developing nuclear weapons has not diminished. Iraq retains a large cadre of nuclear engineers, scientists, and technicians who are the foundation of its nuclear program. There are concerns that scientists may be pursuing theoretical nuclear research that would reduce the time required to produce a weapon should Iraq acquire sufficient fissile material. Iraq continues to withhold significant information about enrichment techniques, foreign procurement, weapons design, and the role of Iraq's security and intelligence services in obtaining external assistance and coordinating postwar concealment. Iraq continues to withhold documentation on the technical achievements of its nuclear program, including associated experimental data and accounting information. Baghdad has not fully explained the interaction between its nuclear program and its ballistic missile program.

Response to the Threat. Additional information on the NBC/M proliferation and NBC terrorist threats may be found in the Intelligence Annex to this report. DoD, DOE, and U.S. Intelligence policy and strategy objectives, which provide a framework in which to deal with NBC/M proliferation and NBC terrorism threats, are summarized in the next section. DoD's military response to counter NBC/M threats is discussed in Section 5. DOE's programs in proliferation prevention are described in Section 6, and U.S. Intelligence's response to countering proliferation is summarized in Section 7. The integrated DoD, DOE, and U.S. Intelligence response to countering paramilitary and terrorist NBC threats is discussed in Section 8. Details of U.S. Intelligence's response, including new initiatives, activities, and programs that address shortfalls in efforts to counter proliferation, may be found in the Intelligence Annex.

4. Policy and Strategy Perspectives for Countering Proliferation and NBC Terrorism

National policy objectives related to countering NBC/M proliferation and NBC terrorism threats are discussed in this section along with the policy and strategy perspectives of DoD, DOE, and U.S. Intelligence. Summaries of the roles and missions of interagency organizations responding to the counterproliferation challenge are also provided.

> ***"Together we must also confront the new hazards of chemical and biological weapons, and the outlaw states, terrorists and organized criminals seeking to acquire them."*** (State Of The Union Address, January 27, 1998)
>
> — William J. Clinton, President of the United States

Early in his administration, President Clinton issued guidance defining national nonproliferation policy objectives in Presidential Decision Directive-13 (PDD-13). This guidance has been effective in shaping a coherent and unified plan of action for DoD, DOE, and U.S. Intelligence to work together in an interorganizational effort to counter both the proliferation of NBC/M and NBC terrorism. Figure 4.1 serves to summarize the key documents that define U.S. policy for countering NBC/M proliferation and NBC terrorism, along with those that establish the policy and strategy objectives of the CPRC-represented organizations in furtherance of U.S. national policy.

4.1 National Perspectives

The proliferation of NBC/M is not a hypothetical threat to the United States. More than 25 countries have, or may be developing, NBC/M, and a larger number are *capable* of producing such weapons, potentially on short notice. In addition, the NBC proliferation threat has become transnational and include terrorist organizations or organized crime groups. The United States will need perseverance, patience, and imagination to combat this daunting challenge. There has been a dramatic reduction in the threat from the FSU states. Through a wide array of arms control and denuclearization treaties and initiatives, the U.S. has achieved considerable success in stemming the proliferation of NBC/M. The Nunn-Lugar Cooperative Threat Reduction program, the Nuclear Non-Proliferation Treaty, the Comprehensive Test Ban Treaty (CTBT), the Missile Technology Control Regime, the Australia Group, the Chemical Weapons Convention, and the Biological Weapons Convention have all contributed to slowing, and in some cases, rolling back NBC/M proliferation. The vigorous pursuit of these policies has raised the price of access to, and reduced the demand for, NBC/M. The U.S. is attempting to devalue the attractiveness of NBC/M by providing regional security strategies, providing incentives for acquisition abstinence, fielding defensive capabilities to render these weapons militarily ineffective, and taking steps to ensure that proliferators clearly perceive a credible risk of economic and military responses if proliferation occurs or if NBC weapons are used.

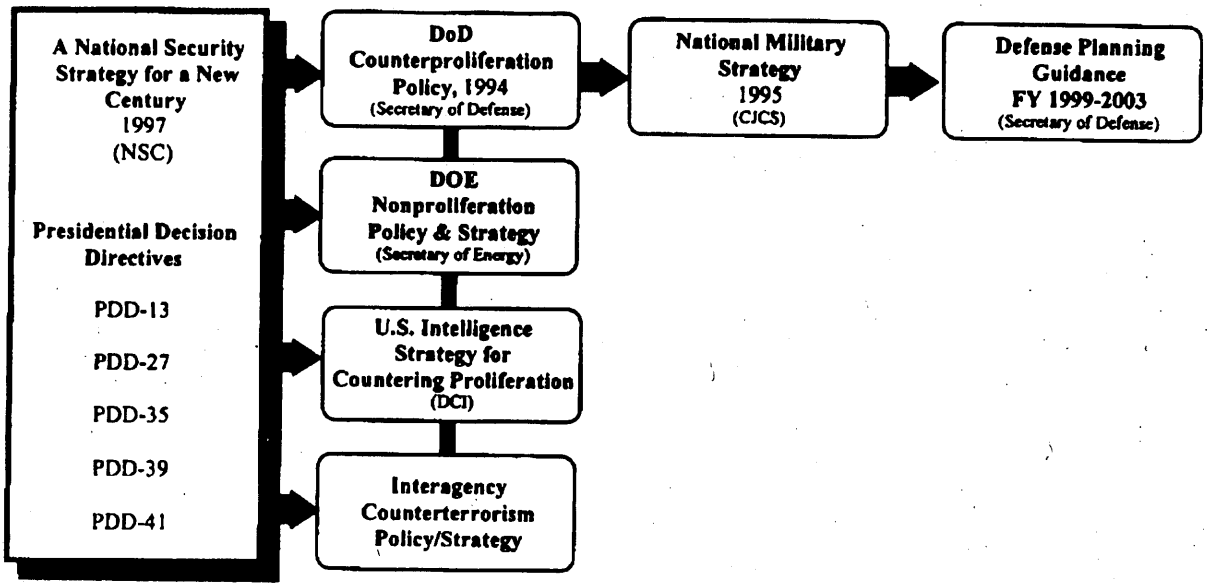


Figure 4.1 Key Documents Defining Policy and Strategy Objectives for Countering Proliferation and NBC Terrorism

There are three components to the U.S. response to NBC/M proliferation: preventing proliferation from occurring, protecting U.S. forces and citizens against NBC weapons, and being able to respond against those who would use NBC weapons against the U.S. Prevention of proliferation is the first priority. However, the United States will not be successful in preventing proliferation all the time, and in all places. When proliferation occurs and U.S. interests and commitments are threatened, the U.S. must be in a position to prevail during a crisis or on the battlefield, even against opponents who possess NBC weapons. DoD has responsibilities for the military responses needed if prevention fails: active defense, passive defense, counterforce, and response to paramilitary/covert threats. Several U.S. government agencies, including the CPRC-represented organizations, work together to respond to the NBC terrorism threat. Development of a coherent, effective national response has required policy initiatives, adaptation of military planning and operations, acquisition of new capabilities, new intelligence community programs, and international cooperation.

4.2 DoD Perspectives

Within the broader framework of U.S. government activities to counter proliferation, the DoD bears unique responsibilities for deterring and countering regional CW/BW threats. Where diplomatic and other efforts to prevent proliferation fail, U.S. military forces must be prepared to operate effectively in CW/BW warfare environments by employing both offensive and defensive measures. Doing so strengthens deterrence by reducing the incentives of attack and serves as an insurance policy should deterrence fail.

> ***"The proliferation of weapons of mass destruction and the ballistic missiles that deliver them pose a major threat and must remain a major focus of U.S. defense policy and budget allocations."*** (February 1997)
>
> ***"We should expect more countries and terrorist groups to seek—and to use—such weapons. Countering the proliferation threat will be a top security challenge of the 21st century."*** (November 26, 1997)
>
> ***"The threat from nuclear, biological and chemical weapons is global. This proliferation worries all nations who are devoted to peace and the security of their people."*** (December 1, 1997)
>
> — William S. Cohen, Secretary of Defense

The Quadrennial Defense Review concluded that the threat or use of CW/BW is a "likely condition of future warfare." It noted that U.S. and allied forces could be especially vulnerable to CW/BW attacks in the early stages of operations when concentrated at airbases, ports and other key logistical nodes. Because of the prevalence of such capabilities in the hands of potential future adversaries and the likelihood that such adversaries would resort to such means in the face of overwhelming U.S. conventional dominance, U.S. forces must plan and prepare to fight and win major theater wars as well as to perform smaller-scale contingency operations under such conditions.

Accordingly, U.S. forces must be properly trained and equipped to operate effectively and decisively in the face of CW/BW attacks. This requires that the U.S. military continue to improve its capabilities to locate and destroy CW/BW and their delivery systems, including in hard and/or deeply buried facilities, preferably before such weapons can be used, and defend against and manage the consequences of CW/BW if they are used. But capability enhancements alone are not enough. Equally important will be adapting U.S. doctrine, operational concepts, training, and exercises to take full account of the threat posed by CW/BW as well as other likely asymmetric threats. Moreover, given that the United States will most likely conduct future operations in coalition with others, we must also encourage our friends and allies to train and equip their forces for effective operations in CW/BW environments.

4.3 DOE Perspectives

DOE actively contributes to national efforts to stem NBC/M proliferation by pursuing several initiatives, focusing primarily on nuclear proliferation prevention. These include limiting weapons-usable fissile materials worldwide, strengthening the Nuclear Nonproliferation Regime, controlling nuclear exports, establishing transparent and irreversible nuclear reductions worldwide, and securing nuclear materials in states of the FSU.

DOE is attempting to limit the amount of available weapons-usable fissile material by promoting alternatives to the civilian use of plutonium, eliminating the civilian use of highly

enriched uranium (HEU), initiating regional fissile material control activities, and assisting in the shutdown of Russian plutonium production reactors. Full scale work on the development of advanced high density, low enriched uranium fuel for research reactor conversion is ongoing. DOE is also encouraging the conversion of additional HEU-fueled reactors to enable the utilization of low enriched uranium fuel.

Strengthening the Nuclear Nonproliferation Regime is a key DOE nonproliferation initiative. DOE is working to increase the effectiveness and efficiency of the IAEA, facilitating IAEA inspections of excess fissile materials, preparing for implementation of the CTBT, and promoting regional nonproliferation measures. DOE is providing direct technical assistance to improve the safeguards effectiveness and efficiency of IAEA inspections in North Korea and Iraq.

DOE is assisting the international community in effectively controlling exports of nuclear materials and establishing responsible supplier policies, implementing U.S. statutory licensing requirements for nuclear or nuclear-related export controls, fostering transparency through automated information sharing and security initiatives, and enhancing export controls in FSU states. DOE is working with the FSU states, Eastern Europe, and with UNSCOM to expand training in strategic material identification and prevention of illicit trafficking in nuclear weapon-related materials and components. In hand with this initiative is DOE's effort to establish transparent and irreversible nuclear reductions worldwide. Working with the states of the FSU, DOE is exchanging and confirming data on weapons materials inventories and conducting reciprocal bilateral inspections of nuclear weapons-related materials and components. DOE is committed and determined to fully implement all transparency measures and U.S. rights at all Russian facilities engaged in activities covered under the U.S.-Russian HEU Purchase Agreement.

The joint effort by the U.S. and Russia to secure the nuclear materials of FSU states is an important initiative and a high priority of U.S. nonproliferation policy. Working with Russia, states of the FSU, and the Baltic states, DOE is improving and expanding material protection, control and accounting (MPC&A) activities at every facility where weapons-usable nuclear materials are stored or transported. Assisting Russia and the FSU states in establishing strong and enduring national systems of MPC&A is a high national nonproliferation priority.

4.4 U.S. Intelligence Perspectives

U.S. Intelligence actively contributes to national efforts to stem proliferation by supporting policy makers in identifying, stopping, and rolling back NBC/M proliferation where it occurs, assisting in operations to slow proliferation activities, and supporting development of countermeasures against NBC/M threats. U.S. Intelligence assists in adapting U.S. military forces and emergency assets to deal with these threats by: i) identifying capabilities, vulnerabilities, and performance characteristics of NBC/M threats; ii) uncovering adversary use doctrine and operational strategy; and iii) providing indications and warning of potential NBC/M use. In supporting efforts to roll back NBC/M proliferation, U.S. Intelligence continuously updates the status of foreign NBC/M programs and identifies NBC/M program incentives, disincentives, and vulnerabilities.

Key U.S. Intelligence initiatives for future improvement in capabilities to counter proliferation include:

- Assisting in the development of innovative tools to influence rolling back existing capabilities and programs or deterring the use of NBC/M;
- Providing insight into the plans, intentions, and motivations of those who seek to develop, buy, sell, or use these weapons;
- Acquiring information needed to counter the operational effectiveness of these weapons or reduce the collateral damage associated with their accidental or intentional use;
- Providing timely and accurate assessments of worldwide efforts to develop, sell, transfer, stockpile, deploy, test, or use NBC/M and destabilizing advanced conventional weapons; and
- Providing information regarding compliance with nonproliferation regimes.

4.5 Counterterrorism Response Perspectives

The potential for terrorist use of NBC weapons is a growing concern to U.S. policy makers. It is U.S. policy to deter, defeat, and respond vigorously to terrorist attacks on U.S. territory, against U.S. citizens and their property, or against U.S. facilities, whether they occur domestically, in international waters or airspace, or on foreign territory. The U.S. regards terrorism as a potential threat to national security as well as a criminal act and will apply all appropriate means to combat it. The acquisition of NBC weapons by terrorist groups, through theft, manufacture, or other means, is unacceptable. There is no higher priority than preventing the acquisition of NBC weapons by terrorist organizations or removing such a capability once acquired. Developing effective means to detect, prevent, defeat, and manage the consequences of NBC weapons use by terrorists is also of the highest priority. Furthermore, the U.S. shall seek to identify groups or states that sponsor or support such terrorist activity, isolate them, and extract a heavy price for their actions. DoD, DOE, and U.S. Intelligence are actively engaged in supporting U.S. counterterrorism policy objectives.

4.6 Interagency Organizations Responding to the Challenge of Countering Proliferation

A key part of U.S. strategy to counter NBC/M proliferation and NBC terrorist threats is the establishment of interagency organizations to address critical policy, strategy, and R&D/acquisition objectives. The CPRC concentrates on ensuring that interagency R&D and acquisition activities and programs of DoD, DOE, and U.S. Intelligence meet U.S. policy and strategy objectives for countering NBC/M proliferation and NBC terrorism. Other interagency organizations address complementary aspects of national policy and strategy objectives associated with countering NBC/M proliferation and NBC terrorist threats. Listed below are some of these interagency organizations for which DoD, DOE, and U.S. Intelligence play key roles.

The Nonproliferation and Arms Control Technology Working Group (NPAC TWG). The President established the NPAC TWG in August 1994, pursuant to a comprehensive review of

interagency arms control and nonproliferation R&D coordination activities. The Arms Control and Disarmament Agency (ACDA), DOE, and DoD were designated as co-chairs, with ACDA serving as Executive Secretary. The NPAC TWG was established to facilitate the coordination of arms control and nonproliferation R&D as well as helping to guard against redundant R&D and technology development programs within and among departments and agencies. As an integral component of the interagency process, the NPAC TWG reports to the relevant NSC policy Interagency Working Groups and, through the Committee for National Security (CNS), to the National Science and Technology Council (NSTC). The chartered NPAC TWG functions include: i) exchange information and coordinate arms control and nonproliferation R&D; ii) advise agencies on R&D priorities; iii) facilitate the conduct of cooperative interagency programs; iv) review R&D programs; v) identify overlaps and gaps; vi) frame interagency issues and differences for decisions by adjudicating bodies; vii) advise policy Interagency Working Groups on R&D capabilities and limitations; and viii) make recommendations, through the CNS, to the NSTC on coordination of all nonproliferation and arms control-related R&D programs in the President's Budget. To ensure the comprehensiveness of its activities, the NPAC TWG's formal membership includes 27 departments, agencies, and organizations of the U.S. government, with more than 87 organizations regularly participating in the NPAC TWG process.

The Technical Support Working Group (TSWG). The TSWG maximizes multi-agency participation to identify requirements and coordinate R&D for joint users in combating terrorism. Representatives from eight Departments and over 50 organizations throughout the U.S. government promote identification of current and future requirements for countering terrorism, establishing priorities, and preventing unnecessary duplication of effort. The TSWG was established in 1986 in response to a vice-presidential task force finding that better coordination and focus were needed for R&D activities associated with combating terrorism. It is the technology development component of the NSC Interagency Working Group on Counterterrorism, which is chaired by the DOS Coordinator for Counterterrorism. Under the oversight of the Coordinator's office, the TSWG is co-chaired by the DoD and DOE. The DoD chair is from the Acquisition Directorate in OASD(SO/LIC). While its funds are derived principally from DoD's Counterterror Technical Support (CTTS) Program, additional funds are controlled by DoD's Counterproliferation Support Program and the Departments of State, Justice, and Energy and FEMA. Although the TSWG is primarily concerned with rapid prototype development of equipment to address critical multi-agency and future threat counter- and anti-terrorism requirements, it has recently increased its efforts in conducting longer term R&D efforts in selected problem areas. Historically, developing countermeasures against NBC weapons has been a focus area of TSWG activity, and developing techniques to detect, neutralize, and mitigate CW/BW agents remains a priority. In addition to NBC countermeasures, physical security, especially as it relates to force protection, has become a major focus area. As a result of a Senate initiative for joint counterterrorism R&D efforts with NATO and non-NATO allies, the TSWG took on an international dimension in FY 1993. It now has three bilateral agreements and active projects with Israel, Canada, and the United Kingdom. The TSWG has successfully transitioned capabilities to the Departments of Defense, Justice, State, Treasury (Secret Service, Customs, and the Bureau of Alcohol, Tobacco, and Firearms), U.S. Intelligence, the Federal Aviation Administration, the Public Health Service, and other agencies.

The Community Nonproliferation Committee. This committee develops and coordinates joint integrated intelligence requirements across the interagency spectrum. The primary vehicles

for coordination are biweekly video conferences involving intelligence and policy officials. The policy ramifications of changes in the threat are discussed, usually leading to a focused set of intelligence needs. In most cases, U.S. Intelligence is able to take immediate steps to address these needs.

The MASINT BW Technology Steering Group. In 1995, the Central MASINT (Measurement and Signature Intelligence) Office (CMO) organized a senior level MASINT BW Technology Steering Group consisting of the Director and Principal Deputy Director of the CMO; the Director of the Nonproliferation Center; ATSD(NCB)'s Deputy for Counterproliferation and Chemical/Biological Defense; the Deputy Director of the Central Intelligence Agency's (CIA) Office of Research and Development; and the CIA's Director, Clandestine MASINT Operations Group, Office of Technical Collection. New members added in 1997 were the Defense Advanced Research Projects Agency's (DARPA) Defense Science Office and DOE's Office of Nonproliferation and National Security. These organizations represent the majority of elements within the U.S. government that fund BW defense-related R&D. The steering group is responsible for identifying: i) national BW MASINT needs and requirements within U.S. Intelligence and DoD; ii) technologies and programs currently being developed and/or applied; iii) technology areas and programs outside U.S. Intelligence and DoD that could support national BW MASINT needs; and iv) gaps and overlaps among programs. The steering group meets quarterly to review areas of common interest. In addition, the group sponsors one BW defense and one CW defense MASINT technology symposium annually. These fora, hosted by the CMO, provide an excellent opportunity to share technologies and ideas at the scientific level. Substantial cost savings have resulted from the cross-fertilization of ideas and technologies among the various technology group members.

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5. DoD Counterproliferation Programs

In this section, DoD activities and programs strongly related to counterproliferation are discussed. Section 5.1 is devoted to a discussion of key developments affecting DoD's overall Counterproliferation Initiative, including the Quadrennial Defense Review, the Defense Reform Initiative, the activities of the Counterproliferation Council, CINC and Joint Staff counterproliferation planning activities, key counterproliferation studies, an overview of international cooperative activities, and an update on the current activities of the Counterproliferation Support Program. DoD activity and program descriptions are provided in Sections 5.2 - 5.8 and organized in terms of the counterproliferation functional areas of proliferation prevention, strategic and tactical intelligence, battlefield surveillance, NBC/M counterforce, active defense, and passive defense. DoD programs associated with countering paramilitary and terrorist NBC threats are discussed in Section 8, together with DOE and U.S. Intelligence programs in this area. In Sections 5.2 - 5.8, key activity and program accomplishments and milestones are summarized, and FY 1999 budget data are provided. Additional programmatic details are provided in Appendix C. Finally, Section 5.9 summarizes how the accomplishments of DoD activities and programs directly address the counterproliferation ACEs.

5.1 Introduction and New Developments

DoD Policy and Strategy Objectives. U.S. armed forces must be fully prepared to counter the military threats posed by NBC weapons. With senior DoD officials playing an active role in providing management oversight of the Defense Counterproliferation Initiative, the Department continues to make substantial progress toward fully integrating counterproliferation activities into its military planning, acquisition, intelligence, and international cooperation activities. These efforts have been built on the formal policy guidance issued by the Secretary of Defense in May 1994, follow-on guidance contained in internal planning and programming documents, and a DoD Directive on Counterproliferation issued in July 1996 that delineates specific responsibilities, formalizes relationships among DoD organizations, and establishes common terms of reference.

These documents reflect the Department's role in the entire spectrum of U.S. government activities related to countering NBC proliferation – from supporting diplomatic efforts to prevent or contain proliferation, to protecting the United States and its friends and allies and their military forces from NBC attacks. DoD policy to counter proliferation underlies strengthened efforts to prevent proliferation and to protect U.S. forces, interests, and military capabilities and requires U.S. forces to be prepared to execute offensive and defensive military operations to counter the deployment and employment of NBC weapons. The major objectives of DoD counterproliferation policy are:

- Support overall U.S. government efforts to ***prevent*** the proliferation of NBC weapons and associated delivery systems;

- Support overall U.S. government efforts to ***roll back*** proliferation where it has occurred;

- ***Deter*** and ***prevent*** the effective use of NBC/M against the U.S., its allies, and U.S. and allied forces; and

- ***Adapt*** U.S. military forces, planning, doctrine, and training to maintain their operational tempo and accomplish their missions despite the presence, threat, or use of NBC/M.

To achieve these policy objectives, U.S. forces should possess a spectrum of capabilities. The R&D and acquisition programs and other DoD activities under way and being established are designed to bring these capabilities to fruition; they are discussed in Sections 5.2 through 5.8 below and in Section 8.

5.1.1 The QDR's Impact on Countering Proliferation and NBC Terrorism. DoD's QDR was issued in May 1997 by the Office of the Secretary of Defense. It builds on the President's National Security Strategy, developing an overarching defense strategy to identify required military capabilities and define the programs and policies needed to support those capabilities. The QDR identifies the threats posed by the proliferation of NBC/M and associated technologies in the regions of highest concern to the U.S. Part of the strategy stated within the QDR is to curb NBC/M proliferation by garnering the cooperation of other nations while continuing to improve capabilities to locate and destroy NBC weapons, preferably before they can be used. One of the requirements of U.S. defense strategy is to be able to achieve war aims against an adversary who uses or threatens to use NBC weapons, terrorism, or other asymmetric means against the U.S. Because of the prevalence of such capabilities in the hands of potential future adversaries and the likelihood that such adversaries would resort to such means in the face of overwhelming U.S. conventional dominance, U.S. forces must plan and prepare to fight and win major theater wars under such conditions.

The QDR calls for improved protection against CW/BW threats for U.S. forces. New CW/BW detectors, improved individual protective gear, and a greater emphasis on collective protection are all critical to DoD's efforts to protect its soldiers, sailors, airmen, and Marines from asymmetric threats. The counterproliferation-related decisions published in the QDR include maintaining NMD as a high national priority and increasing both the focus and funding for countering asymmetric threats such as those posed by NBC/M proliferation and NBC terrorism. Two key challenges stressed in the QDR are that DoD must, as part of its strategy to ensure future counterproliferation preparedness: i) *institutionalize* counterproliferation as an organizing principle in every facet of military activity, from logistics to maneuver-and-strike warfare; and ii) *internationalize* those same efforts to encourage our allies and potential coalition partners to train, equip, and prepare their forces to operate with U.S. forces under NBC threat conditions. To advance the institutionalization of counterproliferation concepts and capabilities addressed in the QDR, the Secretary of Defense directed a $1 billion increase in counterproliferation funding over the FY 1999-2003 program period. This increase is being allocated in the following areas: i) passive defense, including improved individual protection gear, collective protection systems, CW/BW agent detectors, decontamination equipment, and vaccines ($732 million); ii) counterforce, including improvements for attacking CW/BW, hardened, and underground facilities and CW/BW agent defeat munitions ($146 million); and iii) SOF enhancements ($87 million). A planned increase of $35 million for active defense programs was not allocated.

A follow-on study to the QDR, *Transforming Defense: National Security in the 21st Century*, was conducted by the National Defense Panel and released in December 1997. This panel was charged with analyzing potential threat scenarios out to the year 2020 and providing recommendations for appropriate defenses to meet 21st century threats. Regarding the threat of NBC/M, the panel recommended: i) developing appropriate defense measures organic to U.S. deployed forces; ii) giving highest priority to NBC detection capabilities; and iii) providing a conventional, non-nuclear deterrent capability against the use of NBC/M.

5.1.2 DoD's Defense Reform Initiative (DRI). The DRI, announced in November 1997, represents a major reform in how DoD does business. It resulted from a high level review led by the Deputy Secretary of Defense and includes the insights of many business leaders experienced with major business restructuring. The goal of the restructuring is to bring modern business practices to DoD that will enable DoD to respond more quickly and more efficiently to new threats and take better advantage of technological opportunities that hold the promise of enhancing military capabilities. The DRI impact on the CPRC is significant. It calls for the elimination of the ATSD(NCB) position, which serves as the Executive Secretary of the CPRC and Chairman of the CPRC Standing Committee. It also calls for the elimination of subordinate positions under ATSD(NCB), including the Deputy for Counterproliferation and Chemical/Biological Defense (DATSD(NCB)(CP/CBD)), who provides management oversight of the Counterproliferation Support Program, the CBD Program, and technical and administrative support to the CPRC. The functions presently provided by these entities will be shifted to the new Defense Threat Reduction Agency (DTRA). Several options are being examined to determine the future role of DATSD(NCB)(CP/CBD) within a re-organized OSD as well as potential roles within DTRA. DTRA will be composed of the Defense Special Weapons Agency (DSWA), the On-Site Inspection Agency (OSIA), the Defense Technology Security Administration (DTSA), and other OSD offices. In addition, the position of Assistant Secretary of Defense for International Security Policy has been incorporated under the Assistant Secretary of Defense for Strategy and Threat Reduction (ASD(S&TR)). As implementation of the DRI proceeds, the Deputy Secretary of Defense is working to ensure that appropriate level DoD officials will continue to chair and support the CPRC and its Standing Committee, consistent with the CPRC's congressional charter.

5.1.3 DoD's Counterproliferation Initiative. DoD's Counterproliferation Initiative is the Department-wide effort to meet the defense challenges posed by NBC weapons and their means of delivery. It was established to ensure that U.S. forces are prepared to conduct successful military operations in an NBC-contaminated environment. For FY 1999, DoD will invest over $5.9 billion in programs strongly related to counterproliferation, up from the FY 1998 investment of nearly $4.9 billion.

Activities of the CP Council. To ensure that DoD's broad counterproliferation policy objectives are met and that the implementation of the Counterproliferation Initiative is integrated and focused, the Secretary of Defense established the DoD Counterproliferation Council in April 1996. The "CP Council" is chaired by the Deputy Secretary of Defense and includes the Under Secretary of Defense for Acquisition and Technology (USD(A&T)), the Under Secretary of Defense for Policy, the Vice Chairman of the Joint Chiefs of Staff, the Under Secretaries of the Military Departments, the Vice Chiefs of the Military Services, and the Director for Strategic Plans and Policy of the Joint Staff. The ASD(S&TR) serves as Executive Secretary for the CP Council.

Through the complementary themes of "institutionalizing" and "internationalizing," the CP Council monitors departmental progress in developing the strategy, doctrine, and force planning necessary to execute counterproliferation objectives effectively. It also monitors DoD-wide efforts at training, exercising, and equipping U.S. forces for integrated operations in an NBC environment, as well as overseeing DoD counterproliferation activities in interagency and international fora. The CP Council meets regularly, focusing on the potential impact of NBC/M proliferation on the Department's requirement to fight two nearly simultaneous Major Theaters of War (MTWs). In this connection, the Council identified the importance of understanding the likely NBC employment concepts and plans of proliferants and took steps to ensure that the focused intelligence assessments in these areas support the development of U.S. regional military plans, as well as doctrine and exercising policies. It also informed senior DoD leaders on deficiencies in current CINC plans for operating in a CW/BW environment.

5.1.4 CINC Counterproliferation Priorities and Planning Activities. DoD's counterproliferation responsibilities include the application of military force, when necessary. Deriving the CINCs' formal warfighting plans follows a deliberate and formalized "national objective-to-task" process that proceeds from top-level Presidential guidance and instructions down to specific military operational plans and activities. The National Security Strategy, Presidential Decision Directive-13, and the Counterproliferation Policy Guidance of the Secretary of Defense provide the framework for counterproliferation planning. Three Joint documents that have evolved from these broad guidance documents are the CJCS's *Missions and Functions Study*, the *Counterproliferation Charter*, and the *Counterproliferation CONPLAN 0400*. These key documents serve as the prerequisites for beginning the CINCs' formal planning process to execute U.S. counterproliferation policy.

Because the challenges of counterproliferation involve new policy considerations, the *Missions and Functions Study* was a special effort chartered by the Secretary of Defense to facilitate future DoD counterproliferation planning. The study was a combined effort by the Joint Staff, Services, CINC representatives, and OSD. Its key findings are: i) each geographic CINC is responsible for executing U.S. counterproliferation policy within his area of responsibility (AOR); and ii) implementation of counterproliferation policy within each AOR is executed via each CINC's standard deliberate planning process. This planning process included the development of the overarching CJCS's *Counterproliferation CONPLAN 0400*, prior to each CINC developing an AOR-specific counterproliferation CONPLAN (concept plan).

The findings of the *Missions and Functions Study* were approved by the Secretary of Defense in May 1995. He further directed the *Counterproliferation Charter* be written to support the development of the *Counterproliferation CONPLAN 0400*. The *Counterproliferation Charter* was approved by the CJCS and the Secretary of Defense and supplements the top-level guidance documents delineated above by providing more of a military focus for the counterproliferation mission. The CJCS's *Counterproliferation CONPLAN 0400* provides guidance in terms of national counterproliferation operational objectives and tasks. These operational objectives and tasks were derived from an analysis of top-level U.S. policy documents relevant to the counterproliferation mission. They have been coordinated throughout the Commands and within OSD. These counterproliferation operational objectives and tasks will guide the CINCs through

the development of their AOR-specific CONPLANs which are due to the Joint Staff for review in August 1998.

The CINCs' Counterproliferation Required Capabilities. The current CINCs' listing of 16 counterproliferation required capabilities, considered necessary to conduct the counterproliferation mission from a military warfighting perspective, was developed by the Joint Staff's Deterrence/Counterproliferation JWCA team, approved by the Joint Requirements Oversight Council (JROC), and endorsed by the CINCs in 1996. The required capabilities list evolved from a series of Operational Planning Workshops (OPWs) with each of the CINCs. The workshops reviewed national objectives that support the U.S. national goal of countering proliferation. Deterrence/Counterproliferation operational tasks and required military capabilities were identified and validated from the CINC perspective. As of this writing, a new OPW process is under way. The CINCs generally put the highest priority on those areas where the most leverage could be exercised for getting enhanced capabilities out to the field quickly. Table 5.1 lists the CINCs' required counterproliferation capabilities. It also illustrates the evolution of the current required capabilities from the CINCs' original counterproliferation priorities established by the Deterrence/Counterproliferation JWCA and approved by the JROC in 1994. This evolution reflects the CINCs' need for improved capabilities and technologies to support timely counterproliferation-related intelligence, conventional counterforce response with minimal collateral effects, and the activities of SOF in countering paramilitary and terrorist threats. The Deterrence/Counterproliferation JWCA will revalidate the CINCs' counterproliferation required capabilities in 1998. The CINCs' counterproliferation required capabilities are reviewed annually by the CPRC and serve as a basis for the counterproliferation ACEs. The CPRC ACEs focus on capability *shortfalls* whereas the CINCs focus on capability *requirements*. This comparison is also summarized in Table 5.1.

5.1.5 Key Counterproliferation Studies and Analyses. Several studies initiated or completed since last year's report and addressing military operations in NBC contaminated environments, are having a significant impact on counterproliferation planning. They are described in this subsection.

The 1996-1997 Joint WMD Analysis. In early 1996, the JROC, initially concerned with the issue of medical force structure requirements, requested that NBC weapons effects be included in Joint Staff (J-4, Logistics) evaluations of wartime medical requirements and that J-8 (Force Structure, Resources, and Assessment) address the employment of NBC weapons in military campaigns. A General Officer Steering Group was formed to oversee a year-long analytical effort to quantify warfighting impacts of NBC weapons employment in two MTWs. The analytical objectives of the Steering Group were achieved by a working group, chaired by the J-8/Warfighting Analysis Division with members from numerous DoD organizations. The first phase of the Joint WMD Analysis was devoted to the formulation of critical warfighting assumptions, construction of scenarios, and selection/integration of analytical tools. These assumptions, scenarios, and tools were utilized in quantitative warfighting assessments during the second analytical phase. Medical casualty estimates, operational and logistical effects, policy implications, and risk were emphasized throughout the analysis. Analyses of several scenarios set in Korea and Southwest Asia quantified the overall combat effectiveness of U.S. and allied forces in the presence of hostile CW/BW environments, underscored the importance of U.S. active and

Table 5.1: Evolving CINC Counterproliferation Priorities and Required Capabilities

1994 CINC Counterproliferation Priorities
1. Detection and characterization of BW and CW agents
2. Intercept cruise missiles
3. Defeat underground targets
4. Characterization and identification of underground targets
5. Collect and analyze intelligence
6. Passive defense enabling operations
7. Support for operations in an NBC environment
8. Production of BW agent vaccines
9. Planning and targeting for above ground infrastructure
10. BW/CW agent defeat
11. Detection and tracking of shipments
12. Prompt mobile target kill
13. Support for Special Operations Forces
14. Locate, detect, and disarm WMD in CONUS and OCONUS

CINC OPWs

1996 CINC Counterproliferation Required Capabilities	Corres. ACE*
1. CP intelligence cycle	8
2. Conventional response with minimal collateral effects	2, 3
3. SOF response and intelligence collection/analysis targeting covert/paramilitary/terrorist threats	5, 6
4. Battlefield NBC detection and warning	1
5. Theater missile defense with minimum collateral effects	4
6. Defeat underground targets	3
7. Target planning/analysis including collateral effects prediction and post-strike assessment	11
8. Individual protection	9
9. Proliferation pathway analysis	13
10. Cruise missile and aircraft defense with minimum collateral effects	7
11. Collective protection	9
12. Mobile target defeat	12
13. Offensive information warfare	-
14. CP consequences logistics capability	9
15. Decontamination	9
16. NBC medical treatments	9, 10

* DoD ACE Prioritization

passive defenses, and identified issues surrounding host nation support. Results of the Joint WMD Analysis were presented to key participants in the QDR, the National Defense Panel, and to the Secretary of Defense. A classified final report was released in March 1998. A follow-on study is now under way and efforts are being made to improve critical warfighting assumptions, refine analytical tools, and vary key NBC weapons-related parameters over plausible ranges to assess sensitivities.

QDR Modernization Panel Directed Study: Preventing Nuclear (Radiological), Chemical, and Biological Weapons and Materials from Entering the United States. This follow-on study to the QDR focused strictly on the prevention of NBC/M materials from entering the U.S. The study panel recommended: i) more effective organization; ii) clarification of existing policy and implementation plans; iii) improved collection, analysis, and information sharing; iv) technology enhancements to aid plans and policies; v) that DoD pursue cooperative means with DOE and DOS to control nuclear materials and establish international agreements for

handling incidents involving nuclear materials; and vi) the commitment of additional resources for personnel, training, research, development, and acquisition to address the problem.

Air Force Studies. Based on CINC war game results, the Air Force initiated three studies entitled: *Sustaining Air Mobility Operations in a WMD Environment, Counter Chemical and Biological Warfare Operations Counterforce,* and *Fighting the Base.* These studies are being conducted concurrently and are expected to be completed between June and November 1998. The *Sustaining Air Mobility Operations in a WMD Environment* study is assessing the impact of an adversary's use of CW/BW on strategic air mobility. The study results will recommend theater programmatic and non-programmatic adjustments to improve systemic mobility operations and mitigate current CW/BW effects and contamination vulnerabilities. The *Counter Chemical and Biological Warfare Operations Counterforce* study is a six-month effort that seeks to answer three questions: What counterforce capabilities are required to meet the CW/BW threat? What are the strengths and weaknesses of the current Air Force CW/BW counterforce capability? What prioritized steps should the Air Force take to preserve strengths and overcome weaknesses? The study's objective is to produce a set of specific, actionable recommendations for materiel and non-materiel changes that will improve the Air Force's ability to conduct counterforce operations against CW/BW and related targets. The *Fighting the Base* study will determine how air base activities are affected by CW/BW contaminants and identify ways to strengthen areas of weakness. The study will address the following central questions: In what ways do different CW/BW attack profiles spread contaminants over a base? How do various degrees of contamination impact operations? What are potential materiel and non-materiel solutions? The study approach will identify baseline requirements (e.g., infrastructure, consumables, personnel) by theater and by aircraft type, understand impacts of five contamination scenarios, and develop options to lessen the impact of conducting air base operations in a contaminated environment.

Assessment of the Impact of Chemical and Biological Weapons on Joint Operations in 2010 ("CB 2010 Study"). This study, which included senior retired officers from all four Services, addressed the potential impact of CW/BW on joint operations based on political and military situations that may exist in the year 2010. The increasing reliance on force projection as the foundation of U.S. national security strategy requires that the vulnerabilities in that approach be seriously addressed. It further concluded that military operations, conducted according to the current tenets of power projection, are likely to suffer *delayed and disrupted* schedules if U.S. deployment facilities, prepositioned materiel, or key reception sites in the area of responsibility are attacked with CW/BW agents. The study group recommended that the focus of DoD policies, Service doctrine, and CW/BW defense programs be broadened to recognize that the nation's ability to project power is vulnerable to CW/BW attack in the force projection phase of a conflict, including attacks within the U.S. To redress these vulnerabilities the study recommends: i) vulnerability definition and analysis; ii) policy guidance and emphasis from the top leadership of OSD, JCS, the CINCs, and the Services; iii) enhanced R&D on new capabilities to counter tailored and terrorist use of CW/BW; iv) reduction of force structure CW/BW vulnerabilities at force projection nodes; and v) development of Service programs to address Service-specific vulnerabilities.

5.1.6 The Counterproliferation Support Program. At the heart of DoD's Counterproliferation Initiative is the Counterproliferation Support Program which seeks to

leverage ongoing R&D and acquisition activities to expedite the fielding of enhanced capabilities to counter NBC/M threats. The Counterproliferation Support Program was established by the Deputy Secretary of Defense in August 1994 to address key shortfalls in counterproliferation capabilities identified by the CPRC's predecessor, the NPRC. The ATSD(NCB) and his Deputy for Counterproliferation were tasked with implementing the program, doing so in close consultation and coordination with the CPRC, the Joint Staff and JROC, the CINCs, the Services, DoD Agencies, and cognizant components of OSD. This cooperation is ongoing and continuing.

Mission of the Deputy for Counterproliferation and Chemical/Biological Defense. The ATSD(NCB) and his Deputy for Counterproliferation and Chemical/Biological Defense (DATSD(NCB)(CP/CBD)) serve as the central point of contact for DoD counterproliferation R&D and acquisition programs and are responsible for managing the Counterproliferation Support Program and the Chemical/Biological Defense Program. DATSD(NCB)(CP/CBD)'s counterproliferation mission is to: i) provide management oversight for the R&D and acquisition aspects of DoD's Counterproliferation Initiative to ensure it fully supports the President's policy to limit the spread of and contain the threat from NBC/M; ii) manage the Counterproliferation Support Program; and iii) coordinate DoD counterproliferation R&D and acquisition efforts with DOE, U.S. Intelligence, and other federal agencies. Oversight of the R&D and acquisition aspects of the Counterproliferation Initiative is accomplished by: i) participating in Program Objective Memorandum (POM) and Programming, Planning and Budgeting System reviews, Departmental planning and policy development, and acquisition oversight activities; ii) serving as facilitator across individual program boundaries; and iii) interacting with the Joint Staff, JROC, the Deterrence/Counterproliferation JWCA, the CINCs, and OSD/Policy to ensure their counterproliferation priorities are adequately addressed. In its role as interagency integrator and coordinator of programs related to counterproliferation, the DATSD(NCB)(CP/CBD) seeks to maximize the payoff from the national investment in counterproliferation-related activities, facilitate interactions between the DoD R&D and acquisition communities and other U.S. government agencies, and identify non-DoD programs to meet CINC and other DoD user needs.

Counterproliferation Mission Statement

The mission of the Counterproliferation Office is to advocate, focus, and accelerate acquisition capabilities to ***prevent*** proliferation of weapons of mass destruction and to ***prevail*** decisively when confronted with their use.

The Counterproliferation Mission Statement reflects the goal of the Counterproliferation Support Program, the purpose of which is to improve specific military counterproliferation capabilities by: i) building on ongoing programs in the Services, DoD agencies, DOE, and U.S. Intelligence; ii) focusing on the most critical counterproliferation shortfalls to address major gaps in deployed capabilities (as reflected in the CINC required capabilities and the ACEs); iii) leveraging existing program funding to more rapidly field capabilities by accelerating the deliverables of DoD programs (i.e., seek the 70% solution, leave the 100% solution to longer term R&D); iv) identifying and enhancing the development of high payoff technologies to accelerate capabilities to the warfighter; v) identifying and promoting key non-materiel initiatives that

complement technological advances; and vi) transitioning Counterproliferation Support Program projects to the Services as soon as practicable. By leveraging existing sponsor funding and funding efforts with a strong and high-level military component or CINC support, the Counterproliferation Support Program seeks to expedite the transition of project development and acquisition responsibilities to the Services. The expedited acquisition process embodied in the ACTD process is ideal for achieving these objectives, and the Counterproliferation Support Program seeks to use ACTDs as the vehicle for rapid evaluation, demonstration, and fielding of new and enhanced military capabilities.

The Counterproliferation Support Program budget request for FY 1999, including support from the Office of the Deputy Under Secretary of Defense for Advanced Technology (ODUSD(AT)), is $153.4 million, up from the $104.7 million for FY 1998. This year, the Counterproliferation Support Program is focusing its investments in 6 of the 15 counterproliferation ACEs, as shown in Table 5.2. Over 80% of its FY 1999 budget is allocated in the areas of remote detection, characterization, and early warning of BW agents (DoD ACE priority 1) and detection and defeat of NBC/M and underground facilities with minimal collateral effects (DoD ACE priorities 2 and 3). Table 5.2 also compares Counterproliferation Support Program funding with the overall DoD investment in counterproliferation. For FY 1999, the Counterproliferation Support Program budget represents approximately 2.6% of DoD's total investment in counterproliferation. By focusing its budget on high payoff areas and leveraging existing programs by adding funding to accelerate project schedules and deliverables, enhancements in counterproliferation capabilities are being achieved in the near term, and, by the end of the decade, significant advancements in operational capabilities in most of the counterproliferation ACEs will be achieved.

Counterproliferation On-Line: The "CP/CBD Web Site." This Internet presence was unveiled in February 1997 as the "CP Web Site" and was later expanded to include information on the Chemical/Biological Defense Program. The newly named "CP/CBD Web Site" is located on the OSD Acquisition and Technology "ACQWeb" (or addressable directly at http://www.acq.osd.mil/cp). The main purpose of the CP/CBD Web Site is to disseminate information to U.S. citizens, Congress, and the press, but this information is also available to users worldwide. Choosing ACQWeb as the CP/CBD Web Site's host allowed the site's web spinners to leverage OSD's existing information review, dissemination, and security vehicles to meet changing consumer demands for information. The CP/CBD Web Site's Community Directory features contact information and a list of committees and organizations interacting with the office of the DATSD(NCB)(CP/CBD). Also featured is an online version of the 1996, 1997, and 1998 (pending) CPRC reports. Online versions of the 1997 and 1998 *DoD Nuclear/Biological/Chemical Defense Annual Reports to Congress* are also featured. The Research section features an updated recommended list of Internet resources related to counterproliferation and chemical/biological defense topics, a large collection of links to government and other counterproliferation-related Web sites, and a series of links to searchable archives for government and congressional records and relevant articles appearing in the mainstream press.

5.1.7 International Cooperative Efforts to Counter Proliferation. OSD/Policy is continuing to work with long-standing allies and friends in Europe, the Pacific, and Middle East

Table 5.2: Counterproliferation Support Program ACE Investments

Counterproliferation ACEs (in DoD priority order)	FY 1999 Investments [$M]	
	DoD CP Initiative	CPSP
1. Detection, Identification, and Characterization of BW Agents	228.3	48.5
2. Detection, Characterization, and Defeat of NBC/M Facilities with Minimal Collateral Effects	110.5	79.8[a]
3. Detection, Characterization, and Defeat of Underground Facilities with Minimal Collateral Effects		
4. Ballistic Missile Active Defense	3,997.4	-
5. Support for Special Operations Forces and Defense Against Paramilitary, Covert Delivery, and Terrorist NBC Threats	127.4	16.3
6. Provide Consequence Management	120.8	1.4
7. Cruise Missile Defense	-	-
8. Collection, Analysis, and Dissemination of Actionable Intelligence to Counter Proliferation	1.5[c]	-
9. Robust Passive Defense to Enable Sustained Operations on the NBC Battlefield	476.1	1.9
10. BW Vaccine RDT&E and Production to Ensure Stockpile Availability	49.1	-
11. Target Planning for NBC Targets	54.4	5.5
12. Prompt Mobile Target Detection and Defeat	125.3	-
13. Detection, Tracking, and Protection of NBC/M and NBC/M-Related Materials and Components	7.3	-
14. Support Export Control Activities of the U.S. Government	13.2	-
15. Support Inspection and Monitoring Activities of Arms Control Agreements and Regimes	600.4	-
• TOTALS:	5,911.7	153.4

[a] Includes support from ODUSD(AT).
[b] Ballistic missile defense programs also support cruise missile defense capabilities.
[c] Please see the Intelligence Annex to this report for additional information.

regions to develop common approaches for countering proliferation. ASD(S&TR) played the leading role in moving counterproliferation to the top of NATO's agenda. NATO's Senior Defense Group on Proliferation (DGP), co-chaired by ASD(S&TR) and a European ally (currently Germany), was established in 1994 to establish common views on proliferation threats, to identify the range of Alliance and national capabilities required to address these threats, and recommend improvements in NATO's defense posture to counter them. NATO's counterproliferation initiative is an integral part of the Alliance's adaptation to the post-Cold War strategic environment. As part of NATO's strategic reorientation toward security responsibilities beyond Europe, the DGP has recommended improvements in CW/BW protection of deployed allied forces operating on NATO's periphery where the military dangers posed by NBC/M proliferation are greatest. The DGP has also recommended steps to improve defenses against BW threats, which are of particular concern. In June 1996, NATO defense and foreign ministers approved a core, integrated set of capability enhancements and force improvements. In many of these areas, NATO already has, or is on the way to developing, the requisite capabilities. DGP findings are intended to give impetus and added rationale for fielding such capabilities, as well as to demonstrate how supplementing this nucleus of capabilities with other means – layered defenses against theater ballistic missile attack, special munitions for NBC agent defeat and defeat of hardened NBC

targets, computer modeling and simulation, and medical countermeasures – would strengthen the Alliance's overall ability to discourage NBC proliferation, deter the threat or use of NBC weapons, and protect against NBC attack.

Northeast Asia and the Middle East are the two regions in which the U.S. and its friends and allies are most likely to be engaged in future conflicts against CW/BW-armed adversaries. Within the Asia-Pacific region, DoD places a high priority on cooperative efforts with the Republic of Korea (ROK), since ROK and U.S. Forces/Korea face an immediate threat from North Korea's NBC weapons. OSD/Policy has offered to establish a working group on counterproliferation with the ROK to improve the ability of ROK and U.S. forces in-country to operate together in an NBC environment. OSD has also held discussions on counterproliferation with Japan and Australia. In the Middle East, OSD established a counterproliferation working group with Israel, and held counterproliferation-related discussions with Kuwait and Oman. OSD/Policy, in conjunction with U.S. Central Command, plans to address counterproliferation with its other friends and potential coalition partners in the region and has met with U.S. country teams in the Gulf Cooperation Council (GCC) states to develop its approach. The objective is to convince GCC allies to improve their overall interoperability for cooperative security by improving counterproliferation capabilities, initially focusing on theater missile defense through existing bilateral, military-to-military fora. OSD's longer-term approach is to develop a cooperative security arrangement with and among all GCC allies and to institute NBC defense indoctrination, training, and exercises into OSD's bilateral military-to-military relationships with each state.

5.1.8 Other Key Activities Associated with DoD's Counterproliferation Initiative. Several other activities and developments impacting DoD's Counterproliferation Initiative have occurred since the CPRC's May 1997 report. They are discussed below.

Vaccination of U.S. Forces Against Anthrax. In December 1997, the Secretary of Defense announced the decision to systematically vaccinate all active and reserve U.S. military personnel against anthrax. This decision is crucial for protecting U.S. forces against the most commonly weaponized BW threat. The Food and Drug Administration (FDA)-approved schedule requires a six-dose regimen spaced out over the course of 18 months, with an annual booster to maintain immunity. The Secretary of Defense directed that the following conditions must be met before vaccination starts: i) supplemental testing on all vaccine lots currently in stockpile, consistent with FDA standards, to assure sterility, potency, and purity of the vaccine; ii) implementation of an automated system for fully tracking personnel who receive the vaccinations; iii) approval by the Assistant Secretary of Defense for Health Affairs of operational plans to administer the immunizations and of communications plans to inform military personnel of the program; and iv) review of health and medical issues of the program by an independent expert. Plans currently call for all DoD personnel serving in high threat regions to receive vaccinations first. Total force vaccination will follow according to a DoD policy currently being staffed. Currently, the only FDA-licensed producer of the anthrax vaccine is the Michigan Biologic Products Institute in East Lansing, Michigan.

Science and Technology Strategic Planning for Counterproliferation. The 1998 *Joint Warfighting Science and Technology Plan* (JWSTP) provides a Joint science and technology

(S&T) perspective across the Services and Defense Agencies for the purpose of assuring that the DoD S&T program adequately supports high-priority Joint Warfighting Capability Objectives (JWCOs). The JWSTP emphasizes Advanced Technology Demonstrations (ATDs) and ACTDs that transition innovative concepts and mature technologies to the warfighter faster and more cost effectively than traditional acquisition mechanisms. "Chemical/Biological Warfare Defense and Protection" and "Counter Weapons of Mass Destruction" are two of the 10 JWCOs addressed in the 1998 JWSTP. The JWSTP also highlights technology development efforts in the areas of NBC contamination avoidance, point detection, early warning, individual and collective protection, and decontamination. Counterproliferation-related ATDs and ACTDs in the areas of NBC passive defense and counterforce are also described in the JWSTP. The 1998 JWSTP and JWCO-supportive elements of the DoD S&T program continue to receive funding priority in the President's Budget and DoD's FYDP.

The Air Force Counterproliferation Master Plan. As a result of collaboration on the Joint *Missions and Functions Study*, the Air Force developed a comprehensive Master Plan for Counterproliferation, which supports OSD and CINC objectives and tasking. It details the Air Force's strategy as a force developer and provider by assessing capabilities, defining Air Force counterproliferation requirements to support the warfighting CINCs, identifying shortfalls and deficiencies in all areas of the counterproliferation mission, and prescribing measures to correct them. The Air Force Master Plan became the model for an OSD initiative to create an overall DoD Counterproliferation Master Plan.

Air Force Integrated Process Teams. In response to the passive defense-related recommendations derived from the Air Force's major counterproliferation study in 1996, entitled *The Effects of Chemical and Biological Warfare on Air Base Combat Operations,* the Air Force established the NBC Ability-to-Survive-and-Operate IPT. In May 1997, this IPT conducted a bottom-up review of Air Force passive defense issues and established a rigorous work program. To integrate the IPT's passive defense work with the overall Air Force effort to operationalize counterproliferation throughout the Air Force, the Counterproliferation IPT was established. The Counterproliferation IPT was the "single manager" with the responsibility for integrating, facilitating, and coordinating the collective Air Force response to the CW/BW challenge – encompassing passive and active defenses, counterforce and intelligence, and surveillance and reconnaissance functional areas. In the summer of 1997, the Counterproliferation IPT was combined with the Nuclear IPT to form the Nuclear and Counterproliferation IPT to consolidate and streamline Air Force efforts in the counterproliferation area.

The Air Force Counter Chemical and Biological Warfare Roadmap. In order to more effectively articulate Air Force programmatic needs for counterproliferation, and to facilitate corporate Air Force decision-making, the Air Force has undertaken development of a *Counter Chemical and Biological Warfare Roadmap.* The roadmap describes and prioritizes strongly related and unique Air Force counterproliferation programs and projects. The results will be used by the Air Force in FY 2000 POM deliberations and will serve as an input to the submission of the Air Force Major Commands. The roadmap will be regularly updated.

5.2 Status and Accomplishments of DoD Proliferation Prevention Activities and Programs

5.2.1 Relevant Counterproliferation ACEs and DoD Policy Perspectives for Proliferation Prevention. DoD's role in proliferation prevention involves working with DOE and U.S. Intelligence to identify candidate proliferants before they can acquire or expand their NBC/M capabilities (DoD ACE priorities 8 and 13); supporting U.S. government export control activities (DoD ACE priority 14); providing inspection, monitoring, implementation, and verification support for arms control treaties and regimes (DoD ACE priority 15); and, if so directed by the National Command Authority, planning and conducting interdiction missions to thwart proliferation activities (DoD ACE priorities 2, 3, 5, and 11).

5.2.2 Counterproliferation Support Program Projects in Proliferation Prevention. The Counterproliferation Support Program supports ATSD(NCB)'s Deputy for Nuclear Matters in continuing efforts to support DoD's oversight of DOE's nuclear stockpile stewardship responsibilities, the Nuclear Weapons Council and other senior advisory groups, policy formulation for operational nuclear weapons safety and control, and management activities associated with DoD nuclear stockpile responsibilities. ATSD(NCB)'s responsibilities in these areas extend well beyond counterproliferation issues and would have to be borne even in the absence of the Counterproliferation Support Program. The status of these projects is summarized below and additional details are provided in Table 5.3 and in Appendix C (Table C.1).

5.2.3 DoD Proliferation Prevention Programs Strongly Related to Counter-proliferation. Several OSD, DoD agency, and Service programs are also addressing counterproliferation ACEs in proliferation prevention. These programs are described below and in Appendix C which provides additional details on program accomplishments and milestones. Joint DoD and U.S. Intelligence activities and programs in proliferation prevention are discussed in the Intelligence Annex.

The Cooperative Threat Reduction (CTR) Program. Several ongoing projects under the CTR Program, managed by ATSD(NCB)'s Deputy for Cooperative Threat Reduction (DATSD(NCB)(CTR)), play a major role in proliferation prevention. Under the CTR Program, DoD assists states of the FSU to: i) destroy, transport, store, disable, and safeguard WMD and related materials and components; ii) establish verifiable safeguards against their proliferation; iii) facilitate the demilitarization of defense industries and conversion of military technologies and capabilities to civilian purposes; iv) expand military-to-military contacts between the U.S. and FSU states; and v) support International Science and Technology Centers to aid in transitioning former FSU weapons scientists to peaceful endeavors. DATSD(NCB)(CTR) works closely with DOE in these matters. (See Section 6.2.5.)

Key accomplishments include: i) helping Ukraine, Belarus, and Kazakhstan become non-nuclear weapons states; ii) delivering 115 rail car conversion kits and 150 "supercontainers" to enhance physical security of nuclear weapons and warheads during transit; iii) delivering urgent physical security upgrades for Russian nuclear weapons storage sites; iv) making significant progress on Phase I construction of the Fissile Material Storage Facility at Mayak, Russia; v) eliminating 84 submarine launched ballistic missile (SLBM) launchers and dismantling 255 Intercontinental Ballistic Missiles (ICBMs) and 37 heavy bombers; vi) closing and sealing 117 of

194 nuclear weapons test tunnels and bore holes at Kazakhstan's Degelen Mountain test tunnel complex; vii) amending the DoD-President's Committee agreement for CW destruction assistance to include former CW production facility dismantlement assistance; viii) delivering three mobile chemical analytical laboratories in support of CW destruction activities; ix) establishing 17 joint venture partnerships between U.S. companies and FSU defense enterprises formerly associated with WMD production; x) re-employing over 15,000 former Soviet weapons scientists and engineers on peaceful, civilian projects; xi) conducting 44 facility audits and examinations of CTR assistance activities through January 1998; and xii) funding 177 exchanges between U.S. and FSU defense establishments. Additional details for these programs are provided in Table 5.3 below and in Appendix C (Table C.10).

OSD Critical Technology Support Program. This program develops and publishes the Congressionally mandated *Militarily Critical Technologies List (MCTL),* a detailed and structured compendium of the technologies DoD assesses as critical to maintaining superior U.S. military capabilities. It applies to all mission areas including counterproliferation. The program is managed by the Deputy Under Secretary of Defense for International and Commercial Programs through the Deputy Director for Technology Planning and Export Control. Part I of the MCTL, *Weapons Systems Technologies*, includes technologies whose technical performance parameters are at or above the minimum level necessary to ensure continuing superior performance of U.S. military systems. Part II, *Weapons of Mass Destruction Technologies,* addresses technologies required for the development, integration, or employment of NBC weapons and their means of delivery. Part III, *Developing Critical Technologies,* covers technologies that will enhance U.S. military systems with increasingly superior military performance or maintain a superior capability more affordably. The MCTL provides technical guidance for U.S. export control proposals, for licensing and export control officials, and for intelligence collection. Technologies that a proliferant might use and that might need to be countered are addressed in Part II. Parts I and III cover those technologies that U.S. forces could use to thwart an NBC weapons program or fight in an NBC-contaminated environment. Technology working groups made up of experts from the U.S. government, academia, and industry review and update the MCTL regularly to ensure key technologies are included and, thereby, identify new technologies applicable to counterproliferation. The MCTL is available on the Internet through the Defense Technical Information Center. Users can interact with the technology working groups, recommend changes, and volunteer to serve on a working group on-line. Additional project details are provided in Table 5.3 and in Appendix C (Table C.9).

On-Site Inspection Agency Programs. OSIA is responsible for several activities associated with countering proliferation. The OSIA is a Joint Service DoD organization responsible for implementing inspection, escort, and monitoring requirements under the verification provisions of several U.S. international arms control treaties and confidence-building agreements involving NBC/M. Key accomplishments related to nuclear and chemical weapons arms control treaties and agreements include: i) providing technical advisory support activities for the CTBT Interagency Backstopping Group and the U.S. Delegation to the CTBT Preparatory Commission; ii) providing expertise on-site inspection to the CTBT Verification Monitoring Task Force On-Site Inspection Subgroup; iii) supporting the INF Treaty, now in its 10th year; iv) supporting the Strategic Arms Reduction Treaty (START I), now entering its 4th year; v) planning and preparation for verification operations in support of START II ratification; vi) maintaining a

capability to monitor Russian nuclear tests under the auspices of the Threshold Test Ban Treaty (TTBT) and the Peaceful Nuclear Explosion Treaty; and vii) supporting implementation of the CWC, through successful initial inspections at declared U.S. CW production, storage, and Schedule 1 facilities and continuous monitoring at U.S. CW destruction facilities. OSIA's support of the Plutonium Production Reactor Agreement (PPRA) focuses on monitoring Russian cessation of the production of weapons-grade plutonium. The agency supports DoD and DOE in PPRA talks with the Russian Federation at the Joint Implementation Compliance Committee.

OSIA also serves as the executive agent in support of a number of DoD counterproliferation programs. The agency is the executive agent for DoD in support of the UNSCOM on Iraq. OSIA has the authority, consistent with the UN Participation Act, Executive Order 10206 and applicable DoD directives, to direct DoD components to procure or provide personnel, services, facilities, supplies, equipment, and other assistance from DoD stores. OSIA is also the executive agent for the DoD/FBI and DoD/U.S. Customs Service counterproliferation programs which are designed to train and equip law enforcement and border enforcement officials to deter, detect, prevent, and investigate the proliferation, acquisition, transfer, and transit of NBC/M and related materials in Eastern Europe, the Baltic countries, and the states of the FSU. The DoD/FBI Counterproliferation Program focuses on training a professional cadre of law enforcement personnel in each participating country. Highlights since last year's report include completion of three NBC counterproliferation training sessions for Kazakhstani, Uzbekistani, and Kyrgyzstani law enforcement officials at the International Law Enforcement Academy in Budapest, Hungary. The DoD/U.S. Customs Service Counterproliferation Program provides training and technical assistance to border enforcement authorities. This training focuses on training mid- and upper-level customs and border guard officials on interdiction techniques, procedures, and use of low and high tech equipment that supports interdiction of NBC/M and NBC/M-related materials. Additional OSIA project details are provided in Table 5.3 below and in Appendix C (Table C.11).

The Nuclear Treaty Program Office and CTBT Implementation. The ATSD(NCB) Deputy for Nuclear Treaty Programs (DATSD(NCB)(NTP)) oversees the integrated, DoD-wide CTBT implementation, monitoring, and compliance program, which includes: i) implementation of International Monitoring System (IMS) stations on U.S. territory or for which the U.S. has responsibility under the treaty; ii) cooperative bilateral IMS installation projects; iii) development of the prototype International Data Center (IDC) and a National Data Center to collate CTBT-related data; iv) transition of the prototype IDC to its permanent location at the headquarters of the CTBT Organization in Vienna; v) R&D activities in nuclear test monitoring techniques satisfying congressional requirements and presidential safeguards; and vi) treaty implementation and technical support. Key accomplishments since last year's report include: i) continued development of the global continuous threshold monitoring network and the CTBT data fusion knowledge base; ii) continued data collection, storage, fusion, and distribution technology for the IDC; and iii) advancement of IDC transition from phase I to phase II, which includes the procurement by the Provisional Technical Secretariat of the first batch of hardware and transfer of first generation software. Additionally, the Nuclear Treaty Programs Office provides technical support and oversight for DoD-wide programs required for the negotiation, planning, implementation, compliance, and monitoring of the nuclear Nonproliferation Treaty, enhanced IAEA safeguard measures, and a future Fissile Materials Cut-off Treaty.

DSWA Nuclear Arms Control/CTBT Technology Support Program. This consolidated research, development, test, and evaluation (RDT&E) program develops capabilities and technologies, under the oversight of the Deputy for Nuclear Treaty Programs, to support the preparation, implementation, compliance, and verification of the CTBT. DSWA serves as program manager for DATSD(NCB)(NTP)'s CTBT Implementation Program described above. DSWA assists DATSD(NCB)(NTP) on bilateral programs to exchange data and conduct calibration studies in support of the CTBT. Additional project details are provided in Table 5.3 and in Appendix C (Table C.8).

DSWA Chemical Biological Arms Control Technology (CB ACT) Program. DSWA's CB ACT office has the lead within DoD for developing the technologies required to implement chemical and biological arms control treaties and agreements. The CB ACT office conducts RDT&E activities to meet DoD-identified treaty implementation, verification, monitoring, and inspection needs. The CB ACT program is working to protect U.S. national security interests, improve the effectiveness of U.S. verification efforts, assist in meeting U.S. legal obligations imposed by treaty provisions, support U.S. policy development, minimize inspection and implementation costs, and enhance personal safety during treaty inspections. DSWA's designation as a combat support agency adds an important additional focus of considering the impact of CW/BW arms control agreements on warfighting commanders and their missions.

The current CB ACT program concentrates on the following six activities: i) *Support to Negotiations*, including CWC compliance and implementation, bilateral arms control exchange visits, Biological Weapons Convention (BWC) Review Conferences and exchange visits to military biological facilities under the auspices of the U.S./United Kingdom/Russia Trilateral Statement; ii) *Compliance Support/Data Management*, by supporting the development of DoD data and notification management systems consistent with treaty and international agreement reporting provisions, such as the CWC Information Management System, the Chemical Agent Management Information Network, and a proposed BWC data management system; iii) *Personnel Safety Monitoring*, by developing a real-time portable CW agent monitor for detecting trace levels of volatile CWC-scheduled chemicals to assure that inspectors, escorts, and facility personnel are not exposed to chemical hazards; iv) *Off-Site Monitoring*, by evaluating technologies for use in monitoring the perimeter of facilities undergoing CWC challenge inspections; v) *Non-Destructive Evaluation*, by developing state of the art technologies for non-invasive characterization of the contents of munitions and containers; and vi) *On-Site Analysis*, by providing state-of-the-art sample collection, screening, preparation, and determinative analysis methods and equipment integrated into a field portable system that supports the Senate's ratification provision for in-territory sampling and analysis, consistent with CWC treaty obligations. Additional project details are provided in Table 5.3 and Appendix C (Table C.8).

DSWA Strategic Arms Control Technology Program. This program supports counterproliferation by supporting U.S. government implementation and compliance with strategic arms control treaties. The program undertakes the RDT&E activities required to provide the capabilities needed to conduct monitoring, inspections, and data exchanges under START I and II; the Missile Technology Control Regime (MTCR); the Safeguards, Transparency and Irreversibility Agreement; the Anti-Ballistic Missile (ABM) treaty; and the INF treaty. It also assists the U.S. government and industry in complying with the treaties and in developing technologies to meet

Table 5.3: Key DoD Counterproliferation Activities and Programs in Proliferation Prevention

Program/Project Title	Project Description	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
CP Support Program					
• Nuclear Matters Projects	• Assessments of reliability, safety, surety, and sustainability of the nuclear stockpile	5, 2, 3	ATSD (NCB)	2.012	605160BR
Strongly Related CP Programs					
• CTR Programs	• Assisting FSU states in destroying, controlling, and demilitarizing WMD and associated infrastructure	15, 13	ATSD (NCB)	442.400	FSU Threat Reduction
• OSD Critical Technology Support Program	• Preparation of the *Militarily Critical Technologies List* to support export control activities	14	DUSD (ICP)	2.618	605110T
• OSIA Programs	• Implementation of inspection, escort, monitoring, and treaty verification measures for nuclear weapons arms control treaties and agreements	15, 14, 13	OSIA	35.112	O&M
	• Support for CW/BW agreements			34.597	O&M
	• DoD/FBI Counterproliferation Program			1.767	O&M
	• DoD/U.S. Customs Counterproliferation Program			2.720	O&M
	• CTBT technical advisory support			1.660	O&M
	• Support for plutonium agreements			0.580	O&M
	• Support for UNSCOM operations in Iraq			5.515	O&M
• DSWA Nuclear Arms Control/CTBT Technology Support Program	• RDT&E of technologies to support CTBT implementation, compliance, and verification	15	DSWA	35.300	603711BR
	• Enhanced nuclear safeguards			1.900	O&M
• DSWA Chemical Biological Arms Control Technology Program	• RDT&E in implementation, verification, monitoring, and inspection support for CW/BW arms control initiatives, including the CWC and BWC	15	DSWA	10.542	603711BR
• DSWA Strategic Arms Control Technology Program	• RDT&E of technologies to enable verification of START and follow-on nuclear weapons treaties	15, 13	DSWA	9.378	603711BR
• USAF Nuclear Detonation Detection System	• Integrates and supports nuclear detonation detection sensors on GPS satellites; develops and procures ground system for nuclear detonation reporting	15	Air Force	23.400	305913F
• Navy SEI System Support Program	• Procurement and fleet integration of SEI system upgrades to aid in tracking NBC/M-related shipments	13	Navy	2.360	204575N
				0.430	O&M

requirements of future strategic arms control agreements. Systems, equipment, and procedures have been developed and made operational to exchange data, accommodate inspections of U.S. facilities, and enable the U.S. to exercise all of its treaty rights. A capability to evaluate developed systems, equipment, and procedures is maintained, as well as a capability to assess their suitability under future arms control regimes. In addition, support to the treaty commissions (e.g., the Joint Compliance and Inspection Commission) continues to resolve technical issues, assist in developing the appropriate implementing documents, and evaluate the compliance of U.S. development and testing programs with the various strategic arms control treaties. Technology development projects are under way to support anticipated future treaty requirements in the most non-intrusive and cost-effective manner. Future strategic arms control regimes may consider non-deployed missiles and warheads in all phases of their life cycles, to include conversion and/or elimination, and will require the development of new procedures and equipment to accomplish the

monitoring task. Major areas of concentration include warhead accountancy, monitoring and inspection, and data exchanges. Key accomplishments in support of these areas include the identification of several viable technologies for non-intrusive detection and identification of nuclear weapons and their components, the completion of the Authenticated Tracking and Monitoring System for global tracking of critical items during shipment, and expansion of the START Central Data System for START II reporting requirements. Additional project details are provided in Table 5.3 and in Appendix C (Table C.8).

Air Force Nuclear Detonation Detection System. This program provides the capability to detect endo- and exoatmospheric nuclear detonations worldwide. Key accomplishments include integration of nuclear detonation phenomenology sensors on Global Positioning System (GPS) Block IIR satellites and testing of ground processing and display system software and hardware. Additional project details are provided in Table 5.3 and in Appendix C (Table C.5).

Navy Specific Emitter Identification Support Program. A Specific Emitter Identification (SEI) prototype system to improve Navy capability to identify and facilitate the tracking of ships at sea suspected of transporting NBC/M and related materials has been successfully deployed. The SEI program has transitioned from the Counterproliferation Support Program to the Navy, and the Navy will continue to integrate SEI into the fleet by upgrading existing signal processors. Fleet integration is scheduled for FY 1999. Additional project details are provided in Table 5.3 and in Appendix C (Table C.4).

5.2.5 Near-, Mid-, and Long-Term Milestones for DoD Proliferation Prevention Programs. Figure 5.1 summarizes the time-phased milestones of the key proliferation prevention activities and programs discussed above.

5.3 Status and Accomplishments of DoD Strategic and Tactical Intelligence Activities and Programs

5.3.1 Relevant Counterproliferation ACEs and DoD Policy Objectives in Strategic and Tactical Intelligence. The principal focus of DoD intelligence activities is to provide proliferation-related information that is clear, accurate, and timely enough to support the needs of the military commanders (DoD ACE priority 8). These activities include DoD support to the national strategic intelligence effort down to providing the soldier in the field with tactical intelligence specifically related to his immediate situation. DoD works closely with U.S. Intelligence to perform these activities. The Counterproliferation Support Program is making contributions in this area as well. These projects are summarized in Table 5.4 below and in Appendix C. A more thorough description of how DoD intelligence activities support counterproliferation policy and strategy objectives may be found in the Intelligence Annex to this report

5.3.2 New DoD Initiatives in Strategic and Tactical Intelligence. See the Intelligence Annex to this report.

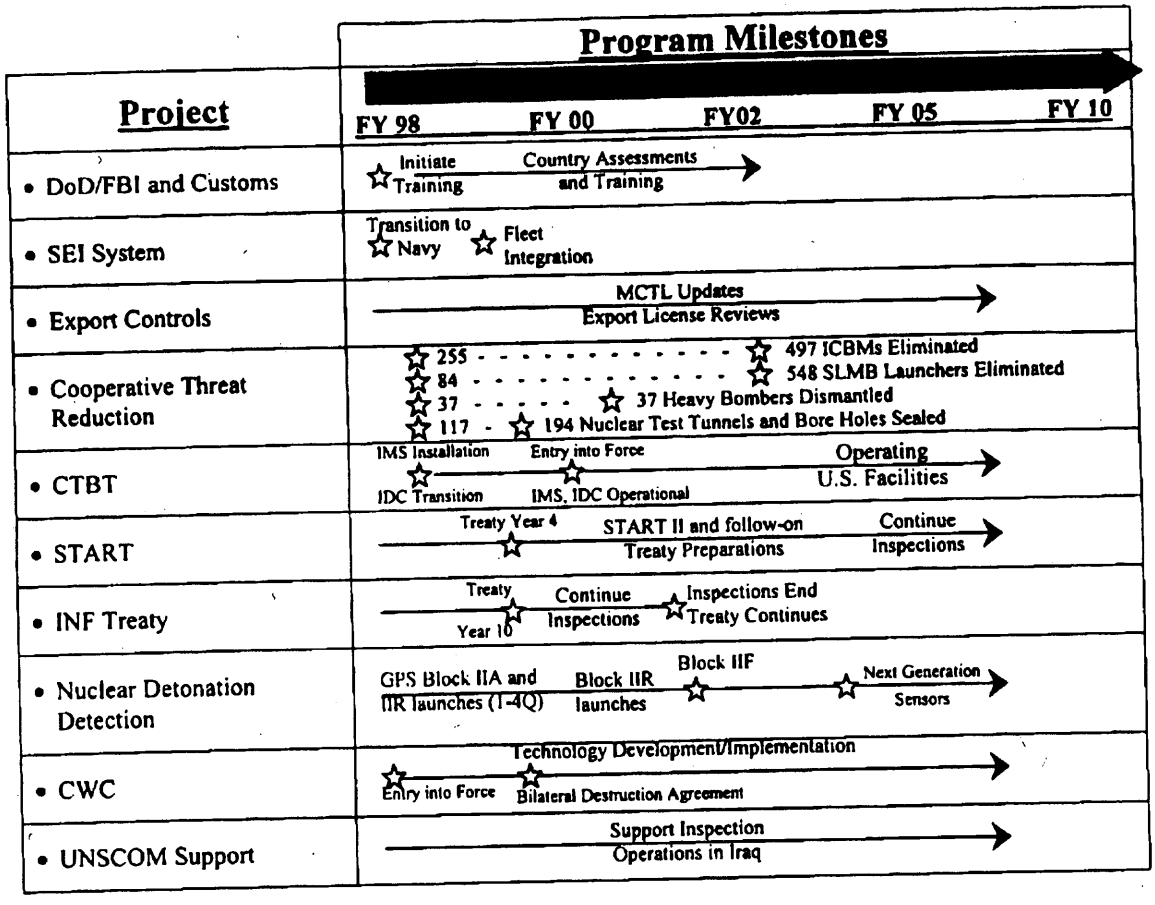

Figure 5.1 Time-Phased Milestones of Proliferation Prevention Programs

5.3.3 Counterproliferation Support Program Projects in Strategic and Tactical Intelligence. Two Counterproliferation Support Program projects in the proliferation prevention and battlefield surveillance functional areas are relevant to strategic and tactical intelligence. The Tactical Unattended Ground Sensor (TUGS) and the airborne tactical Forward Looking Infrared (FLIR) sensor is being developed for NBC/M and underground facility surveillance, characterization, and BDA. These projects are described in subsection 5.4.2.

The High Frequency Active Auroral Research Program (HAARP). HAARP is exploring the use of low-frequency electromagnetic waves for detecting and imaging underground structures and tunnels. This program had not been considered a high priority by the Administration and was not included in its FY 1998 budget request. However, Congress provided funding for the Counterproliferation Support Program to work with the Air Force Research Laboratory to expedite determination of the viability and military utility of the HAARP concept. A workshop entitled, "Long-wave Radio Frequency Imaging of Underground Structures," held in May 1997, provided government organizations and potential contractors with an overview of this research area and was the basis of an industry solicitation released in June 1997. Several efforts related to underground facilities imaging were conducted in 1997, and additional programs are scheduled for 1998. A research effort for detecting underground structures has been initiated. The HAARP transmitter is

Table 5.4: Key DoD Counterproliferation Activities and Programs in Strategic and Tactical Intelligence

Program/Project Title	Project Description	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
CP Support Program • HAARP Program	• Single source transmission of long wavelength electromagnetic waves for underground structure detection and imaging	3, 8	ATSD/ (NCB) Air Force	0*	603160BR
• Battlefield Surveillance Projects	• TUGS and FLIR systems RDT&E	(See Section 5.4.2)			
Strongly Related CP Programs • Air Force HAARP Support	• Hardware development and operational support	3, 8	Air Force	0*	602601F
• Space Based Infrared System	• Space based sensors supporting ballistic missile launch warning, technical intelligence, and battlespace characterization mission areas	(See Section 5.6.4)			
• LIDAR Remote Optical Sensing Technology Program	• Aircraft-based long range LIDAR for remote sensing of NBC weapon production signatures	8, 1	Air Force DIA	1.502	602601F
• Joint DoD/U.S. Intell. Programs	• See Intelligence Annex	(See Intelligence Annex)			

* Currently, no DoD FY 1999 funds are requested for this Congressional Special Interest Program.

being upgraded, and a demonstration of the facility's underground imaging capabilities is being planned for 1999. No FY 1999 DoD funding is currently budgeted for this Congressional Special Interest Program. Additional program details are provided in Table 5.4 and in Appendix C (Tables C.1 and C.5).

5.3.4 Strategic and Tactical Intelligence Activities and Programs Strongly Related to Counterproliferation. Two Air Force programs support this mission area. Additional DoD strategic and tactical intelligence programs strongly related to countering proliferation are described in the Intelligence Annex to this report.

The Air Force Space Based Infrared System (SBIRS). SBIRS is a replacement for the Defense Support Program space based early warning system and consists of a space segment of geosynchronous, highly elliptical, and low earth orbit spacecraft and an associated ground segment. SBIRS addresses the mission areas of strategic and theater missile launch warning, national and theater missile defense, technical intelligence collection, and battlespace characterization. SBIRS is also applicable to active defense activities and programs and is covered with greater detail in Section 5.6.4.

The Air Force Remote Optical Sensing Technology Program. This program is developing various LIDAR (light detection and ranging) and laser radar related technologies that can be used for a variety of applications, including: stand-off detection of the production, storage, and use of NBC weapons; battle damage assessment; surveillance; and interrogation of production facility or other target effluent emissions. The principal technologies are frequency agile laser sources and differential absorption LIDAR data processing. Additional project details are provided in Table 5.4 and in Appendix C (Table C.5).

5.4 Status and Accomplishments of DoD Battlefield Surveillance Activities and Programs

5.4.1 Relevant Counterproliferation ACEs and DoD Policy Objectives for Battlefield Surveillance. In the battlefield surveillance area, DoD is improving capabilities to detect, identify, and characterize NBC/M forces and associated infrastructure elements in a timely manner to support targeting, mission/strike planning, counterforce operations, and prompt post-strike BDA activities. Emphasis is on: detection, characterization, BDA, and collateral effects monitoring of underground and surface NBC/M facilities (DoD ACE priorities 2, 3, and 8); focused target planning activities for NBC/M facilities (DoD ACE priority 11); and continuous wide-area surveillance and mobile target detection, particularly NBC-armed mobile missile launchers (DoD ACE priorities 8 and 12). (Programs involving the detection and identification of NBC agents are discussed under the passive defense functional area, Section 5.7.) This effort is being coordinated with U.S. Intelligence; the details of which are provided in the Intelligence Annex.

5.4.2 Counterproliferation Support Program Projects in Battlefield Surveillance. The Counterproliferation Support Program is supporting several projects in this area, including: i) development of enhanced sensor technologies, including the TUGS and the Tactical FLIR Pod Modification (TFPM) projects, for NBC/M target surveillance, characterization, BDA, and collateral effects assessment; ii) development of tactical multi-sensor data fusion techniques and signature collection to support underground target characterization and BDA; iii) integration of NBC/M target characterization, BDA, and collateral effects sensors into unmanned aerial vehicles (UAVs); and iv) integrated operational testing of these systems, as part of the Counterproliferation ACTDs (see subsection 5.5.2), to support the rapid fielding of integrated battlefield surveillance and counterforce capabilities. The DOE National Laboratories are also providing technology R&D and technical support for the TUGS project.

Key accomplishments since last year's report include: i) developed design options for the TFPM, initiated proof-of-principle demonstrations of system modifications, collected imagery to improve and support weapon delivery testing, and produced and flight tested ACTD hardware; ii) constructed and field tested a brassboard TUGS system; iii) continued data collection from representative NBC/M facilities during weapon detonations to evaluate TUGS performance and demonstrate utility; and iv) produced twelve TUGS units for ACTD use and fielded units for pre-ACTD target characterization. Additional project details are provided in Table 5.5 and in Appendix C (Table C.1).

5.4.3 Battlefield Surveillance Activities and Programs Strongly Related to Counterproliferation. These programs are described in the Intelligence Annex to this report.

5.4.4 Near-, Mid-, and Long-Term Milestones in DoD Battlefield Surveillance Programs. Figure 5.2 summarizes the time-phased milestones of the battlefield surveillance programs discussed above, which are part of the ongoing Counterproliferation (CP1) ACTD. Additional program milestone information may be found in the Intelligence Annex to this report.

Table 5.5: Key DoD Counterproliferation Activities and Programs in Battlefield Surveillance

Program/Project Title	Project Description	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
CP Support Program					
• TUGS	• Continuous surveillance, target characterization, and BDA of NBC/M and underground facilities	2, 3, 8	DSWA DOE	3.400	603160BR
• Tactical FLIR Pod Modification (TFPM)	• Improved BDA of NBC/M and underground facilities	2, 3, 8	DSWA Air Force	5.408	603750D
• UAV-Based Collateral Effects Assessment Sensors	• Standoff/remote chemical sensor on Predator UAV • Point chemical sensor on expendable mini-UAV	2, 3, 8	DSWA NRL USAF	12.450	603160BR
• Tactical Multi-Sensor Data Fusion	• RDT&E to support target characterization and BDA of NBC/M and underground facilities	2, 3, 8, 11	DSWA	0.250	603750D
Strongly Related CP Programs					
• Joint DoD/U.S. Intell. Programs	• See Intelligence Annex	(See Intelligence Annex)			

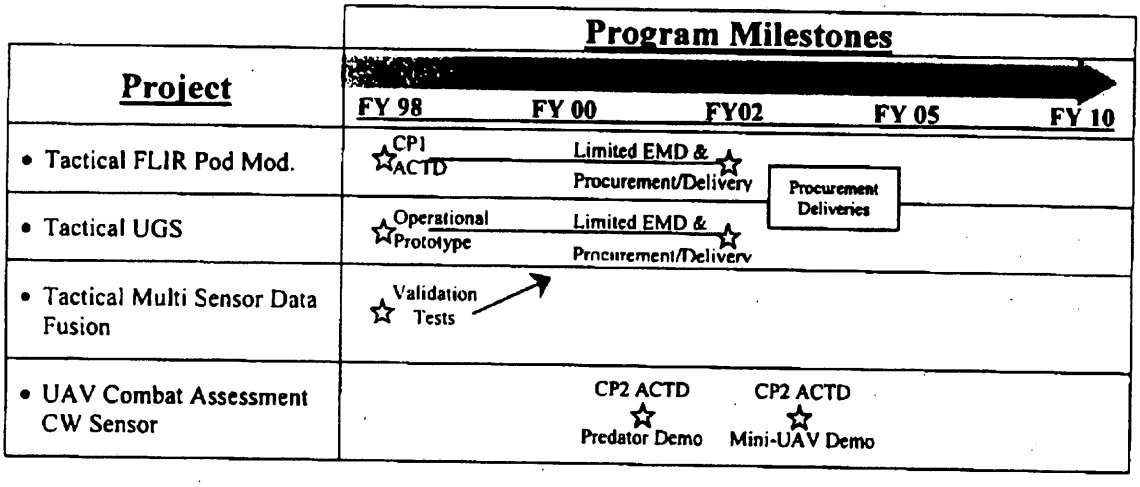

Figure 5.2 Time-Phased Milestones of Battlefield Surveillance Programs

5.5 Status and Accomplishments of DoD NBC/M Counterforce Activities and Programs

5.5.1 Relevant Counterproliferation ACEs and DoD Policy Perspectives. In the NBC/M counterforce area, DoD is working to improve capabilities to defeat NBC/M threats before they can be used against U.S., allied, and coalition forces. Service resources are being devoted to maintaining U.S. forces at the highest state of readiness to enable a quick and effective response in regional contingencies throughout the world. Resources are targeted on improving battlefield surveillance and counterforce capabilities to find and destroy NBC/M forces and their supporting infrastructure elements while minimizing collateral effects. Emphasis is on defeating NBC/M facilities, including hardened surface and underground facilities, while minimizing associated collateral effects (DoD ACE priorities 2 and 3). Projects involving advanced weapons for NBC/M target defeat that minimize or mitigate collateral effects are under way as are programs

to better understand NBC/M target vulnerability/response and collateral effects phenomenology (DoD ACE priority 11). Detection, tracking, and defeat of mobile NBC/M targets, especially mobile ballistic and cruise missile launchers and their support elements, are also key counterforce areas (DoD ACE priority 12). Sensors under development provide enhanced target detection and characterization, improved BDA and collateral effects monitoring, and more efficient restrike planning (DoD ACE priorities 2, 3, 8, 12).

5.5.2 Counterproliferation Support Program Projects in NBC/M Counterforce. The centerpiece of the Counterproliferation Support Program's NBC/M counterforce activity is the CP1 ACTD, which is nearly complete, and the recently initiated CP2 ACTD. These ACTDs are jointly sponsored by DSWA and CINC U.S. European Command (USEUCOM) and support the rapid fielding of several new NBC/M counterforce capabilities through integrated operational testing of advanced technology prototype weapons, sensors, and target planning tools. The overall objective of the Counterproliferation ACTDs is to develop, demonstrate, and deliver to the CINCs counterforce capabilities to hold NBC/M targets at risk while minimizing collateral effects. The CP1 ACTD is focusing on the delivery of advanced operational capabilities to defeat soft and hard (shallow buried) NBC/M targets by direct attack. The CP2 ACTD will provide enhanced NBC/M counterforce capabilities for standoff attack with a focus on combat assessment. The primary objectives for FY 1998 are to demonstrate ACTD readiness by completing verification tests for all residual elements of the CP1 ACTD and conduct the final CP1 ACTD demonstration.

The CP1 Counterforce ACTD. Projects supporting the CP1 ACTD include: i) developing sensor systems for target characterization and BDA (including TUGS, TFPM, and the tactical multi-sensor data fusion project described in subsection 5.4.2); ii) improving the understanding of and developing hazard prediction models for collateral effects release and transport phenomenology; iii) improving the state of knowledge in weapons effects and NBC/M target vulnerability and response; iv) developing an Advanced Unitary Penetrator (AUP), the BLU-116, for hard and underground target defeat; v) developing the Hard Target Smart Fuze (HTSF) to enhance the lethality of penetrating weapons against hard and underground targets; vi) developing the inertial terrain-aided guidance (ITAG) all-weather weapon guidance package designed to be compatible with existing munitions; vii) developing the Munitions Effectiveness Assessment (MEA) and the Integrated MEA (IMEA) targeting tools to assist in targeting, weaponeering, and strike planning against NBC/M facilities; and viii) integrated operational testing, as part of the Counterproliferation ACTD demonstrations, to support rapid user assessment and fielding of these new capabilities. The DOE National Laboratories are also providing technical support to the TUGS and ITAG projects. Key accomplishments in counterforce projects since last year's report include: i) delivery of IMEA version 3.0 to support Phase II ACTD demonstrations; ii) completion of BLU-116 AUP flight clearances and live drops with the HTSF using Air Force and Navy aircraft; iii) fabrication of ITAG units and flight testing, development of mapping processes, and F-15E fit checks; iv) fabrication of the first 12 TUGS, completion of communication link tests, and deployment to the Phase II target structure for verification and target characterization; v) verification testing and integration of the TFPM into the Low Altitude Navigation and Targeting Infrared for Night (LANTIRN); and vi) delivery, demonstration, and training on the tactical multi-sensor data fusion software. As a result of successes in this ACTD, additional weapon systems are being procured in FY 1999. Counterproliferation Support Program projects in NBC/M counterforce are further summarized in Table 5.6 and in Appendix C (Table C.1).

The CP2 Counterforce ACTD. The ongoing CP1 ACTD is establishing a new baseline for military counterforce capabilities against NBC/M facilities using direct-strike weapons. The CP2 ACTD, approved for an FY 1998 start, will address the CINC-prioritized shortfalls in standoff capability against NBC/M-related facilities. It will be completed by the fourth quarter of FY 2003. Based on CP1 ACTD successes to date, CINC USEUCOM agreed to sponsor the CP2 ACTD. In addition, the U.S. Strategic Command (USSTRATCOM) will be a participating CINC for the development of target planning and decision support tools. The selection of maturing technologies to be evaluated and demonstrated during the CP2 ACTD was based on potential military utility in meeting the high priority CINC counterproliferation required capabilities. The following capabilities are included in the CP2 ACTD: i) standoff precision delivery and improved penetration and fuzing capabilities by modifying existing or developing weapon systems; ii) improved counterforce planning and decision support tools; iii) improved combat assessment capabilities through improved detection and prediction of collateral effects and improved collection of BDA information; iv) enhanced intelligence support by improving information dissemination, target characterization, and target functional/nodal analysis; and v) alternative weapon payloads to mitigate collateral effects. Additional weapon systems procurement is planned for FY 1999.

5.5.3 NBC/M Counterforce Programs Strongly Related to Counterproliferation. Service and DoD Agency programs are also addressing counterproliferation ACEs in NBC/M counterforce. These programs are described in this subsection.

Hard and Deeply Buried Target Defeat Capability (HDBTDC) Integrated Product Team. This Joint Service, JROC and USD(A&T)-approved effort is developing non-nuclear weapon concepts to defeat hard and deeply buried targets. It was established in response to Mission Need Statements from USSTRATCOM and the Air Combat Command. The Air Force is the lead Service, with participation from the other Services, the Joint Staff, DSWA, OSD, DoD and DOE laboratories, and DIA. The effort is managed by an IPT (chaired by OSD) and a Senior Officers Steering Group (co-chaired by the Air Force and OSD). The program is in the "Concept Exploration and Definition" phase of the DoD acquisition process, and its objective is to develop weapons capable of holding at risk those highest priority assets essential to an adversary's warfighting ability – assets that are heavily defended and protectively hardened. Mission effectiveness criteria include the ability to deny, disrupt, or destroy these high priority targets by means of a wide-range of possible defeat mechanisms, including functional kill. Key targets include hardened, deeply buried, and tunnel complexes housing NBC weapon production, storage, and operational assets; command and control facilities; surface-to-surface missile storage and assembly complexes; and other high value military assets. Concept screening and mission-level analysis conducted in 1997 produced a robust cross-section of alternative weapon concepts in three categories: direct attack munitions, cruise missiles, and ballistic missiles. In-depth analysis is under way to identify the best concepts from each category in terms of mission effectiveness and technical maturity. These assessments will then be used to cultivate and shape Service requirements and prepare emerging weapon systems for Milestone I acquisition decisions.

Key program accomplishments in 1997 included assessment of weapon systems concepts, reorganization of the IPT structure to facilitate performance of the Analysis of Alternatives, assembly of a representative target list, establishment of metrics to evaluate mission effectiveness,

completion of concept screening, and preparatory steps for a weapon concept acquisition Milestone I decision by the Defense Acquisition Board. Efforts are under way to explore the possibility of conducting weapon concept target defeat demonstrations as part of the CP2 ACTD. This program is supported by Air Force and Navy program elements and DSWA's Hard Target Defeat Program described below. Additional details are provided in Table 5.6 and in Appendix C (Tables C.4 and C.5).

DSWA Hard Target Defeat Program. DSWA's Hard Target Defeat Program evaluates the hard target problem end-to-end, from detection through counterforce to BDA, and develops improved technologies and tactics to defeat hard targets, particularly tunnel facilities. As a focal point for these technologies, DSWA and DIA have teamed to initiate the Tunnel Defeat Demonstration Program. Operational CINC customers are expected to participate in the target characterization, target planning, attack, and BDA elements of the demonstration. DSWA's Hard Target Defeat Program also supports the HDBTDC IPT with weapon target interaction analysis and is working with OSD and the Air Force (as lead service) to ensure that the best target defeat technologies are being used to support critical acquisition decisions. Additional details are provided in Table 5.6 and in Appendix C (Table C.8).

DSWA Weapons Systems Lethality Program. This program focuses on the development and validation of methodologies and research tools for applied analysis performed under the Counterproliferation Support Program as well as the Force Protection Initiative and other emerging counterterrorism programs (see Section 8.3). It supplies the CINCs with targeting tools for NBC/M and conventional targets and tools for collateral effects and hazard prediction through the USEUCOM-sponsored Counterproliferation ACTDs. Targeting tools are available to other users through the Joint Technical Coordinating Group for Munitions Effectiveness. The program conducts precision and sub-scale testing and advanced numerical calculations to develop and validate methodologies associated with weapon-target interactions and the transport and dispersal of hazardous NBC materials, including NBC collateral effects releases. Key accomplishments include developing/validating models for combined weapons effects in the CP1 ACTD and providing hazard assessment support to contingency operations. Additional project details are provided in Table 5.6 and in Appendix C (Table C.8).

Navy Hard Target Munitions Program. Under this program, a cooperative Army/Navy effort established the design for the missile interface, reentry body, and missile modifications necessary for an earth penetrating variant of the Army's Tactical Missile System (TACMS) deliverable by the existing Army M270 tactical missile launcher and eventually by Navy surface ships and submarines. This variant, proposed by the Army TACMS program manager in conjunction with Navy Strategic Systems Programs, makes use of the demonstrated capabilities of the Army TACMS and the reentry and penetrator components developed by the Navy to hold the full spectrum of NBC/M-related targets at risk. This project leverages developments in strategic reentry systems technology (including aeroshells, attitude control systems, and guidance systems), advanced penetrator technology, and the HTSF under development by DSWA and the Air Force. In addition, this program supports the Navy's contribution to the HDBTDC program for development of advanced conventional earth penetrating munitions. Additional details are provided in Table 5.6 and in Appendix C (Table C.4).

Air Force Agent Defeat Weapon Program. This program was initiated in response to a Combat Air Force Mission Need Statement and a Milestone 0 Acquisition Decision Memorandum. The objective of the current Concept Exploration and Definition acquisition activity is to develop a means to defeat or neutralize CW/BW agents and immobilize or deny access or freedom of use of their associated delivery systems. All agent defeat weapon concepts will minimize collateral damage and effects and be deliverable by current Air Force platforms. The effort is managed by an IPT, and the Air Force Nuclear Weapons and Counterproliferation Agency is leading the technical effort. A study team is currently evaluating the feasibility of alternative concepts. Key program accomplishments in 1997 included the construction and preliminary validation of agent release and dispersion models to assess collateral effects release and neutralization phenomenology, completion of an empirical lethality model for determining the effectiveness of agent defeat mechanisms, assessment of all current inventory munitions for neutralization effectiveness and collateral effects release potential, and preliminary effectiveness analysis of proposed concepts submitted by industry and U.S. government laboratories in response to a Request for Information. Activity in 1998 will focus on completing the review of proposed concepts, establishing a comprehensive test program to downselect the most suitable concepts, and further defining the cost and scope of the anticipated Agent Defeat Weapon acquisition program. Additional information is provided in Table 5.6 and in Appendix C (Table C.5).

DARPA Surveillance Sensor and Exploitation Systems Program. This RDT&E program is designed to improve capabilities to detect, identify, and track high value, time critical, fixed and mobile targets, including mobile NBC-armed missile launchers and NBC/M facilities and infrastructure elements, by developing sensors to defeat camouflage, concealment, and deception practices and providing near real-time exploitation of wide area imagery. Key accomplishments include: i) development of a foliage penetration (FOPEN) radar concept and verification of systems requirements for a FOPEN Airborne Demonstration Radar; ii) completion of a critical technology demonstration of an ultra-wide-band synthetic aperture radar antenna design and automatic target detection/cueing technologies; iii) transitioning target recognition algorithms into DARPA's Semi-Automated Imagery Processing (SAIP) ACTD currently under way and demonstrating the use of U-2 aircraft imagery on the enhanced tactical radar correlator; and iv) initial development of the next generation of model-based automatic target recognition (ATR) systems addressing target articulation and obscuration. Additional project details are provided in Table 5.6 and in Appendix C (Table C.7).

DARPA Information Integration Systems Program. This program supports efforts to enhance real-time situation assessments by developing an integrated, all-source, geographically referenced battlefield knowledge base and information distribution system. It supports improved capabilities to detect, identify, and track high value, time critical fixed and mobile targets, including NBC-armed missile launchers and NBC/M support facilities. Key accomplishments include: i) completed integration of a single intelligence source correlator; ii) demonstration of the functionality of a global broadcast service and information servers for rapid dissemination of imagery products; iii) demonstration of the operational utility of disseminating intelligence products (imagery and UAV video) and one-way video teleconferencing of commanders' intent; and iv) completion of nine independent correlation systems using open systems architectures. Additional project details are provided in Table 5.6 and in Appendix C (Table C.7).

Table 5.6: Key DoD Counterproliferation Activities and Programs in NBC/M Counterforce

Program/Project Title	Project Description	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
CP Support Program		(See Section 5.4)			
• Battlefield Surveillance Projects	• See Section 5.4				
• Advanced Weapons Systems (AUP, HTSF, and ITAG) and CP2 ACTD standoff weapon enhancements	• Development of an enhanced penetrating munition for hard and underground target defeat offering expanded compatibility with delivery platforms and an all-weather capability • Weapon systems procurement	2, 3	DSWA Air Force DOE Navy	18.779 16.833	603160BR Procurement
• Collateral Effects Phenomenology Assessment	• Source term characterization and transport prediction, phenomenology experiments, and assessment tool development	2, 3, 11	DSWA	8.100	603160BR
• NBC/M Target Planning and Response/Vulnerability Assessment	• Experimental and analytical analyses of NBC/M target response/vulnerability and automated target planning for NBC/M facilities	11, 2, 3, 5	DSWA	5.500	603160BR
• Counterproliferation ACTDs (CP1 and CP2)	• Integrated operational testing to support early deployment of new counterforce capabilities against NBC/M and underground targets	2, 3, 11, 8	DSWA EUCOM	6.719	603160BR
Strongly Related CP Programs					
• Hard and Deeply Buried Target Defeat Capability	• Joint Service evaluation and development of hard and deeply buried target defeat capabilities	3, 2, 5, 8,11	Services DSWA OSD DIA	9.803	604327F
• DSWA Hard Target Defeat Program	• End-to-end evaluation and development of improved tactics and technologies for hard target characterization and defeat	3, 2, 11	DSWA	10.780	602715BR
• DSWA Weapons Systems Lethality Program	• Evaluation of conventional weapon lethality and effects and collateral effects assessment; maintain core competency in nuclear weapons effects	11, 2, 3, 5	DSWA	48.940	602715BR
• Navy Hard Target Munitions Program	• Cooperative Navy/Army development of a conventional earth penetrating variant of the Army's Tactical Missile System • Supports HDBTDC program	3, 2, 5, 8, 11	Navy Army	9.827	604327N
• Air Force Agent Defeat Weapon Program	• Develop capabilities and munitions to defeat or neutralize BW/CW agents and their delivery systems with little or no collateral damage	2, 4, 12, 11	Air Force DOE	0.298	604222F
• DARPA Surveillance Sensor and Exploitation Systems Program	• Develop sensors to defeat camouflage, concealment, and deception practices and provide near real-time semi-automated exploitation of wide area imagery to track critical mobile targets	12, 8, 11, 2, 3	DARPA	47.400	603762E
• DARPA Information Integration Systems Program	• Integrated, all-source, geographically referenced battlefield knowledge base and information distribution system development for enhanced real-time situation assessment and intelligence dissemination	12, 8, 11	DARPA	77.900	603760E

5.5.4 Near-, Mid-, and Long-Term Milestones for DoD NBC/M Counterforce Programs. Figure 5.3 summarizes the time-phased milestones of those NBC/M counterforce programs discussed above and having clearly identifiable acquisition milestones. With the completion of the Counterforce CP2 ACTD in FY 2003, considerable capability enhancements will be in place for defeating hard, underground, and NBC/M targets. Furthermore, early in the

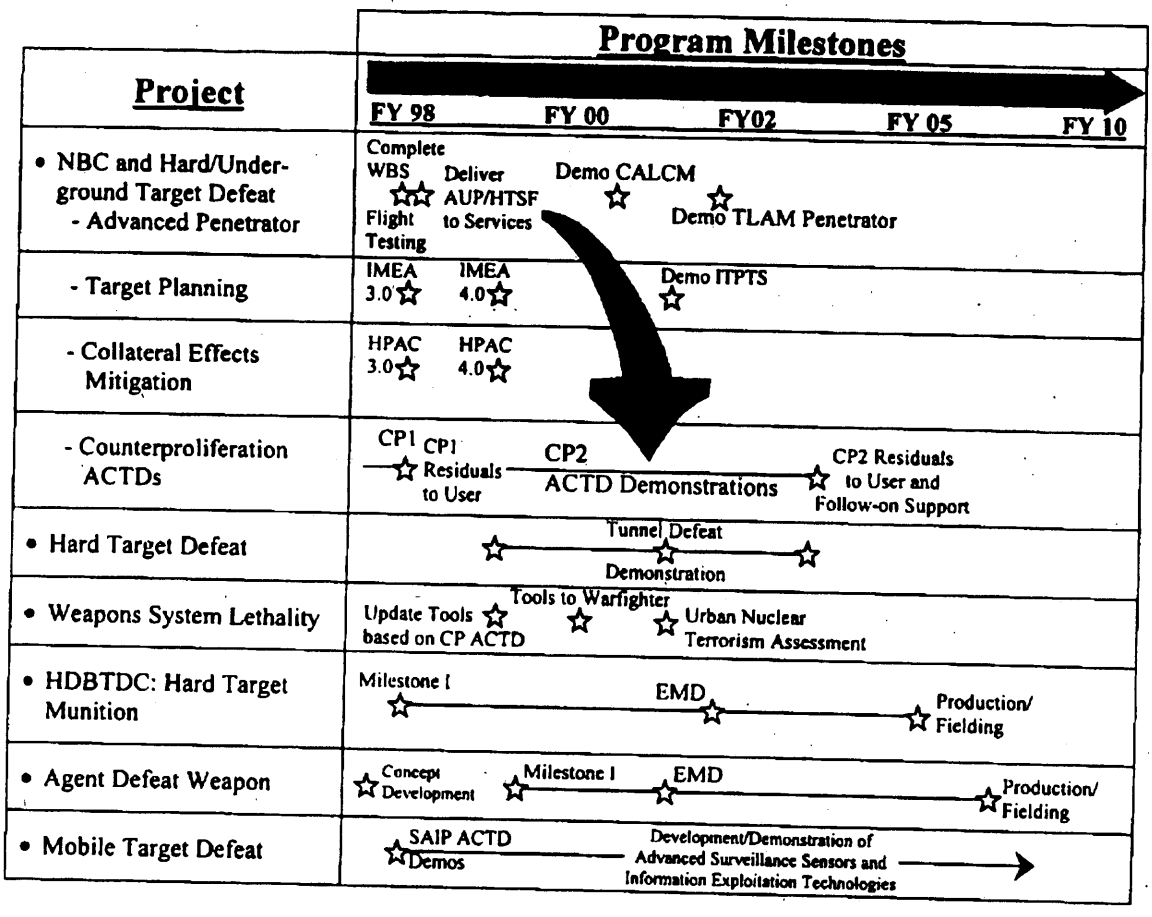

Figure 5.3 Time-Phased Milestones of NBC/M Counterforce Programs

next century a whole new generation of mobile target defeat technologies are expected to be ready for deployment.

5.6 Status and Accomplishments of DoD Active Defense Activities and Programs

5.6.1 Relevant Counterproliferation ACEs and DoD Policy Perspectives. Active defense is an integral element of counterproliferation because it protects U.S., allied and coalition forces, and noncombatants from NBC weapons by intercepting and destroying ballistic missiles, cruise missiles, and aircraft armed with NBC weapons in flight and before they can reach friends and allies. Such a capability serves to reduce the benefit an adversary would expect to gain by the use of NBC weapons. Both theater and national ballistic missile defense (DoD ACE priority 4) and cruise missile defense (DoD ACE priority 7) continue to be top DoD counterproliferation priorities.

DoD's theater missile defense approach is to build on present air and missile defense systems to provide first a near-term defense, and then develop capabilities to intercept enemy air

and missile systems at higher altitudes and longer ranges to keep NBC weapons even farther away from U.S. and allied forces. Since threat missile systems differ in their characteristics and capabilities, no single defensive system can counter them with sufficient effectiveness or with the high confidence necessary for an effective defense against NBC weapons. This is why DoD is developing an integrated "family of systems." The Ballistic Missile Defense Organization (BMDO) and the Joint Theater Air and Missile Defense Organization (JTAMDO), in cooperation with the Services, are focused on a core set of systems that will facilitate this integration process. The first of these is the Army's PATRIOT system, which has undergone several system upgrades since the Gulf War. By 1999, near-term upgrades for PATRIOT will leverage recent technological advances to increase theater ballistic missile defense (TBMD) lethality and effectiveness. BMDO and the Navy are leveraging the technologies of the AEGIS and Standard Missile (SM) air defense systems to give them endoatmospheric missile intercept capabilities by FY 2001 and exoatmospheric capabilities shortly thereafter. BMDO and the Army are also developing an exo-/endoatmospheric interceptor vehicle. Joining these core programs is the Air Force's Airborne Laser (ABL) system which will intercept theater ballistic missiles in their boost phase. Effective boost phase defense, where intercept occurs early in flight over the launching country, serves as a key deterrent against the use of NBC/M because of the potential for NBC contaminant debris to fall back on the aggressor's own territory.

Underlying all of these efforts are programs to develop the corresponding battle management/command, control, communications, computers, and intelligence (BMC4I) capabilities necessary to achieve an effective defense with Joint Service interoperability. BMDO also participates in several international programs to help allies develop theater missile defense capabilities and to learn from what they accomplish, with the aim that these systems, when fielded, will be interoperable with U.S. systems. BMDO programs are continuing to develop advanced technologies to enhance future active defense systems. BMDO also manages the NMD program for U.S. homeland defense.

5.6.2 New DoD Initiatives in Active Defense. As various elements of the active defense family of systems have matured and with an infusion of additional congressional funding, DoD has undertaken organizational and programmatic changes to accelerate the pace of active defense programs and manage them more effectively. For instance, DoD has restructured some of the core programs to increase funding for to more extensive testing of selected components to reduce technical risk. During the year, an NMD Joint Program Office was established to manage the multi-Service components of the NMD system and to oversee their integration into an effective architecture. Also, the Navy Theater-Wide (NTW) TBMD and the Medium Extended Air Defense System (MEADS) programs were elevated to Major Defense Acquisition Programs, putting them on the same acquisition level as all the other core systems. The Navy Area TBMD program, which entered the Engineering and Manufacturing Development (EMD) phase of the acquisition cycle in early 1997, let a contract to build 45 of the SM-2 (Block IVA) missiles. Additionally, the procurement funding lines for the PATRIOT Advanced Capability (PAC-3) and Navy Area TBMD programs, which in FY 1998 were managed by the Services, have returned to BMDO oversight and now appear in BMDO's portion of the President's Budget submission for FY 1999. A new Army/DARPA initiative, the Counter Chemical Multiple-Launch Rocket Study, will evaluate active defense counters to short-range rockets including those armed with CW/BW. "Leap-ahead" technology risk mitigation will continue through FY 1999 culminating in a

technology demonstration by FY 2001 that addresses the chemical rocket threat to U.S. Forces in South Korea.

5.6.3 Counterproliferation Support Program Projects in Active Defense. The Counterproliferation Support Program currently has no projects in the area of active defense.

5.6.4 Active Defense Programs Strongly Related to Counterproliferation. BMDO and Service programs are addressing counterproliferation ACEs in active defense. These programs are described below.

BMDO Programs. BMDO is currently managing several programs for both theater and national missile defense, including: i) continuing the development of upgrades to the Army's PATRIOT PAC-3 system and the Navy's Area TBMD system; ii) developing and testing the Army's Theater High Altitude Area Defense (THAAD) system; iii) developing the Navy Theater Wide TBMD system; iv) cooperating with other countries in several international programs including MEADS; v) developing an investment strategy for attack operations; and vi) managing the NMD program.

The first of BMDO's core programs for near-term deployment is the *Army PAC-3 system* which is being developed in several configurations. The first two configurations featured the Guidance Enhanced Missile (GEM), and units employing this configuration have already been fielded. The third configuration of PAC-3 will use a more capable hit-to-kill missile and a substantially upgraded radar. The Army conducted two successful tests of the PAC-3 missile in 1997, focusing on testing the flight environment, launch and flight functions, and the interface with the rest of the PATRIOT system. The PAC-3 missile will begin low-rate initial production (LRIP) in FY 1998 and will be fielded in late FY 1999. The second of the lower-tier systems is the *Navy Area TBMD* system. This program builds on the national investment in AEGIS ships and weapon systems and the Navy SM-2 Block IV missiles now being used for air defense. With software upgrades to the AEGIS SPY-1 radar, coupled with improved kinematics and fuzing for the SM-2 missile and a blast-fragmentation warhead, this system will be capable of ballistic missile intercepts within the atmosphere. With this system, the Navy can bring a missile defense capability into a theater without the need for host nation support. It will be particularly useful in providing NBC/M protection to ports, coastal airfields, amphibious objective areas, allied forces ashore, and other high value sites. The Navy plans to field a User Operational Evaluation System (UOES) in FY 1999 with first unit equipped (FUE) in 2001.

The higher altitude or upper-tier portion of the family of systems for active defense features Army and Navy programs that are still in the Program Development and Risk Reduction (PDRR) phase of the acquisition cycle and are not due for deployment until after the year 2000. The Army's *Theater High Altitude Area Defense* system will provide an exo-/endoatmospheric intercept capability that will make it possible to protect broad areas, dispersed assets, and population centers against theater ballistic missiles. An important advantage of the THAAD system, from an NBC/M perspective, is that its longer range and higher intercept altitude allows its X-band radar and hit-to-kill warhead to engage incoming threats multiple times, thereby increasing the probability of intercept. Seven THAAD flight tests have been conducted since 1995. Four of the seven were intercept attempts and were unsuccessful. However, a technical review of the

program in 1997 showed that the design of the THAAD system is sound and that testing should continue. The QDR restructured the program to put more emphasis on risk mitigation. The current plan calls for making the THAAD UOES prototype available in FY 2000 for limited use as a contingency capability during a national emergency. FUE (i.e., one battery with an upload of missiles) is planned for FY 2006.

The *Navy Theater Wide TBMD* system is an upper-tier exoatmospheric active defense system that leverages the Navy Area TBMD program, the AEGIS Weapons System, SM, and Vertical Launch System. However, the capabilities of all these systems will be upgraded, especially the range and lethality of the SM, to achieve a depth of fire and defense that can span an entire theater-wide region without the need for land bases. It will be capable of intercepting threat missiles in their ascent phase, at apogee, or during descent. Coupled with the lower-tier systems, like PAC-3 and the Navy Area TBMD system, the upper-tier systems will make possible a layered defense, which will significantly improve capabilities to protect friendly forces and allied populations against NBC/M threats. The main objectives of the Navy Theater Wide TBMD evolutionary program is to give the SM more range and lethality with the Block I and II upgrades. The present SM-2 Block IVA missile will migrate into the SM-3 with the addition of a third stage, and the Lightweight Exoatmospheric Projectile (LEAP) will become the kill vehicle. The AEGIS LEAP Intercept program is scheduled to conduct its first intercept in the fourth quarter FY 1999. The program will transition into the EMD phase in FY 2003, and the FUE with Block I is expected to occur in FY 2006.

The U.S. government has entered into an international cooperative program with Germany and Italy to develop the MEADS. This system will fill a critical void in the current force structure by providing organic air defenses to land maneuver forces against very short and short range theater ballistic missiles, cruise missiles, air-to-surface missiles, UAVs, and fixed and rotary wing aircraft. Additionally, the MEADS netted distributed BMC4I system ensures interoperability in support of Joint and combined operations. While this program is funded through FY 1999, funding in the out-years is being reviewed because of budget constraints. BMDO is also cooperating with the Israeli government in the development of their *Arrow National Defense System*. Cooperative studies or experiments are also being conducted with the United Kingdom, Canada, Australia, France, Germany, and Norway.

All of the systems discussed above are designed to intercept NBC-armed air and missile systems after they have been launched, but it may be more effective and cheaper to conduct counterforce operations (also referred to as "attack operations" in a theater missile defense context) against enemy tactical systems supporting launch operations, including mobile launch systems, before the aircraft or missiles can be launched. In coordination with the Services, BMDO continues to monitor and sponsor studies and experiments that examine the effectiveness and cost trade-offs between active defense and counterforce operations against NBC weapon delivery systems. In one major study, BMDO identified the key technologies needed for effective counterforce operations and is developing an investment strategy for developing and acquiring them. BMDO also sponsored a countermobility experiment in the Roving Sands theater missile defense exercise that successfully explored techniques for predicting the location of enemy mobile missile launch sites.

DoD is concerned about defending the U.S. homeland from ballistic missiles carrying NBC warheads. At present, no Third World country has ballistic missiles with sufficient range to attack targets within the United States or to hold American cities and populations hostage to an attack. For some of our potential Third World adversaries, the incentives for acquiring such a capability, even one or a few missiles with NBC warheads, are high. The BMDO-managed NMD Joint Program Office (JPO) is developing defenses that, if deployed, could preclude the success of a limited Intercontinental Ballistic Missile (ICBM) attack on the U.S. homeland. The NMD program serves counterproliferation by calling into question the very efficacy of ICBMs – why should an adversary acquire them if they won't be effective? The NMD program has accordingly been upgraded from a technology development program to a Major Defense Acquisition Program, and its budget has been increased substantially. Over the next few years, components of an NMD system, which have been under development for some years, will be integrated and subjected to an intense testing and evaluation program including ground and flight tests and simulations. The program is designed to complete the integration and development of an NMD system within three years and bring the system to a point that it could, if necessary, be deployed within another three years. NMD system flight tests will be conducted at the national test range in the Pacific and will include the first intercept flight tests occurring with a partially integrated system in FY 1998. A fully integrated flight test will follow by late FY 1999 which will support an initial decision in mid-FY 2000 on whether or not to deploy the system.

Key BMDO accomplishments since last year's report include an additional three successful flight tests, including the first controlled test of the PAC-3 missile and two successful tests of a candidate NMD kill vehicle. Components of the THAAD system participated in the Roving Sands '97 exercise and successfully demonstrated passing track data between THAAD and PATRIOT units. On another occasion, the THAAD radar functioned successfully as the primary sensor in flight test number seven. Several of BMDO's acquisition programs met and passed key programmatic milestones, most notably the Navy Area TBMD program, which passed a Defense Acquisition Board Milestone II review, and the Navy Theater Wide defense program, which became a Major Defense Acquisition Program. The NMD program was reviewed by the Defense Acquisition Board, and a highly accelerated competition for an NMD Lead System Integrator to integrate, develop, and test the NMD system was completed. Additional project details are provided in Table 5.7 below and in Appendix C (Table C.6).

Joint Theater Air and Missile Defense Organization. JTAMDO was established in November 1996 by the Vice Chairman of the JCS and USD(A&T) to develop and coordinate joint theater air and missile defense requirements and efforts, including those for ballistic and cruise missile defenses. JTAMDO acts as the CINCs' and the Services' proponent for theater air and missile defense requirements. The coordination mechanism is the Joint Theater and Air Missile Defense Master Plan, which focuses development on extending surveillance, improving BMC4I, and development of a single integrated air picture. JTAMDO is the single organization within DoD responsible for joint integrated theater air and missile defense requirements, operational concepts, and architectures. BMDO serves as the lead R&D and acquisition agency and as the integration systems architect, with the responsibility of translating JTAMDO-developed requirements into systems architectures. Additional details are provided in Table 5.7 and in Appendix C (Table C.13).

Army PATRIOT PAC-3 RDT&E and Procurement. Except for purchase and installation of modification kits, BMDO has procurement responsibility for PATRIOT PAC-3 upgrades through FY 2003. The PAC-3 system will be introducing leap-ahead technology with the fielding of the hit-to-kill PAC-3 missile. The GEM, an upgraded version of the PATRIOT PAC-2 missile, provides improved intercept capabilities against ballistic and cruise missiles. In FY 1998, 52 PAC-3 missiles, 11 PAC-3 launch stations, and 6 radar station modification kits will be procured. In a recent flight test, a PAC-3 system with GEMs shot down a SCUD target missile. RDT&E activities are under way to support development of the Remote Launch Communications Enhancement System, threat simulations, and Pre-Planned Product Improvement (P3I) system testing. Additional project details are provided in Table 5.7 and in Appendix C (Table C.3).

Army Missile Defense Systems Integration and Theater Missile Defense BMC4I Procurement Programs. Funded through BMDO, this program encompasses systems analyses, studies, and experimentation designed to validate and integrate the four key functions of Army theater missile defense: active defense, passive defense, counterforce operations, and BMC4I. This Demonstration/Validation (Dem/Val) and systems integration program develops hardware and software components, doctrinal and procedural solutions, subsystem interface controls, and systems architectures. This program also supports the U.S. Army Space and Missile Defense Command's Missile Defense Battle Integration Center which is building a flexible linked architecture of pre-existing live, virtual, and constructive simulations in a distributed interactive simulation based architecture to support training, exercises, advanced concepts and requirements development, and military operations associated with theater and national missile defense and space operations. The Army is also providing critical BMC4I systems for theater missile defense, including Joint Tactical Information Distribution System (JTIDS) terminals to ensure multiple platform interoperability, and multifunctional information distribution system terminals. Additional project details are provided in Table 5.7 and in Appendix C (Table C.3).

Navy Active Defense Programs. Procurement responsibilities for Navy theater ballistic missile defense have been transferred back to BMDO. Initial Navy Area TBMD capability will be installed on two AEGIS cruisers later this year. The SM2-BlockIVA EMD contract was awarded in October 1997. Navy Area TBMD UOES was accelerated to late 1998 with first unit equipped in FY 2001. The Navy Theater Wide/AEGIS LEAP Intercept program is scheduled to be reviewed by the Defense Acquisition Board in April 1998 to assess program content and the planned acquisition strategy. Additional project details are provided in Table 5.7 and in Appendix C (Table C.4).

Marine Corps Theater Missile Defense Capability. The Marine Air Control Squadron AN/TPS-59 radar will undergo modifications that will significantly improve its air defense and theater missile defense capabilities. Improvements include increased range and altitude for both air breathing targets and theater ballistic missiles, a capability for tracking/cueing of multiple missiles, and a lowered minimum target radar cross section detection capability. Although the Marine Corps will divest itself of the HAWK air and missile defense system in FY 1999, the HAWK's low altitude surveillance continuous wave acquisition radar will be retained. This radar is a lightweight, highly mobile radar that will be employed for cruise missile defense and low level "gap filler" coverage, increasing early detection and warning in support of the AN/TPS-59 air defense role. Additional project details are provided in Table 5.7 and in Appendix C (Table C.4).

The Air Force Airborne Laser Program. The Air Force is developing an ABL weapon system for defense against theater ballistic missiles during the boost phase of missile flight. The ABL integrates demonstrated state-of-the-art laser, adaptive optics, beam control, fire control, and BMC4I technologies onto a commercial Boeing 747-400F aircraft. This revolutionary, speed-of-light, forward-deployed weapon system will be capable of autonomously detecting, acquiring, identifying, tracking, and destroying theater ballistic missiles in their boost phase. The system will provide precise cueing information to the rest of the theater missile defense architecture enabling terminal defense systems and attack operations assets to increase their engagement envelopes and improve their lethality. ABL is in the second year of a $1.3 billion PDRR program that will culminate with a lethal shoot-down of a boosting missile in FY 2002. In FY 1998, the program will order the 747-400F aircraft, continue demonstrating flight-weighted laser module performance, and conduct a Preliminary Design Review. The PDRR program is designed to provide the CINCs with a half-powered residual operational capability in FY 2003. The goal is to begin fielding the first of seven production systems in FY 2006 with full operational capability achieved in FY 2008. The Air Force is also evaluating ABL's effectiveness in other mission areas including cruise missile defense, self-protection, suppression of enemy air defenses, and as a surveillance platform. Key program accomplishments during 1997 include: i) completion of the PDRR Program Requirements Review; ii) successful demonstration during Roving Sands '97 (through simulation) of ABL's effectiveness as a theater missile defense cueing source by providing accurate missile launch points, impact points, and missile booster burnout position and velocity information to terminal defense and attack operations assets; iii) successful demonstration of ABL-specified laser energy using flight-weighted laser module components which validated flight-weighted laser nozzle design; iv) successful completion of three seasonal atmospheric turbulence data collection campaigns, which provided further validation of the ABL design specification for turbulence; and v) initial fabrication of the first of six PDRR laser modules. Additional project details are provided in Table 5.7 and in Appendix C (Table C.5).

Air Force Theater Missile Defense R&D Program. This program is working to improve the ability to detect, locate, identify, and destroy (or otherwise neutralize) an enemy's theater missile capability and its supporting infrastructure elements in all phases of theater conflict. It defines improvements to existing BMC4I and attack operations capabilities, develops and evaluates prototype systems, demonstrates modifications during operational concept demonstrations, and coordinates transfer of improvements to operational systems. Key accomplishments include: i) demonstration of Link-16 datalink range extension and integration of the theater missile defense message sent to the Airborne Warning and Control System (AWACS) aircraft; ii) development of automated applications for conducting Intelligence Preparation of the Battlespace (IPB); iii) completion of country studies as part of the IPB process; iv) development of planning tools and a targeting decision aid for time-critical targets to assist in deployment of air and missile defense systems; v) completion of an expert missile tracker prototype; and vi) development and demonstration of automated target recognition (ATR)/automated target cueing (ATC) capabilities for the F-15E "TESSA" (Theater missile defense Eagle Smart Sensor with ATR) and Joint Surveillance Target Attack Radar System (JSTARS) aircraft. Additional project details are provided in Table 5.7 and in Appendix C (Table C.5).

Air Force Space Based Infrared System. SBIRS is a replacement for the Defense Support Program space based early warning system and consists of a space segment of geosynchronous,

Table 5.7: Key DoD Counterproliferation Activities and Programs in Active Defense

Program/Project Title	Project Description	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
Strongly Related CP Programs					
• JTAMDO Support	• Planning, coordination, and oversight of Joint integrated theater air and missile defense requirements, operational concepts, and architecture development	4, 7	Joint Staff	17.423	605126J
• BMDO Programs*	• PATRIOT PAC-3 EMD • PATRIOT PAC-3 Procurement • Navy Area TBMD EMD • Navy Area TBMD Procurement • THAAD PDRR • THAAD EMD • Navy Theater Wide PDRR • MEADS • National Missile Defense • National Missile Defense MILCON • International Cooperative Programs	4, 7	BMDO	137.265 343.235 245.796 43.318 497.752 323.942 190.446 43.027 950.473 12.230 50.676	604865C 208865C 604867C 208867C 603861C 604861C 603868C 603869C 603871C MILCON 603875C
• PATRIOT PAC-3 Procurement	• Procurement of missiles, launch stations, radar station modification kits, and communications upgrade kits	4, 7	Army	15.300	C50700
• Army PATRIOT PAC-3 RDT&E	• Development of the Remote Launch Communications Enhancement Unit, threat simulations, and P3I testing	4, 7	Army	9.285	203801A
• Army theater missile defense BMC4I Procurement	• Provide JTIDS terminals for platform interoperability in support of theater missile defense	4, 7	Army, BMDO	6.300	208864C
• Navy Area TBMD System	• Procurement of Cooperative Engagement System • Procurement of SM-2 Block IVA missiles	4, 7	Navy	47.300 **	204221N 204228N
• Marine Corps AN/TPS-59 modification	• Radar upgrades for low radar cross section target detection and transition of the HAWK low altitude surveillance radar	4, 7	USMC	8.354	Modification
• Air Force Airborne Laser Program	• Integration of high energy chemical laser, optical beam and fire control system, and related BMC4I systems onto 747-400F aircraft for demonstration of theater ballistic missile boost phase intercept system	4, 7	Air Force	292.219	603319F
• Space Based Infrared System	• Space based sensors supporting ballistic missile launch warning, technical intelligence collection, and battlespace characterization	4, 8	Air Force	732.000	603441F 604441F 604442F
• Air Force Theater Missile Defense R&D Program	• R&D integration to improve BMC4I and attack operations capabilities and their supporting elements	4, 7, 12	Air Force	31.057	208060F

* See Appendix C, Table C.6, for additional details. **Allocation of funding between SM-2 Block IV and IVA missiles has yet to be determined.

highly elliptical, and low earth orbit spacecraft and an associated ground segment. The SBIRS ground segment consists of a consolidated ground station, overseas relay ground stations, and mobile multi-mission microprocessors. SBIRS addresses the mission areas of strategic and theater missile warning, national and theater missile defense, technical intelligence collection, and battlespace characterization. SBIRS provides greater sensor sensitivity and faster sensor revisit rates than the current Defense Support Program system. The SBIRS High Component consisting of geosynchronous and highly elliptical orbiting spacecraft (and its associated ground segment) is in the EMD phase of acquisition, with the initial operating capability for the consolidated ground

station scheduled for FY 1999, and the first launch of geosynchronous spacecraft scheduled for FY 2002. The SBIRS Low Component of low-earth orbit satellites is in the PDRR phase of acquisition, and launch of the first operational satellite is scheduled for FY 2004.

5.6.5 Near-, Mid-, and Long-Term Milestones for DoD Active Defense Programs. Figure 5.4 summarizes the time-phased milestones of those active defense programs discussed above and having clearly identifiable acquisition milestones. As born out in the figure, starting with PATRIOT PAC-3 FUE in 1999, significant upgrades in active defense capabilities will occur over the next five to seven years.

5.7 Status and Accomplishments of DoD Passive Defense Activities and Programs

5.7.1 Relevant Counterproliferation ACEs and DoD Policy Perspectives. DoD supports an extensive NBC passive defense infrastructure to enable U.S. military forces to survive, fight, and win in NBC-contaminated environments. An integrated, balanced program is essential to achieve this objective. The ATSD(NCB) provides oversight of the Chemical and Biological Defense (CBD) Program which coordinates all DoD R&D and acquisition efforts in passive defense. The CBD Program is fully integrated with and is based on validated Service requirements generated in response to defined threats. U.S. forces must have aggressive, realistic training and

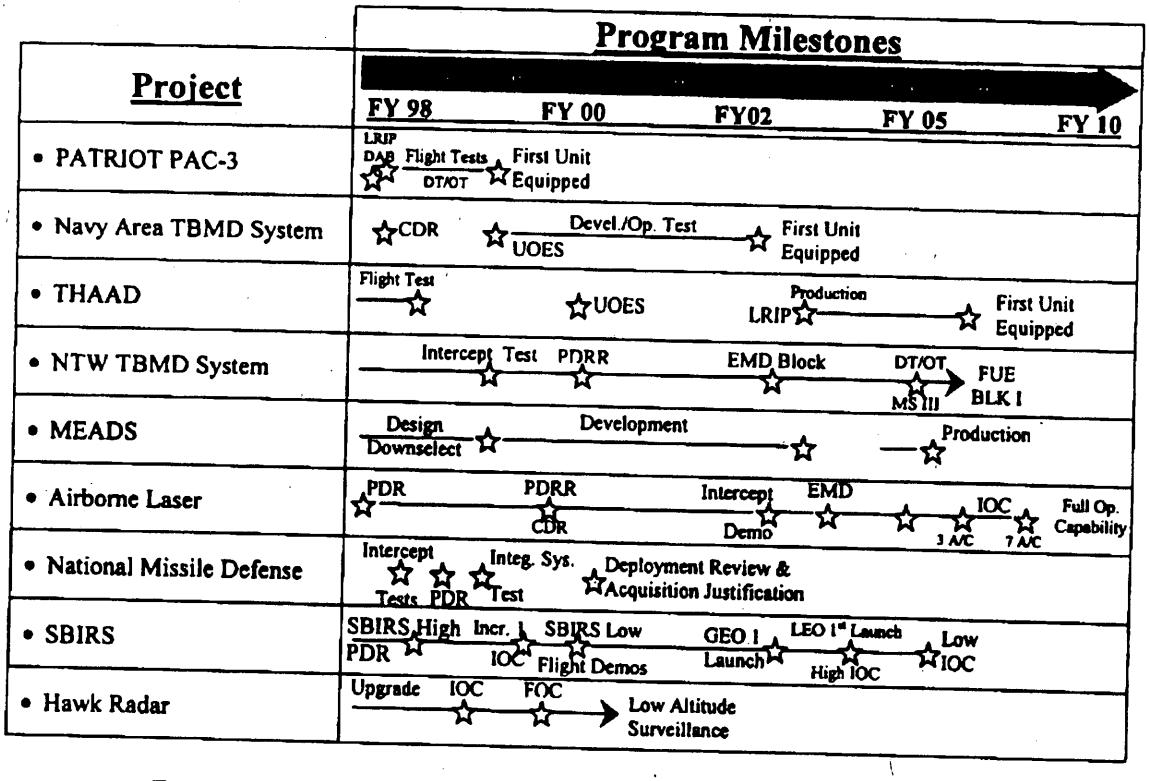

Figure 5.4 Time-Phased Milestones of Active Defense Programs

equipment that allows them to avoid contamination, and, where contamination cannot be avoided, they must protect themselves, decontaminate, and sustain operations throughout the battlespace environment. They must also have the capability to provide effective medical casualty treatment and management. To address these needs the CBD Program supports R&D and acquisition programs developing: i) systems to detect, identify, characterize, and provide warning of CW/BW agents (DoD ACE priorities 1 and 9); ii) individual and collective protection gear (DoD ACE priority 9); iii) methods to advance the speed and efficiency of defensive CW/BW agent decontamination (DoD ACE priority 9); iv) a broad array of CW/BW medical, casualty management and treatment activities (DoD ACE priority 9); and v) methods to increase BW vaccine production capacity, stockpile vaccine supplies, and develop a broader spectrum of new and improved BW vaccines and other medical countermeasures for CW/BW agents (DoD ACE priorities 10 and 9). In cooperation with the CBD Program, the Counterproliferation Support Program is continuing to leverage ongoing CBD programs to accelerate the fielding of critical systems and technologies in BW detection and early warning.

5.7.2 Counterproliferation Support Program Projects in Passive Defense. Counterproliferation Support Program projects in passive defense are funded through Chemical/Biological Defense accounts and are managed by the JPO-BD. The Counterproliferation Support Program is focusing its passive defense activities on accelerating and promoting the development of remote and standoff BW detection and early warning capabilities, including conducting the Joint Biological Remote Early Warning System (JBREWS) ACTD. The Counterproliferation Support Program is also supporting development and integration of advanced technologies in support of the prototype NBC Joint Warning and Reporting Network (JWARN). As a result of the Consequence Management 911-Bio ACTD, the "Chem War 2000" exercise, and a number of studies conducted by the Air Force and the Joint Staff, a "Restoration Operations" (RESTOPS) ACTD has been proposed to examine the doctrine, tactics, techniques, procedures, and equipment required to recover quickly from CW/BW attacks on ports, airfields, and other fixed sites. In addition to the above, Counterproliferation Support Program activities in passive defense continue to support the accelerated fielding of both an advanced eye safe infrared (IR) LIDAR system (i.e., an improved Long Range Biological Standoff Detection System, LR-BSDS) for long range battlefield detection of aerosol clouds indicative of BW use and an ultraviolet (UV) LIDAR system (i.e., the Short Range Biological Standoff Detection System, SR-BSDS) for standoff discrimination of BW (versus non-BW) agents. A prototype LR-BSDS unit will be delivered for testing by May 1998. The SR-BSDS transitioned to the JBREWS ACTD in FY 1998 and will be tested in joint field trials scheduled for FY 1998 and FY 1999. The Counterproliferation Support Program also supports DARPA development of technologies to support near-term fielding of advanced BW agent detection systems to include mass spectrometers, flow cytometers, and detectors employing multispectral UV fluorescence spectroscopy.

Key accomplishments since last year's report include: i) completion of the Consequence Management 911-Bio ACTD; ii) fabrication and demonstration of the LR-BSDS laser at full power and prototype preparation for follow-on testing; iii) testing of micro UV laser fluorescence biosensors at Joint Field Trials; and iv) conducting biological background aerosol sampling and analyses at several forward deployed troop sites to improve BW agent detection capabilities.

Additional details of the Counterproliferation Support Program passive defense projects are provided in Table 5.8 below and in Appendix C (Table C.1).

The Joint Biological Remote Early Warning System ACTD. The purpose of the JBREWS ACTD is to provide a framework for technology demonstrations, modeling, simulation and analytical efforts, culminating in an operational demonstration of a BW remote/early warning capability and the associated command and control connectivity required to provide automated warning and reporting. The objectives of this ACTD are: i) to evaluate the military utility of a BW early warning capability that allows an increased decision cycle to warn, report, and protect deployed forces; ii) develop operational procedures for BW attack warning and reporting; and iii) provide the sponsoring CINC with an interim capability, and support that capability for two years.

The JBREWS ACTD will provide the first Joint Service capability for BW remote/early warning across the battlespace. The ACTD is managed by the JPO-BD in conjunction with the Counterproliferation Support Program with oversight by the Chemical/Biological Defense Program and sponsored by USEUCOM. The following residuals or "leave behinds" are scheduled to be provided to the CINC: i) an automated BW sensor system network; ii) a validated Concept of Operations ensuring the operational effectiveness of the installed systems; iii) communications assets to provide C4I interoperability and connectivity for CW/BW threat reporting and dissemination; and iv) training packages verified and validated for use by operational forces (if required). The JBREWS ACTD started in FY 1998 and several demonstrations are scheduled during FY 1998, at Dugway Proving Ground, Utah, including a standoff detection demonstration and a network communications test. The final field trials will be held in FY 1999 to demonstrate a fully automated BW early warning system network.

5.7.3 DoD's Chemical and Biological Defense Program. All DoD chemical and biological defense programs are coordinated and integrated within a single office in OSD, in accordance with the requirements of 50 U.S. Code, Section 1522. ATSD(NCB) provides the overall guidance for planning, programming, budgeting, and executing the CBD Program. DATSD(NCB)(CP/CBD) is responsible for the every day coordination and integration of all chemical and biological defense R&D and acquisition efforts. Consolidating the oversight of the CBD Program into a single OSD office has been a critical tool for ensuring the elimination of redundant programs, ensuring coordination between the medical programs and the non-medical CW/BW defense efforts, focusing funds on program priorities, and enhancing readiness.

Funding for R&D and acquisition (including procurement) programs for CW/BW defense (along with some nuclear/radiological passive defense programs) has been consolidated, while O&M accounts remain with the Services. Significant progress has been made in the development of joint training, doctrine development, and requirements generation. Modernization and R&D/acquisition plans have been developed that show savings and true integration of efforts among the Services. For example, since 1995, 44 separate contamination avoidance developmental efforts have been consolidated into 9 fully coordinated joint projects. A congressional plus-up of $81 million for FY 1998 was appropriated to provide the needed research, training, and procurement of technology to equip U.S. forces with improved detection, protection, decontamination, and medical treatment capabilities. As part of the QDR $1 billion plus-up, an additional $732 million over the FYDP will also allow for the procurement of

additional quantities of passive defense equipment to enhance military readiness. Detailed descriptions of the management, plans, accomplishments, and systems that constitute the CBD Program can be found in its latest annual report to Congress entitled *Department of Defense Nuclear, Biological, and Chemical (NBC) Defense Annual Report to Congress*, published in February 1998.

All R&D and acquisition programs within the CBD Program are structured within six Program Elements (PE) corresponding to DoD R&D and acquisition roles: Basic Research, Applied Research, Advanced Technology Development, Dem/Val, EMD, and management support. Highlights of key programs strongly related to counterproliferation within each of these program elements are described below. Additional program details, including FY 1999 budget profiles, are provided in Table 5.8 and in Appendix C (Table C.2).

CW/BW defense is conducted within the framework of three principles: i) contamination avoidance, ii) protection, and iii) decontamination. These principles provide the basis for an integrated and balanced CW/BW defense program. Contamination avoidance is the highest priority area and consists of capabilities and procedures to: detect, identify, and warn forces of CW/BW threats; enable commanders to determine the appropriate protective posture to assume; and distribute the necessary information so that U.S. forces can avoid contamination. When contamination cannot be avoided, protection makes it possible to survive, fight, and win in a contaminated environment. Protection consists of three elements: individual protection, collective protection, and medical programs. Finally, decontamination provides critical capabilities to allow the sustainment of operations in a contaminated environment. This framework is detailed in Joint Publication 3-11, *Joint Doctrine for Nuclear, Biological, and Chemical (NBC) Defense*, which is currently undergoing a major revision. Key accomplishments in each commodity area are described in what follows.

Contamination Avoidance. Multiple systems are under development, in production, or have been fielded for early warning, point detection, and warning and reporting of CW/BW threats. Over the past year, there have been several accomplishments in contamination avoidance R&D and acquisition programs.

Science and Technology Base – Basic Research, Applied Research, and Advanced Technology Development. Basic Research efforts include coordination and consolidation of a mass spectrometric study of biological markers having potential utility in future BW detectors and investigation of techniques for generic detection of microbial toxins. *Applied Research* efforts include: i) evaluation of BW agent local detection technologies such as deoxyribonucleic acid (DNA) probes, electrospray mass spectrometry, planar wave guides, flow cytometry, and other advanced technologies to support detection and early warning of BW agents; and ii) continued development of technologies and compilation of databases for multispectral UV fluorescence detection and discrimination of BW agents in realistic battlespaces containing natural and man-made interferents. Key *Advanced Technology Development* projects include development and demonstration of remotely deployed integrated BW detection networks, lightweight stand-off chemical sensors, an automated BW detection network for high priority fixed sites (Portal Shield ACTD), and miniaturized mass spectrometers for CW/BW identification.

Demonstration/Validation. Key programs, managed by JPO-BD, include the Portal Shield ACTD which will provide a capability to detect, warn, de-warn, and presumptively identify against a BW attack at a CINC-designated air base or port facility. The design and analysis of bio suite components for the Joint Biological Point Detection System (JBPDS) will be accomplished during FY 1998.

Engineering and Manufacturing Development. There are several key programs in EMD that promise to offer greatly improved capabilities in the near term for contamination avoidance. Three programs successfully transitioned from the Dem/Val phase during FY 1997 and early FY 1998: i) the Lightweight Nuclear Biological Chemical Reconnaissance System (LNBCRS), which provides unit field commanders with real-time data that can be used to assess the battlefield for NBC hazards while on the move; ii) the Joint Chemical Agent Detector (JCAD), which is a combined portable CW monitor and small point CW detector for aircraft, shipboard, and individual soldier applications; and iii) the Joint Service Lightweight Standoff Chemical Agent Detector (JSLSCAD), which provides chemical agent detection and mapping for CW agent clouds and which was also integrated into the LNBCRS. Other ongoing EMD efforts include: i) JWARN, which automates NBC warning and reporting throughout the battlefield, and associated software to link the digital data into existing command, control, and communications systems; ii) the Chemical/Biological Mass Spectrometer (CBMS), which identifies collected CW/BW agents and is a component of the Biological Integrated Detection System (BIDS) Pre-Planned Product Improvement (P3I) system and the FOX NBC Reconnaissance System (NBCRS); and iii) the Shipboard Automated Liquid Agent Detector (SALAD) for CW detection. The critical design review and prototype development for the Joint Biological Point Detection System (JBPDS) will be accomplished during FY 1998.

Procurement. The NDI (Non-Developmental Item) BIDS was initially fielded in FY 1997 to the Army's 310th Chemical Company and its active component platoon, the 20th Chemical Detachment. Development of the BIDS P3I is on schedule. Procurement of long-lead items began in FY 1997 with fielding to the 7th Chemical Company scheduled for FY 1998 and FY1999. The BIDS P3I system will utilize developmental technologies, such as the CBMS, to detect eight BW agents, provide increased automation for detecting BW agents, and enable computerized integration of detector outputs. Procurement and fielding continued for the Automatic Chemical Agent Detector Alarm (ACADA), FOX NBCRS modifications, the AN/UDR 13 Pocket RADIAC (Radiation Detection, Indication, and Computation) nuclear radiation detector, and the Improved Point Detection System (IPDS) for shipboard use. Initial deployment for the Improved Chemical Agent Monitor (ICAM), an improved version of the already fielded Chemical Agent Monitor, and the FOX NBCRS is scheduled for FY 1999. Both systems are currently in production. Procurement of the JWARN digital hardware components and critical reagents for BW detector programs will be initiated in FY 1999.

Protection. Over the past year, there have been several accomplishments in all phases of R&D and acquisition for individual and collective protection, medical, and vaccine acquisition programs.

Science and Technology Base – Exploratory Development. Key technology base efforts to improve protection include: i) investigating enhanced protection technologies for masks; ii)

continued integration of advanced mask concepts into 21st century soldier systems; and iii) investigating technologies for a lightweight, extended wear, half-face mask for improved BW protection.

Demonstration/Validation. The key Dem/Val project for improving collective protection is the Advanced Integrated Collective Protective System (AICPS) which integrates new NBC filtration technologies with environmental controls and power generation components for tactical and combat systems. AICPS is designed to be integrated into multiple configurations to provide collective protection for a variety of tactical systems.

Engineering and Manufacturing Development. The Joint Service Lightweight Suit Technology (JSLIST) P3I program will develop improved chemical protective overgarments, duty uniforms, undergarments, gloves, and socks that will increase protection, reduce physiological burden, and increase durability beyond those items fielded under the initial JSLIST program. The JSLIST P3I is seeking new and advanced material candidates for its protective items to incorporate into the existing JSLIST design.

Procurement. The key protection procurement accomplishment was the fielding of the M40/M42 standard issue NBC protective mask. Initial production contracts were recently awarded for the M45 Aircrew Protective Mask (ACPM), which provides rotary wing air crews with a less burdensome respiratory protection system, and the Aircrew Eye/Respiratory Protection (AERP) mask, a second generation, CW/BW protective oxygen mask. Procurement activities continue for other protection programs including: i) the Chemical Biological Respiratory System (CBRS) for Navy rotary wing aircraft; ii) the M41 Protection Assessment Test System (PATS) to validate the fit of protective masks in the field; iii) the Chemical Biological Protective Shelter (CBPS) which provides a rapid set-up, contamination-free, environmentally controlled work area for Battalion Aid Stations; iv) the M40 P3I Mask; and v) the M20 P3I Collective Protection System. Procurement of the M28 Transportable Collective Protection Shelters (TCPS) for Air Force applications will be initiated later in FY 1998. The QDR $1 billion plus-up has helped satisfy part of the Air Force's transportable collective protection requirements. FY 1999 procurement funding will initiate the purchase of the AICPs. JSLIST, a Joint Service effort to field a common chemical protective ensemble (i.e., suit, boots, and gloves), is also being procured. The JSLIST provides chemical protection, reduced heat stress, full compatibility with all interfacing equipment, longer wear, launderability, a single technical data package and manual, a split issue feature to improve fit and reduce inventory, and flame retardantcy. JSLIST promotes commonality and standardization to maximize the effectiveness of resources and eliminate redundancy among the Services. Additional funding from Congressional and DoD budgetary plus-ups for FY 1998 and the out-years will provide for advanced technical development, procurement, and fielding of JSLIST by FY 1999.

Medical Programs. Over the past year, there have been several accomplishments in the development of medical countermeasures against nuclear and CW/BW agents. Medical countermeasures fall into three basic categories: prophylactic (preventative), therapeutic (post-exposure), and diagnostic. Key accomplishments in prophylactic countermeasures include: i) the continued development of advanced vaccines for anthrax, botulinum toxins, ricin toxin, Venezuelan equine encephalitis (VEE), and plague; ii) studies of biological scavengers for nerve

agents; iii) cyanide pretreatments; iv) continued development of a topical skin protectant effective against nerve and blister agents; and v) exploratory efforts to identify reactive topical skin protectants effective against CW agents. Key accomplishments in therapeutic countermeasures development include: i) development of a multichambered autoinjector (to replace the multiple injections currently required) which allows soldiers to more easily administer treatment after exposure; ii) successful Milestone 0 transition of an advanced anticonvulsant capable of improved central nervous system protection; iii) fielding of an improved, forward deployable diagnostic kit capable of detecting exposure to nerve agents; and iv) transitioning the radiation anti-emetic Kytril through Milestone III. Key accomplishments for diagnostic countermeasures include investigating potential treatments and diagnoses for low dose exposure to CW agents and the continued development of a forward deployable diagnostic kit that will allow immediate diagnosis of BW-related casualties in the field.

Technology base efforts for medical BW defense hold the promise of yielding important new products to protect U.S. forces from a wide range of BW agents. These efforts include the development of: i) multi-agent vaccines to reduce vaccine production costs and simplify immunization schedules; ii) bioengineered recombinant vaccines; iii) advanced pre-treatments based on biological scavengers (such as human enzyme butyrylcholinesterase); and iv) a common diagnostic kit using state-of-the-art technologies. The common diagnostic kit employs both antibody-based detection of BW agents in biological specimens and direct DNA detection of BW agents or natural infectious diseases using a hand-held polymerase chain reaction technique. The antibody-based and direct DNA detection approaches are scheduled to transition to advanced development in FY 1999 and FY 2002, respectively.

Procurement. Key collective protection programs in support of medical defense efforts include the CBPS, which is being procured between FY 1998 through 2003, and the M28 TCPS, scheduled for contract award later in FY 1998.

The Joint Vaccine Acquisition Program (JVAP). The JVAP was designed and developed to facilitate the acquisition of vaccines. As directed by the Deputy Secretary of Defense, the JVAP will use a prime systems contractor to manage and execute advanced vaccine development, FDA licensure, production, storage, and testing of 18 new BW vaccines that have been discovered through DoD-sponsored research. The prime systems contract was awarded in November 1997 and began with the development of three biological defense vaccine products: Q fever, Tularemia, and Vaccinia. The prime contractor also supports storage of the current contingent BW defense vaccine stockpile. There are options for the development and licensure of 15 other BW vaccines, with production options for all 18. The period of performance for this contract is 10 years. The development of vaccines under this program involves studies that demonstrate product safety and efficacy that are required for product licensure by the FDA. The JVAP is managed by the JPO-BD.

The Secretary of Defense announced in December 1997 DoD's plan to begin vaccinating Service personnel deployed to high-risk areas (or scheduled to deploy to these areas) against the BW agent anthrax. Eventually, all active duty and reserve forces are scheduled to be vaccinated. Detailed implementation plans for the vaccinations are currently being developed by the Services. Additional efforts are being sponsored by the DoD to obtain the requisite scientific data to support

a license amendment request to the FDA for a reduced immunization schedule below the six shots now required. The FDA-licensed anthrax vaccine is available commercially from the Michigan Biologic Products Institute. Animal studies indicate that it confers excellent protective immunity against aerosolized anthrax spores. Production of this vaccine has been ongoing since Operation Desert Shield/Desert Storm, and the DoD-prescribed stockpile level was completed in FY 1997. Another BW vaccine administered to a small percentage of U.S. forces during Operation Desert Shield/Desert Storm was for botulinum toxin (pentavalent). This vaccine is not FDA licensed, although it has been used for several decades to protect laboratory workers and has an excellent safety record. Efforts are ongoing to collect data on this vaccine and develop a package demonstrating product safety and efficacy for FDA licensure. After reviewing initial data, an FDA advisory council issued recommendations providing clear direction to DoD and the manufacturer for licensing this vaccine.

Decontamination. Over the past year, there have been several accomplishments in decontamination technology development programs. In addition, the CBD Program supported a JCS and Service effort known as Chem War 2000 to identify decontamination issues relative to power projection into asymmetric threat environments. The Chem War 2000 results are expected to lead to a roadmap and master strategy for tackling many operational decontamination and restoration problems.

Science and Technology Base – Exploratory Development and Advanced Technology Development. Research continues in using enzymatic technology to accomplish CW decontamination. Efforts also focus on developing decontamination approaches for sensitive (e.g., electronic) equipment.

Engineering and Manufacturing Development. The key EMD projects are the Modular Decontamination Systems (MDS) and development of a sorbent decontaminant, which may provide a non-aqueous replacement to the current decontaminant (denoted as DS2) and, by reducing the need for water, considerably reduce the logistics burden associated with current decontamination methods.

Procurement. Within the decontamination area, FY 1999 funding supports initial procurement of the MDS and continued procurement of the M17 Lightweight Decontamination System (LDS).

Chemical and Biological Defense – Management and Support. The primary program supported within this element is the Joint Chemical/Biological Contact Point and Test Program located at Dugway Proving Ground, Utah. This program provides assessments, laboratory analyses, and field tests on a wide variety of equipment that has been fielded or is in production. These activities respond to requests by the Services and CINCs for testing fielded capabilities. Accomplishments include six assessments, three field trials, and two laboratory tests evaluating systems performance in a CW environment. Funding is also provided under this program for management support for the overall integration and coordination of the CBD Program. Activities include: Joint Service requirements, training, and doctrine development by the Joint Service Integration Group; Joint Service modernization planning; development of a Joint POM and associated budget; and Joint R&D and acquisition planning by the Joint Service Materiel Group.

Additional funding is programmed for CW/BW defense joint doctrine, training, and NBC upgrades to war games as part of the Secretary of Defense's enhancements to counterproliferation-related programs.

The Joint Program Office for Biological Defense. Within the CBD Program, JPO-BD provides centralized management of DoD's battlefield BW defense acquisition programs, from PDRR through production. JPO-BD managed projects include: i) the BIDS P3I and the LR-BSDS systems; ii) the JBPDS; iii) the Portal Shield and JBREWS ACTDs; iv) the Critical Reagents Program (CRP); v) oversight of the JVAP; and vi) production and maintenance of the anthrax vaccine stockpile. The JPO-BD is developing improved capabilities for early warning of BW attack, including development of the eye safe LR-BSDS upgrade, adapting and developing point BW agent detectors for remote/early warning detection applications, and using the JBREWS ACTD to expedite the fielding of these systems. Key ACTDs within the biological contamination avoidance area include the Portal Shield and JBREWS ACTDs. The JBREWS ACTD will provide the first Joint Service capability for biological remote early warning across the battlespace. The Portal Shield ACTD will provide a networked point capability to detect, warn, dewarn, and presumptively identify against a BW attack at a CINC designated air base or port facility.

The Portal Shield ACTD. The purpose of this ACTD is to evaluate the military utility of an automated BW detection network and develop associated operational procedures. An additional objective is to provide a residual capability to detect, warn, de-warn, and presumptively identify a BW attack on an air base or port facility. The ACTD is managed by the JPO-BD, in conjunction with the Counterproliferation Support Program, with oversight by the CBD Program, and sponsored by U.S. Central Command (CENTCOM) and U.S. Pacific Command (USPACOM). The Portal Shield automated detection network will be capable of rapidly detecting and identifying BW agents, providing location reporting, and measuring meteorological conditions. The following residuals or "leave behinds" that will be provided to the CINCs are: i) an automated BW detection network; ii) an integrated command and control system to assist base personnel in the rapid assessment, warning, and dissemination of BW attack data; iii) oral-nasal half masks providing protection from re-aerosolized BW agents without the stresses associated with full face protective masks; iv) decontamination equipment for contaminated sensors; v) unmasking and de-warning procedures; and vi) biological sampling kits. With this system, warning of a possible BW attack can be transmitted to a central command post about 10-15 minutes after the initial detection. Testing of a redesigned and repackaged BW detector is under way, and full scale testing of a complete sensor network along with other residual equipment will be completed in the Summer of 1998. Deployment of ACTD products to CENTCOM and USPACOM are scheduled to begin in the fourth quarter of FY 1998.

The Joint Biological Point Detection System. The JBPDS is a developmental system that will replace existing and deployed BW detection systems such as BIDS, IBAD, and the Portal Shield ACTD interim detector systems. Its mission is to provide a common, integrated, and fully automated BW agent point detection capability. The JBPDS provides rapid detection of point and long line sources together with local and remote warning capabilities. JBPDS will develop a basic unit, a man-portable unit, and tailored interface kits for Service platforms (vehicle, ship, and fixed site). System production is scheduled to start in FY 2000 with FUE scheduled for FY 2001.

The Critical Reagents Program. This program was initiated in FY 1997 to provide BW detection systems with antibody and genetic detection materials to meet BW detection requirements. Its purpose is to ensure availability of quality reagents that are critical to the successful development, test and operation of BW detection systems and medical diagnostics. The program will ensure the availability of high quality reagents (antibodies and DNA probes/primers) throughout the life cycle of all systems managed by JPO-BD to include BIDS, IBADS, JBPDS, Portal Shield and JBREWS ACTDs, and medical diagnostic kits. These reagents will also be supplied to the Navy Forward Deployed Lab, the Army Theater Medical Lab, the Marine Corps Chemical/Biological Incident Response Force (CBIRF), and NATO to support counterterrorism, reconnaissance and surveillance teams, and background characterization applications.

NBC Weapon Effects Hazard Prediction. A number of important areas for improving NBC dispersion and hazard prediction modeling have been identified. These included the need for accurate coupling between hazard source data and predictions relating to high resolution weather effects, atmospheric/water transport, and physiological impacts. The DATSD(NCB)(CP/CBD) has taken the lead on NBC dispersion and hazard prediction modeling and has initiated a working group for accomplishing the modeling and simulation validation mission. Members of the working group include representatives from the Services, Joint Staff, DOE, U.S. Intelligence, as well as emergency response and weather monitoring organizations such as FEMA, the National Oceanographic and Atmospheric Administration, the Centers for Disease Control, and the National Weather Service. The community's primary requirement is to accurately model all disciplines associated with NBC plume sources, weather effects, NBC particle transport, and dosage impacts (e.g., lethality predictions). In support of dispersion and hazard prediction model validation, many of the fundamental NBC analytical tools, facility models, and inherent technical databases reached operational status during 1997. As a result, the community is sponsoring the development of a new class of decision analysis tools that combine the calculations from individual NBC tools, models, and databases in a comprehensive and complementary manner to assist analysts and decision makers with critical NBC hazard prediction decisions.

5.7.4 Other DoD Passive Defense Programs Strongly Related to Counter-proliferation. The Counterproliferation Support Program and the CBD Program are the focal points for Joint Service passive defense programs. DARPA BW defense R&D programs and DSWA RDT&E and Navy acquisition programs in nuclear weapons effects, safety, and survivability also contribute to the counterproliferation ACEs in passive defense. These programs are described below.

DARPA BW Defense Sensors Program. This program, managed by DARPA's Defense Sciences Office, is pursuing breakthrough technologies in biological detection. DARPA is developing technologies that will enable a multiplexing capability for bioagent identification. Technologies using up-converting phosphor technology, providing improved detection sensitivity, and enabling enhanced multiplexing are being developed that can reveal BW agent family, genus, and species on a single chip. A mass spectrometer is being miniaturized and ruggedized for battlefield use in identifying BW agents and contaminants without the use of liquids. These systems will be automated for unattended operations. Detection technologies that provide information on BW agent pathogenicity and viability are also being developed under the DARPA

biological detection program. Additional project details are provided in Table 5.8 and in Appendix C (Table C.7).

Consistent with the FY 1997 NDAA (Section 228), DARPA's BW Defense Program is not consolidated into the CBD Program but exists instead under separate program elements. Under a MoU with ATSD(NCB), DARPA works closely with the Counterproliferation Support Program, and its BW defense activities are closely coordinated with the CBD Program.

DARPA BW Defense Unconventional Pathogens and Advanced Diagnostics Programs. As one of the major program areas conducted under its Defense Sciences Office, DARPA is pursuing the demonstration and development of new BW defense capabilities. Major thrusts include medical countermeasures, advanced medical diagnostics for the most virulent pathogens and their molecular mechanisms, and consequence management tools. Medical countermeasures under development include multi-agent therapeutics against known, specific agents and therapeutics against virulence pathways (i.e., disease mechanisms) shared by broad classes of pathogens. Specific approaches include modified red blood cells to sequester and destroy pathogens, modified stem cells to detect pathogens and to induce immunity or produce appropriate therapeutics within the body, identification of virulence mechanisms shared by pathogens, development of novel therapeutics targeting these mechanisms, and efficacy testing in cell cultures and animals. Early diagnosis is key to providing effective therapy against BW agents since many of these agents cause early, nonspecific, flu-like symptoms. The goal of the diagnostics thrust is to develop the capability to detect the presence of infection by BW threat agents, differentiate from other significant pathogens, and identify the pathogen, even in the absence of recognizable signs and symptoms. The objective of the program's consequence management thrust is to provide comprehensive protocols to protect or treat combatants using current and emerging biological countermeasures. It will provide accelerated situational awareness of BW events by detecting exposure to agents through an analysis of casualty electronic theater medical records and will locate and determine the most effective logistical support for providing appropriate treatment and pathogen-specific resources required to mitigate effects of the BW attack. Current plans envision transitioning these software tools to Service customers beginning in FY 1999. Additional project details are provided in Table 5.8 and in Appendix C (Table C.7).

DSWA Nuclear Survivability Programs. DSWA has two programs to ensure the survivability of weapons systems in a nuclear environment: i) the Test and Simulation Technology Program which provides simulators and simulator technology to validate weapons systems survivability and operability in nuclear environments; and ii) the Weapons System Operability Program which provides force survivability assessments against nuclear weapons effects and develops nuclear hardened electronic components for military use. Key accomplishments over the past year for the Test and Simulation Technology Program include: i) demonstration of the technologies and completion of qualification testing for a new x-ray simulator (known as DECADE) to be located at the Arnold Engineering Development Center; and ii) consolidation of radiation test facilities for more efficient operation. Key accomplishments in the Weapon System Operability Program since last year's report are: i) completion of an operability assessment for USSTRATCOM's force direction, weapon systems, and C4I surveillance and reconnaissance; ii) completion of a radiation hardened Silicon-On-Insulator (SOI) and bulk 1 megabit static random access memory chip; iii) initiation of a Tactical Warning/Attack Assessment (TW/AA) operability

Table 5.8: Key DoD Counterproliferation Activities and Programs in Passive Defense

Program/Project Title	Project Description	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
CP Support Program • JBREWS ACTD	• Accelerate fielding of warfighting capabilities for remote detection, identification, characterization, and early warning of BW agent attacks	1, 9, 8	JPO-BD	31.790	603884BP
• Eye Safe LR-BSDS for BW Detection	• Accelerated deployment of airborne eye safe IR LIDARs for battlefield BW aerosol detection and tracking	1, 9	JPO-BD Army	11.275	603884BP
• RESTOPS Proposed ACTD	• Planning and analysis exercises to prepare for a FY 2000 ACTD start	9, 1	JPO-BD	1.942	603384BP
• BW Detection Advanced Technology Development	• Demonstration and rapid fielding of selected man-portable BW detectors for remote detection and characterization of BW agents	1, 9	JPO-BD DARPA NRL	5.431	603384BP
Strongly Related CP Programs • Chemical and Biological Defense Program*	• RDT&E and procurement of systems and equipment for NBC agent detection and warning, individual and collective protection, medical response (including vaccine R&D), and decontamination	9, 1, 10	ATSD (NCB) Services JPO-BD	530.049	601384BP 602384BP 603384BP 603884BP 604384BP 605384BP 208384BP
• BW Joint Vaccine Acquisition Program (part of the CBD Program)	• Dem/Val, EMD, and procurement to meet DoD BW vaccine production and stockpile needs	10	JPO-BD Army	35.070	603884BP 604384BP 208384BP
• Critical Reagents Program (part of the CBD Program)	• Provide management for critical reagents necessary for BW detection systems	1	JPO-BD	1.759	208384BP
• DARPA BW Defense Sensors Program	• Research, develop, and demonstrate technologies to minimize the impact of BW agents on future military operations	1, 9, 6	DARPA	15.000	602383E
• BW Defense Unconventional Pathogens and Advanced Diagnostics Program	• Develop new medical countermeasures, diagnostics, and consequence management technologies	1, 6, 9	DARPA	73.000	602383E
• DSWA Test and Simulation Technology	• Simulators and simulator technology to validate weapon systems operability in nuclear environments	9	DSWA	33.283	602715BR
• DSWA Weapon System Operability Program	• Force survivability assessments against nuclear weapons effects based on test results	9, 11 4, 7	DSWA	7.200	602715BR
• Navy RADIAC Program	• RDT&E and procurement of radiation detection and monitoring equipment for a variety of applications	9	Navy	3.600 4.035	603542N 82M2

* See Appendix C, Table C.2 for additional information.

assessment for U.S. Space Command; and iv) demonstration of a radiation-hard 0.35 micron copper metallic oxide semiconductor (CMOS)-SOI and bulk technology. Additional project details are provided in Table 5.8 and in Appendix C (Table C.8).

Navy RADIAC Program. The RADIAC Program (managed by Naval Sea Systems Command) is responsible for ensuring the availability of radiation monitoring instruments to support uses ranging from industrial radiography to operation and maintenance of nuclear propulsion plants, ships, submarines, and prototype facilities as well as medical applications and CW/BW and radiological defense. The instruments are used to ensure the safety of personnel and

the environment. Key accomplishments include production of the Multifunction RADIAC, continuation of a low-rate initial production contract for a laser heated thermoluminescent dosimeter (LHTLD) system, and transition to EMD for the Underwater RADIAC. Additional project details are provided in Table 5.8 and in Appendix C (Table C.4).

5.7.6 Near-, Mid-, and Long-Term Milestones for DoD Passive Defense Programs. Figure 5.5 summarizes the time-phased milestones of those passive defense programs discussed above and having clearly identifiable acquisition milestones.

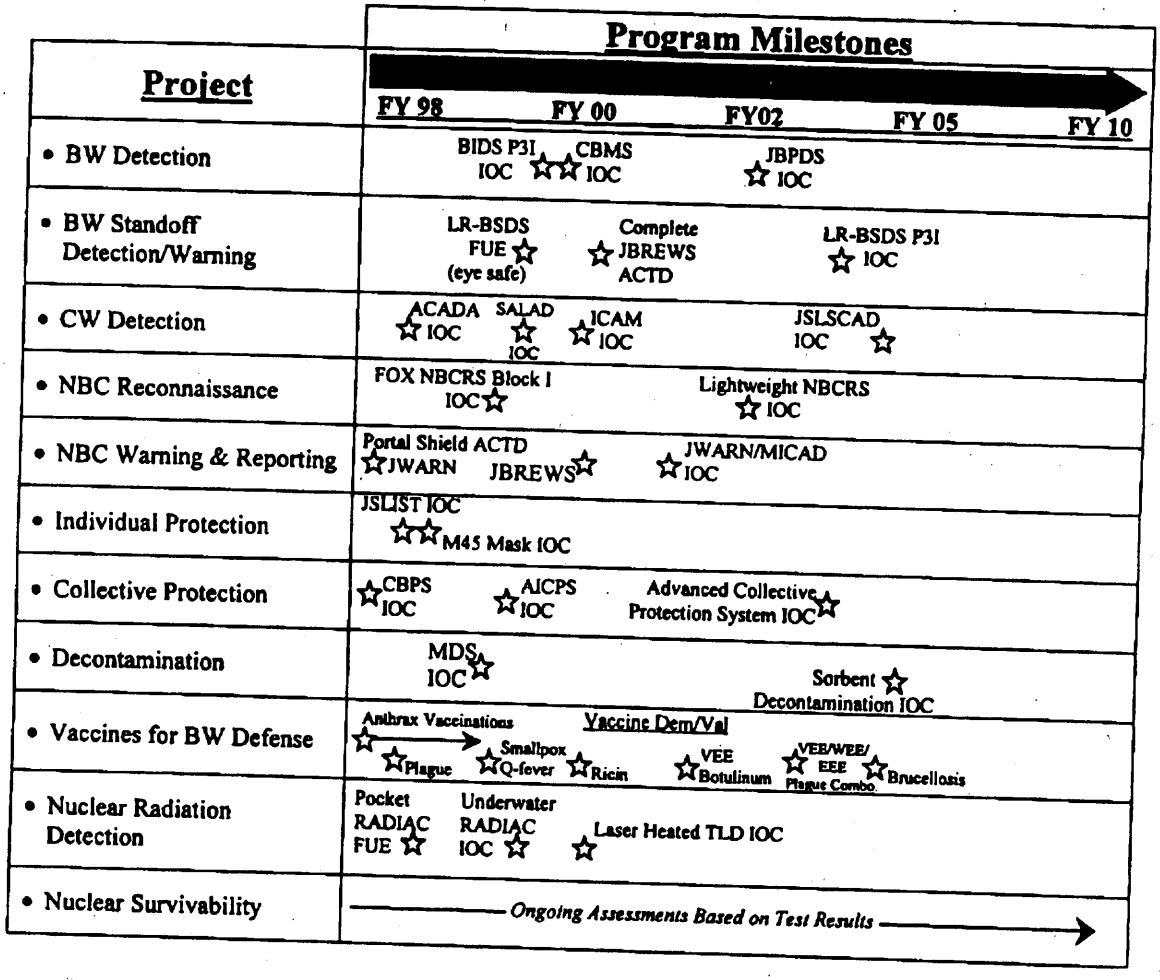

Figure 5.5 Time-Phased Milestones of Passive Defense Programs

5.8 Status and Accomplishments of DoD Staff Functions and Organizations

Defense Technology Security Administration. DTSA's mission is to develop and implement DoD policies regarding international transfers of dual-use and munitions items to ensure such transfers are consistent with U.S. national security interests. DTSA coordinates DoD's review of export licenses, referred by the Departments of State and Commerce, for their potential to contribute to the proliferation of NBC weapons, missile delivery systems, and other significant military capabilities. DTSA develops policies regarding the transfer of defense-related systems and technologies, participates in international export control negotiations, and provides technical support to diplomatic, intelligence, and enforcement efforts. Key accomplishments include: i) enhancement of the new multinational export control framework (i.e., the Wassenaar Arrangement); ii) review of over 21,000 export license applications for military and dual-use technologies; and iii) U.S. export control cooperation programs with other nations. Additional project details are provided in Table 5.9 below and in Appendix C (Table C.12).

Table 5.9: Key DoD Staff Functions and Organizations

Activity Title	Description	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
• DTSA Activities	• Develops and implements DoD policies regarding military and dual-use exports and coordinates DoD's review of export licenses	14	DTSA	10.560*	O&M

* FY 1999 budget may change when DTRA becomes operational in October 1998

5.9 Summary of DoD's Counterproliferation Response

Table 5.10 summarizes DoD's response to the counterproliferation ACEs by matching selected activity and program accomplishments to the primary DoD ACE priority they address.

Table 5.10: Highlights of DoD's Response to the Counterproliferation ACEs

DoD ACE Priority	Selected Accomplishments in DoD Counterproliferation Programs
1. Detection, Identification, and Characterization of BW Agents	• Developing the Joint Biological Point Detection System for all Services • Accelerated development of advanced early warning BW agent detection systems • Continuing the Portal Shield ACTD and the JBREWS ACTD • Continuing production of the Biological Integrated Detection System P3I to equip a second Army BW detection company
2. Detection, Characterization, and Defeat of NBC/M Facilities with Minimal Collateral Effects	• Conducted integrated sensor, weapon, and targeting tool field tests for NBC/M and underground facility defeat and collateral effects mitigation as part of the Counterproliferation CP1 ACTD • Initiated the follow-on Counterproliferation Counterforce CP2 ACTD • Agent defeat weapons system concepts collected from industry and DoD/DOE labs for evaluation
3. Detection, Characterization, and Defeat of Underground Facilities with Minimal Collateral Effects	• Initiated the joint DSWA/DIA Tunnel Defeat Demonstration Program, integrating intelligence, operational, and acquisition priorities for tunnel defeat • See ACE #2 entries above
4. Ballistic Missile Active Defense	• Several programs restructured to accelerate acquisition and reduce technical risk • Successful flight tests for PATRIOT PAC-3 missile and NMD kill vehicle concepts • Airborne Laser successfully completed PDRR Program Requirements Review and scaled laser tests; fabrication of the first laser module initiated • THAAD and Airborne Laser components exercised in various field exercises • Navy initiated actions to accelerate Navy Area TBMD ship deliveries within FYDP • National Missile Defense elevated to Major Defense Acquisition Program and Lead System Integrator contractor to be selected in May • SBIRS-High EMD contract for 5 satellites awarded and Preliminary Design Review completed • Theater ballistic missile defense lower-tier system procurement transitioned back to BMDO
5. Support for Special Operations Forces and Defense Against Paramilitary, Covert Delivery, and Terrorist NBC Threats	• Continued development of specialized technologies and equipment prototypes to assist SOF and Explosive Ordnance Disposal teams in countering CW/BW threats • Enhanced coordination of Joint Service exercises and readiness sustainment activities • Formed organizational structure and initiated facility assessments to enhance U.S. force protection
6. Provide Consequence Management	• Improved the Marine Corps Chemical Biological Incident Response Force • Provided consequence management training for First Responders to respond to CW/BW attacks • Provided satellite broadcast training on medical management of BW casualties • Establishing regional Army Special Medical Augmentation Response Teams
7. Cruise Missile Defense	• Technology sharing and synergy with ballistic missile defense programs is continuing
8. Collection, Analysis, and Dissemination of Actionable Intelligence to Counter Proliferation	• *Athena* counterproliferation intelligence "information space" under development to support mission planning and operations • See the Intelligence Annex to this report for additional programs
9. Robust Passive Defense to Enable Sustained Operations on the NBC Battlefield	• Continued deployment of critical NBC detection and warning, individual and collective protection, and decontamination systems for use throughout the battlespace • Continuing advances in CW/BW medical defense RDT&E • Additional funding for CW/BW defensive equipment to meet operational requirements
10. BW Vaccine RDT&E and Production to Ensure Stockpile Availability	• Prime systems contract awarded in November 1997 for the Joint Vaccine Acquisition Program • Fulfilled DoD prescribed stockpile level of anthrax vaccine • Decision to vaccinate U.S. forces against anthrax; vaccinations under way
11. Target Planning for NBC/M Targets	• User acceptance of integrated target planning and weaponeering tools by CINC USEUCOM for use in Bosnia as part of Operation Joint Endeavor along with other upgrades from the CP1 ACTD • CW/BW agent defeat assessment tools under development
12. Prompt Mobile Target Detection and Defeat	• Development of a foliage penetrating radar and other sensors to defeat camouflage, concealment and deception; new capabilities for near real-time exploitation of wide area imagery • Demonstrated operational utility of C4I systems for rapid dissemination of intelligence to users
13. Detection, Tracking, and Protection of NBC/M and NBC/M-Related Materials and Components	• Deployment of prototype Specific Emitter Identification System for identifying ships at sea suspected of transporting NBC/M or related materials; fleet integration via upgrades of existing signal processors with an SEI capability scheduled for FY 1999.
14. Support Export Control Activities of the U.S. Government	• Reviewed over 21,000 export license applications for military and dual-use technologies • Enhanced the "Wassenaar Arrangement," a new multinational export control framework • Militarily Critical Technologies List Part II, *WMD Technologies*, published
15. Support Inspection and Monitoring Activities of Arms Control Agreements and Regimes	• Helped Ukraine, Belarus, and Kazakhstan to become non-nuclear weapons states • Technology R&D for CW/BW arms control treaty implementation, monitoring, and verification • Continued inspection, monitoring, and escort support for NBC weapon arms control treaties • Eliminated 84 SLBM launchers, dismantled 255 ICBMs and 37 heavy bombers, and sealed 117 of 194 nuclear weapons test tunnels and bore holes in FSU states • Consolidated funding of R&D programs under DSWA to improve CTBT implementation • Continued development of a global continuous threshold monitoring network and data fusion knowledge base and communications network for CTBT verification

6. DOE Nonproliferation Programs

DOE nonproliferation programs related to countering proliferation are described in this section. DOE counterterrorism activities are discussed in Section 8.4. These efforts include its chemical and biological agent detection R&D program and key proliferation prevention activities to limit the spread of nuclear weapons, materials, technologies, and expertise. Key accomplishments since last year's report are also summarized.

6.1 Introduction: Relevant ACEs and DOE Policy Objectives

DOE strongly supports the counterproliferation missions of DoD and U.S. Intelligence primarily through its nuclear proliferation prevention activities. DOE plays a critical role, through its core nuclear work, in addressing ACE priorities in the detection, tracking, and protection of NBC weapon-related materials and components (DOE ACE priority 1); defending against and responding to paramilitary, covert delivery, and terrorist NBC threats through its Nuclear Emergency Search Team (DOE ACE priorities 2 and 4); by supporting inspection and monitoring activities of arms control agreements and regimes (DOE ACE priority 5); and by supporting U.S. government export control activities (DOE ACE priority 9). In addition to its core nuclear nonproliferation activities, DOE began its Chemical and Biological Nonproliferation Program in 1997, which supports the detection, identification, and characterization of BW agents (DOE ACE priority 3). Building on its experience from its extensive "work for others" program, DOE is working closely with DoD and U.S. Intelligence to detect, characterize, and defeat NBC/M and underground facilities (DOE ACE priorities 6 and 8) and to detect and characterize worldwide nuclear proliferation (DOE ACE priority 7). DOE is requesting $515.2 million in FY 1999, compared to $489.4 million in FY 1998, for nonproliferation and proliferation prevention programs (a 5% increase). DOE's budget breakdown for FY 1999 is provided in Appendix D.

To reduce the international proliferation threat, DOE focuses its resources and expertise on the following near-term priorities:

- Detecting and characterizing worldwide production of nuclear materials and weapons;
- Monitoring worldwide nuclear testing;
- Preventing and detecting the diversion or smuggling of nuclear materials;
- Securing nuclear materials, technology, and expertise in Russia and the FSU states;
- Preparing for, detecting, and responding to events involving CW and BW agents;
- Limiting weapons-usable fissile materials worldwide;
- Promote transparent and irreversible arms reductions of global nuclear stockpiles;
- Controlling nuclear exports;
- Strengthening the nuclear nonproliferation regime; and
- Maintaining and continuously improving a program for nuclear emergency and nuclear terrorism response.

Key Accomplishments. Over the past year, DOE has achieved major successes in a number of areas, including:

- *Assisting Russia, the FSU States, and the Baltics.* During FY 1997, site security upgrades were under way at 33 facilities in Russia and 13 additional sites in FSU states and the Baltics that use or store weapons-usable highly enriched uranium or plutonium. Commissioning ceremonies took place at three new sites: the Kiev Institute of Nuclear Research (Ukraine); the Institute of Atomic Energy at Kurchatov (Kazakhstan); and at Ulba (Kazakhstan). Five additional Russian sites were completed in 1997. During FY 1997, the U.S. Secretary of Energy and Russian Minister Mikhailov signed a joint statement to add an additional facility in Lytkarino; the Krylov Ship Building Research Institute in St. Petersburg, Russia, was added to the Cooperative Program; and major physical protection upgrades for a "first fresh fuels" storage site of the Russian Northern Fleet was completed.

- *Limiting Weapons-Usable Fissile Materials Worldwide.* Significant progress was made in limiting weapons-usable fissile materials, most notably by the near completion of an extraordinary effort to freeze the North Korean nuclear program through the canning of 8,000 spent nuclear reactor fuel rods. DOE also concluded a contract for the second year of work on cooperative Reduced Enrichment Research Test Reactors with Russian labs.

- *Establishing Transparent and Irreversible Nuclear Reductions Worldwide.* The ground-breaking DOE technical report, entitled *Transparency and Verification Options: An Initial Analysis of Approaches for Monitoring Warhead Dismantlement,* was issued in May 1997. Successful technology demonstrations were conducted at the Oak Ridge National Laboratory in October 1996 to familiarize Russian technical experts with the U.S. enrichment and flow measurement technology being installed at Russian facilities associated with the U.S.-Russian Highly Enriched Uranium Purchase Agreement. In late 1996, a Russian familiarization visit took place at the Oak Ridge Y-12 Plant, together with a reciprocal U.S. familiarization visit to Seversk (Tomsk-7). During these visits, both U.S. and Russian technical experts successfully demonstrated – for the first time – unclassified radiation measurements on actual U.S. and Russian highly enriched uranium weapons components removed from dismantled nuclear weapons and contained in sealed storage containers. Another Russian visit took place at the Lawrence Livermore National Laboratory in November 1996, during which U.S. and Russian technical experts successfully performed joint radiation measurements on unclassified plutonium sources in sealed containers that allowed the merits of various radiation measurement techniques for monitoring U.S. and Russian inventories of plutonium removed from dismantled nuclear weapons to be evaluated.

- *Strengthening the Nuclear Nonproliferation Regime.* In November 1997, the U.S. and the IAEA began the first joint verification experiment at the Portsmouth Gaseous Diffusion Plant where the down blending of 13 metric tons of U.S. excess highly enriched uranium was begun in 1995. This effort represented the first time that international monitors witnessed a nuclear-weapons state (the U.S.) take weapons-usable uranium from its military program and transform it into fuel for heating homes and lighting cities. The monitoring of this process by the IAEA fulfilled the Secretary of Energy's commitment, made at the IAEA General Conference, to demonstrate America's commitment to make our nuclear reductions open, secure, and irreversible. "Turning megatons to megawatts" constitutes another important step in U.S. efforts to reduce the nuclear legacy of the Cold War. In support of an IAEA Action Team and UNSCOM, the Department provided 11 technical experts during 1997 to assist the

Action Team in conducting intrusive inspections in Iraq. During the course of these inspections, water sampling equipment, ground penetrating radar, and other electromagnetic sensors were deployed. DOE continued to provide a full-time nuclear expert to UNSCOM to serve as a nuclear advisor to the Executive Chairman of UNSCOM and as nuclear liaison between UNSCOM and the IAEA Action Team.

- *Controlling Nuclear Exports.* The DOE-developed Nuclear Suppliers Group Information Sharing System, an encrypted international computer network, was officially adopted by the Nuclear Suppliers Group. The Department participated in cooperation with the U.S. Customs Service to train several hundred customs inspectors and export control officials on nuclear nonproliferation issues, including strategic material identification and illicit trafficking prevention to improve the export control systems of the FSU states, Eastern Europe, and UNSCOM in Iraq. DOE increased the number of export control lab-to-lab programs from six to nine, while also conducting industry outreach seminars in Russia in conjunction with the Russian Ministry of Atomic Energy (MINATOM).

DOE also undertakes various activities, as a member of the intelligence community, related to nuclear proliferation intelligence data analysis and treaty monitoring. DOE nonproliferation and proliferation prevention activities are discussed in this section. Joint DOE/U.S. Intelligence activities are discussed in the Intelligence Annex to this report.

6.2 Status and Accomplishments of DOE Proliferation Prevention Programs

6.2.1 Detecting and Characterizing Worldwide Production of Nuclear Materials and Weapons. DOE, in support of DOE ACE priority 1, continued development of both remote and on-site complementary tools to detect and characterize foreign nuclear materials production activities. Acquisition of special nuclear materials is the most important step for a potential nuclear weapons proliferator to accomplish. The ability to detect production is, therefore, a critical proliferation prevention capability, and the ability to detect such production remotely is a powerful deterrent to proliferation. The CALIOPE (Chemical Analysis by Laser Interrogation Of Proliferation Effluents) program is a major remote sensing effort focused on providing such a capability. The CALIOPE program is composed of a multi-laboratory team with the goal of perfecting laser-based remote sensing techniques for trace chemical effluent detection. The CALIOPE system will eventually consist of an airborne sensor system for the detection of chemical species in environments indicative of nuclear materials production. A highlight planned for FY 1999 is another DoD/DOE collaborative airborne experiment using the Air Force ARGUS aircraft. This experiment will demonstrate a solid state mid-wavelength IR lidar system.

DOE is also developing a hyperspectral infrared imaging spectrometer for detecting effluents associated with nuclear materials production processes. This sensor was successfully ground tested at the Nevada Test Site in FY 1997 and will undergo initial airborne checkout in FY 1998 leading to a full-scale airborne demonstration in FY 1999. Other nuclear weapons clandestine production detection efforts are focused on the development of a small satellite demonstration system employing multispectral infrared imaging techniques. These imaging techniques are useful to detect and monitor such production indicators as reactor cooling pond

temperatures, which can be used to estimate plutonium production rates. The system is scheduled for launch in FY 1999 on board an Air Force Space Test Program launch vehicle. Multispectral change detection also can be useful in detecting undeclared production-related facilities and activities. Over the past year, satellite systems integration was started and substantial progress was made on an end-to-end modeling system that will aid in extracting facility power estimates from thermal signatures. These efforts exploit a unique combination of DOE National Laboratory expertise in the nuclear weapons production cycle, production signatures, laser systems, rapid prototyping, and satellite systems engineering. Planned funding for production detection activities in FY 1999 is $66.3 million compared to $66.8 million in FY 1998.

6.2.2 Monitoring Worldwide Nuclear Testing. DOE, in support of DOE ACE priority 5, continued to develop and deploy elements of U.S. capabilities for monitoring the Limited Test Ban Treaty (LTBT) and the CTBT. DOE has a long standing partnership with DoD in this area, with DOE designing and producing nuclear detonation detection sensor systems for deployment on DoD GPS and Defense Support Program (DSP) satellites (see subsection 5.2.4). These systems include optical, x-ray, gamma ray, neutron, and electromagnetic pulse (EMP) sensors. During the past year, DOE delivered four GPS payloads and provided the first operational instrument combining the x-ray sensor and the environmental dosimeter for the GPS. This reduces configuration control issues and provides these sensors on all GPS satellites. A significant accomplishment last year was the launch of a prototype satellite in August 1997 to demonstrate an autonomously triggered, non-deniable, all-weather EMP sensor system, and to gain a better understanding of naturally occurring radio frequency events.

Ground-based technical methods associated with the CTBT, and specifically intended for the International Monitoring System, involve hydroacoustics, seismology, radionuclide detection and characterization, and infrasound techniques. DOE is developing sensors that meet IMS specifications. The primary focus of the seismic studies is to characterize regional areas of interest to improve the capability to detect smaller and potentially evasive nuclear weapon tests. During the past year, DOE continued to develop a database of germane signals from earthquakes, nuclear events, and high explosive events in China and the Middle East/North Africa region to aid in the detection and identification of possible nuclear tests from other man-made or natural events. Data analysis as well as algorithm and automated data processing development continue and draw on National Laboratory experience in nuclear testing, mining and seismic geology, field measurements, and data fusion.

Last year, DOE completed a prototype infrasound station for eventual commercial production and possible inclusion in the IMS. DOE National Laboratory experience in atmospheric science is especially relevant to this activity. Hydroacoustic monitoring provides yet another complementary tool to detect low yield, potentially evasive testing. DOE also developed the specifications for an ocean monitoring system. Radionuclide techniques offer another important tool by providing critical forensic data to support CTBT verification. DOE developed and transitioned an automated radionuclide particulate detection system to the Air Force, which is now acquiring the system from a commercial vendor. This year DOE will also provide a prototype automated xenon gas detector system to the Air Force for commercialization and use by the IMS. DOE works closely with DoD to support CTBT verification activities. Planned funding for nuclear test monitoring activities in FY 1999 is $81.2 million, unchanged from FY 1998.

6.2.3 Preventing and Detecting the Diversion and Smuggling of Nuclear Materials. DOE's efforts to prevent and detect nuclear smuggling (DOE ACE priorities 1 and 7) are focused on securing nuclear material at its source, detecting stolen material in transit, responding to threatened and actual events, and determining the origin of intercepted material. Extensive DOE efforts are focused on protecting domestic nuclear materials and combating smuggling by securing potential sources of material in the U.S. Similar efforts in protecting nuclear materials worldwide are described in the next several sections. To deal with materials in transit, DOE works closely with DoD, U.S. Intelligence, and others in the interagency community providing technology support for detection and interdiction of stolen nuclear materials. In addition, DOE and National Laboratory personnel lead an international technical working group to help determine the sources of smuggled nuclear material by applying the full scope of laboratory forensic methods on intercepted materials. This program exploits multiple DOE expertise in environmental and nuclear material production signatures, radiochemical analysis, and law enforcement support. In late 1997, the "Second Line of Defense" program, aimed at improving Russian border detection capabilities and preventing nuclear materials, high explosives, and other dangerous substances from exiting the country, was begun. This program is envisioned as a mechanism for training Russian Federation officials on sound customs practices and procedures, including training for utilizing various detection equipment. Planned funding for these activities in FY 1999 is $43.5 million, unchanged from FY 1998.

6.2.4 Detecting Chemical and Biological Agents. In FY 1997, directly in response to congressional direction and a CPRC recommendation to establish a joint DOE, DoD, and U.S. Intelligence R&D initiative in chemical and biological defense, DOE began its chemical and biological agent detection R&D program. Funding to initiate the program was provided in the Nunn-Lugar-Domenici amendment to the FY 1997 NDAA. DOE was recognized for its long-standing and preeminent R&D programs in the basic chemical sciences, life sciences, and biotechnology in support of both traditional DOE missions (such as nuclear weapons production, production cleanup and environmental remediation, and occupational health and safety) and its Human Genome Project. As a result, the program is focused on leveraging these capabilities, the sensor technologies developed in the nuclear nonproliferation program, and in numerous "work for others" projects to support CW/BW defense and counterproliferation efforts. Both DoD and U.S. Intelligence have long drawn on DOE National Laboratory capabilities in a broad range of areas through the "work for others" process (through which other organizations can tap DOE National Laboratory capabilities). Such activities are focused on critical near-term defense requirements.

The CW/BW R&D program is coordinating the application of technology developments arising from these efforts to meet various CW/BW defense and counterproliferation needs identified by users from across the interagency community. The program is focusing its activities in four thrust areas: fundamental biology, prediction, detection, and mitigation. The fundamental biology area includes the genomic sequencing of priority pathogens, understanding structure/function relationships for biotoxins, and the development of tools for epidemiological monitoring. In the area of prediction, the program is focusing on the development of atmospheric transport models for use in complex urban terrain (including, for example, the interior of structures and subways). CW/BW detection activities center on the development of DNA-based technologies for bacterial agent detection and microseparation technologies for biotoxins and CW agents. The mitigation effort is concentrating on developing rapidly deployable, environmentally

benign CW/BW decontamination technologies. DOE has budgeted $19.0 million in FY 1998 and is requesting $19.0 million in FY 1999.

DoD and, to a lesser extent, other government agencies are sponsoring approximately $30 million in CW/BW detection technology development at the National Laboratories. This work is primarily focused on expanding sensor capabilities, finding near-term solutions to the demilitarization of CW munitions stockpiles, and enhancing strategic and tactical intelligence collection and battlefield surveillance. Nonproliferation technology development undertaken by DOE for its nuclear mission, but which at the scientific level is also directly applicable to CW/BW counterproliferation, amounts to approximately $70 million out of the $210 million DOE verification and control technology R&D program. The National Laboratories annually conduct approximately $1 billion in biotechnology and chemical sciences research involving such activities as studies of toxicological effects, development of new and miniaturized chemical and biological sensors, remote measurement and sensing of chemical and biological species, development of chemical and biological remediation techniques, and development of advanced chemical and biological laboratory analytical methods. This program is, therefore, well positioned to leverage this extensive technology base.

6.2.5 Securing Nuclear Materials, Technology, and Expertise in Russia, States of the FSU, and the Baltics. Two DOE programs comprise the majority of this activity: the Material Protection, Control, and Accounting program and the Initiative for Proliferation Prevention (IPP). The MPC&A program is primarily related to nuclear materials security and nonproliferation, and the goal of the IPP is to engage scientists and engineers from the weapons institutes of the FSU in peaceful technology applications in order to help stabilize personnel and resources that represent a potential risk of "expertise proliferation." Funding requested for FY 1999 is $152.3 million for the MPC&A program and $15 million for the IPP program, unchanged from FY 1998.

The MPC&A Program. Material protection, control, and accounting cooperative upgrade programs are now under way at over 50 locations in Russia and seven other FSU states, representing all of the known locations possessing weapons-useable nuclear materials. The hundreds of tons of plutonium, uranium, and other weapons-useable nuclear materials produced during the Cold War are enough to make tens of thousands of nuclear weapons. Employing the latest commercially available technology in new door and vehicle monitors, physical barriers, alarms, and bar code systems to track and inventory nuclear materials, DOE's MPC&A Program is providing a first line of defense against nuclear smuggling and terrorism through systematic and rapid MPC&A upgrades that compare favorably with U.S. and international safeguards. DOE will continue to negotiate formal MPC&A agreements for each FSU site identified as containing at-risk weapons-usable nuclear material. These efforts aim to reduce, if not prevent, the possibility of nuclear smuggling.

DOE is also working with governments and institutions of the FSU countries to strengthen their export control systems and, thereby, stem the illicit flow of nuclear materials, equipment, and technology. Much of this effort is accomplished at the grass-roots level through laboratory-to-laboratory cooperative programs in export control. The objective is to engage their scientific community in their own national export control systems, in the same way as the expertise of the DOE National Laboratories serves the U.S. government. DOE is also identifying and training

technical experts in the FSU in how government agencies can administer export controls. DOE laboratories explain how to provide expert technical advice to the agencies, how to review export license applications, and what to be alert for in the export control arena.

The Initiative for Proliferation Prevention. As previously noted, the primary objective of the IPP is to stabilize personnel associated with NBC weapon programs within the FSU to minimize the risk of the proliferation of NBC weapons expertise. The IPP program draws scientists, engineers, and technicians from FSU NBC weapons programs into commercial ventures, avoiding potential "brain drain" to would-be proliferants and providing long-term employment in non-weapons work. Under the IPP, DOE National Laboratories work with Russian and FSU institutes to identify and evaluate the commercial potential of various products related to R&D activities conducted at those institutes. Cooperative projects between U.S. laboratories, corporations, universities, and the nuclear inheritor states of the FSU reflect a nonproliferation program with a true commercial strategy – a strategy that has engaged many institutes and hundreds of personnel in real commercial enterprises. Under new leadership, the program has undergone a transition with a renewed vision to provide meaningful non-weapons-related work for FSU weapons scientists with an additional focus on encouraging commercial enterprise development within FSU states and enhancing the position of U.S. industry in the emerging FSU marketplace. While engaging weapons scientists, engineers, and technicians at FSU institutes in nonmilitary projects, IPP projects stabilize the technology base at key institutes and involve private sector investment to help accomplish the nonproliferation goals of the U.S. government.

6.2.6 Reducing Inventories of Surplus Weapons-Usable Fissile Materials Worldwide in a Safe, Secure, Transparent, and Irreversible Manner. Efforts in 1998 will focus on implementing the disposition of surplus highly enriched uranium and plutonium and providing technical support to attain reciprocal actions for the disposition of surplus Russian plutonium. Multinational cooperation is already under way to minimize the future demand for highly enriched uranium in civilian programs through the development of alternative low enriched uranium fuels for research reactors. Funding requested for these activities in FY 1999 is $21.7 million, compared to $19.9 million in FY 1998.

6.2.7 Strengthening the Nuclear Nonproliferation Regime. The Department will lead, via joint chairmanship, an interagency task force on warhead and fissile material to create START III options for warhead elimination and fissile material disposition. DOE will continue its support to the IAEA and UNSCOM by providing equipment, technologies, and expertise to perform monitoring and intrusive inspections in North Korea and Iraq sufficient to verify compliance with their obligations under the Nonproliferation Treaty. In support of the CTBT, DOE will work toward finalizing a plan for joint cooperation with the Russians in conducting joint confidence-building activities. In anticipation of completing the canning of 8,000 spent nuclear reactor fuel rods, DOE will focus its efforts in North Korea on long-term spent fuel maintenance. Funding requested for this activity in FY 1999 is $38.2 million, up from $34.4 million in FY 1998.

6.2.8 Minimizing the Risks of Proliferation. As previously mentioned, DOE will continue its aggressive cooperative materials protection, control, and accounting upgrades at each of the 53+ facilities in Russia, the FSU states, and the Baltics that use or store weapons-usable nuclear material. The IPP program will continue 12 commercial development projects at 6

primary CW/BW research and production facilities in Russia and Kazakhstan engaging an estimated 80 weapons experts. The IPP will also develop and implement 30 commercial development projects at nuclear weapons research and production facilities in Russia, Ukraine, and Kazakhstan engaging approximately 1,000 weapons experts. The Department will complete technical assistance initiatives in Russia, Ukraine, and Kazakhstan in 1998 and develop a cadre of export control and technical advisers on supplier policy and nuclear transfer activities.

6.2.9 Nuclear Emergency and Terrorism Response. DOE maintains several emergency response assets postured to respond to events that may occur should proliferation prevention efforts fail. DOE conducts analyses and provides operational and technical support in response to nuclear emergency and terrorism events worldwide. This includes the Nuclear Emergency Search Team which has primary responsibility for responding to acts of nuclear terrorism or other incidents involving nuclear weapons or devices. It can be deployed under the authority of the FBI for domestic incidents and the Department of State for foreign incidents. Requested funding for DOE emergency management and response programs in FY 1999 is $48.3 million, up from $41.1 million in FY 1998. Additional details are provided in Section 8.4.

6.3 DOE Technologies Developed to IOC

Except for the specific portions of the satellite nuclear detonation detection activities for nuclear test monitoring (discussed in Section 6.2.2), DOE-developed technologies are not normally taken to initial operating capability (IOC). Under DOE technology development activities, the end product is a capability demonstration of a system or method, most commonly in the form of a field-capable prototype, developed in direct response to requirements identified by a user agency (e.g., DoD or U.S. Intelligence). It is at this stage in the hardware development cycle that DOE program managers encourage and participate in the transfer of the technology product to the user community for field hardening, engineering refinements, and production.

DOE currently produces satellite-based sensors for the national capability to monitor and verify compliance with the LTBT and the CTBT. These sensors are secondary payloads on the GPS and DSP satellites (as described in subsection 6.2.2). DOE is developing the next generation of improved optical and electromagnetic pulse sensors to provide a better capability to monitor the continuation of the LTBT and to enable the U.S. to monitor and verify the CTBT after entry-into-force. The sensor systems under development are planned to go from development, through IOC, to production to meet required delivery dates for the next generation of GPS satellites. In addition to these satellite systems, DOE is also developing ground based components for airborne radionuclide sampling systems and is heavily involved in supporting DoD and other agencies of the U.S. government in identifying reliable commercial suppliers.

7. U.S. Intelligence Programs to Counter Proliferation

In this section, U.S. Intelligence activities and programs to counter proliferation, including strategic and operational planning processes, are briefly described, along with some intelligence successes achieved to date. Additional, more detailed information may be found in the Intelligence Annex to this report.

7.1 Introduction: Relevant ACEs and U.S. Intelligence Strategy Objectives

U.S. Intelligence has received clear and concise policy guidance for conducting its intelligence activities. This guidance begins with Presidential Decision Directives that address weapons and related technology proliferation, including, for example, nuclear smuggling. Additional guidance comes from annual congressional Defense and Intelligence Authorization and Appropriation Acts, reports to Congress by U.S. government agencies on countering proliferation activities, and DoD counterproliferation policy and military mission objectives. These outline a national nonproliferation strategy centered around four key aspects: i) prevent the acquisition of NBC/M; ii) roll back existing NBC/M capabilities; iii) deter NBC/M use; and iv) adapt military forces and emergency assets to respond to NBC/M threats.

A focused set of enduring intelligence needs has been developed in response to the policy guidance reflected in the four aspects of U.S. nonproliferation strategy cited above. These enduring intelligence needs are used to chart the progress of U.S. Intelligence in making use of existing capabilities and in defining and developing areas for new investments.

U.S. Intelligence is working to provide accurate, comprehensive, timely, and actionable foreign intelligence on a broad policy and enforcement front. This has included:

- Supporting policymakers responsible for extending and implementing nonproliferation regimes;
- Supporting efforts to counter the threat posed by biological and chemical weapons; and
- Maintaining a surge capability to quickly deploy specialists outside the U.S. to the scene of a terrorist nuclear or radiological threat to provide the U.S. Mission and host government advice and guidance on dealing with the threat. (During such an incident, the specialists would coordinate fully with the appropriate U.S. government agencies, keeping them informed and drawing upon their expertise should follow-up action be required.)

Strategic Planning Process. U.S. Intelligence has instituted a corporate strategic planning and evaluation process to support efforts to counter proliferation. This process contributes to the Intelligence Community's National Needs Process and the National Foreign Intelligence Program (NFIP), the Joint Military Intelligence Program (JMIP), and the Tactical Intelligence and Related Activities (TIARA) Program and Planning Guidance. A major benefit of this effort has been the

placement of a significant number of DoD personnel within the DCI's Nonproliferation Center. This has helped integrate intelligence support to DoD counterproliferation needs and actions. U.S. Intelligence also has expanded its relations with the law enforcement community. Both the FBI and the U.S. Customs Service have assigned senior agents to the NPC to assist in developing initiatives to counter proliferation activities. The NPC is also working to enhance information sharing technologies and resources in support of the law enforcement community's nonproliferation efforts.

As the threat of proliferation has increased, U.S. Intelligence capabilities to support nonproliferation efforts have been redirected or expanded and now include:

- Ongoing efforts to increase the ability to provide intelligence on the biological and chemical weapons threat;
- Assessing the intentions and plans of proliferating nations;
- Identifying NBC/M programs and clandestine transfer networks set up to obtain controlled materials or launder money;
- Supporting diplomatic, law enforcement, and military efforts to counter proliferation;
- Providing direct support for multilateral initiatives and security regimes; and
- Overcoming denial and deception practices established by proliferators to conceal their programs.

U.S. Intelligence has taken or participated in actions to address the overall challenges facing U.S. nonproliferation efforts, including:

- Identifying funds to maintain technical intelligence collection programs related to NBC/M tests;
- Fostering the development of new technologies with the potential to improve the ability to detect NBC/M activities at significantly longer ranges than possible today;
- Establishing relationships to enhance cooperation between U.S. Intelligence and R&D components;
- Redirecting and reorganizing intelligence activities to increase and sharpen the focus of nonproliferation-related efforts, both analytically and operationally; and
- Redirecting programs to assist the FBI and U.S. Customs Service efforts to identify, target, and apprehend individuals engaged in the trafficking and smuggling of nuclear materials worldwide.

Operational Planning Process. DIA is linking counterproliferation intelligence production more directly to the *CINC's CONPLAN 0400* planning process. DIA is taking guidance from the Joint Strategic Capabilities Plan and direction from the CINCs' J-2s, J-3s (Operations), and J-5s, enabling U.S. Intelligence to more clearly define and satisfy the intelligence requirements necessary to support CINC counterproliferation contingency planning and operations.

Intelligence Successes to Date. Many of U.S. Intelligence's successes cannot be described in this unclassified setting. The Intelligence Annex to this report contains a more thorough discussion of the activities and successes of U.S. Intelligence. However, some that can be described here include:

- Support to DOS efforts providing actionable intelligence to UNSCOM inspection and monitoring activities in Iraq;
- Continued efforts to provide law enforcement officials with indicators that CW and BW are about to be used;
- Support to congressional committees, including a report that reviewed and evaluated nonproliferation programs in the National Foreign Intelligence Program FY 1998 budget submission; and
- Refining a detailed set of information needs, known as the *Nonproliferation: Compendium of Country-Specific Priority Intelligence Needs and Actions,* to guide intelligence collection and analysis.

But even if all of the intelligence accomplishments could be listed, the intelligence community recognizes that there is more to do. Over the next year, U.S. Intelligence will continue to:

- Strengthen and focus its integrated collection strategy;
- Work to enhance the intelligence community's information processing capabilities;
- Implement unified and standardized information systems, to include shared access by intelligence and consumer organizations;
- Strengthen and broaden foreign language training and support tools;
- Review and evaluate new methodologies and technologies; and
- Evaluate intelligence resources and capabilities for optimal support for actions to counter proliferation as part of the DCI and Secretary of Defense joint program and budget reviews.

The danger of NBC use is taken seriously throughout the U.S. government. It has not been long since the poison gas attack in the Tokyo subway. Intelligence is the key. U.S. Intelligence has added resources to its efforts over the last few years as the threat has increased, and it will continue to do all it can to meet the needs of its policy, defense, and enforcement customers and to protect the American public at home and abroad.

7.2 Status and Accomplishments of U.S. Intelligence Programs to Counter Proliferation

Descriptions of the status and accomplishments of U.S. Intelligence programs to counter proliferation, including details of new initiatives and an overview of capability shortfalls and areas for progress, can be found in the Intelligence Annex to this report. One new initiative, the DRAGON FURY/Athena project, is described below.

DRAGON FURY/Athena. DIA, in collaboration with no fewer than 13 organizations in the intelligence community, DoD, DOE, and several national laboratories, is addressing the need for a comprehensive integrated counterproliferation "information space" to support defense policymakers, force planners, and combatant commanders in their counterproliferation planning and mission execution activities. This shared information space, called *Athena* (after the Greek goddess of wisdom), is managed by the DRAGON FURY joint program office. Not only will Athena contain substantive intelligence information, but it will also provide NBC warfare tutorials, "find the expert" and chat mode features, and modeling tools for use by operators. The DRAGON FURY joint program office is now in the process of reviewing intelligence consumer requirements, developing core products, revalidating the tool set required to optimize the analytical processes inherent in Athena, and addressing key interoperability and connectivity issues.

8. DoD, DOE, and U.S. Intelligence Programs for Countering Paramilitary and Terrorist NBC Threats

This section provides descriptions of the R&D and acquisition programs and related activities of DoD, DOE, and U.S. Intelligence to counter paramilitary and terrorist NBC threats, including new interagency initiatives to deal with these threats.

8.1 Introduction: Relevant ACEs and Policy Objectives

The activities and programs described in this section respond to the ACE priorities associated with supporting special operations forces (SOF) activities and defending against paramilitary, covert delivery, and terrorist NBC threats (DoD/U.S. Intelligence ACE priority 5 and DOE ACE priority 2) and with providing consequence management for terrorist incidents involving NBC weapons effects and the release or dispersal of NBC agents (DoD/U.S. Intelligence ACE priority 6 and DOE ACE priority 4), including providing assistance and support to "First Responders." First Responders are those local, state, and federal authorities that have crisis and consequence management responsibilities in the event of a domestic NBC terrorism incident and who are typically the first to arrive on the scene.

The U.S. policy with regard to combating terrorism is set forth in a Presidential Decision Directive signed in June 1995. The document, titled "U.S. Policy on Counterterrorism," states that the United States regards all terrorist attacks against its citizens or facilities, whether they occur within U.S. borders or overseas, as a "potential threat to national security as well as a criminal act and will apply all appropriate means to combat it." In it, the President directs department and agency heads to take appropriate steps to reduce our vulnerability to terrorists, to deter and respond to terrorist acts, and gives the "highest priority to developing effective capabilities to detect, prevent, defeat and manage the consequences of NBC materials or weapons use by terrorists." In the area of response to terrorist acts, the PDD reaffirms existing lead agency responsibilities in countering terrorism. The Department of State is the lead agency for international terrorist incidents taking place outside of U.S. territory, and the FBI is the lead agency within U.S. territory (unless otherwise directed by the Attorney General) while FEMA is responsible for ensuring that the Federal Response Plan is adequate to provide consequence management in the event of a domestic, NBC-related terrorist incident. DoD is responsible for providing support as required to the FBI and its Domestic Emergency Support Team in the case of crisis management and to FEMA for consequence management. More specific details on interagency efforts to combat NBC-related terrorist incidents are provided in the rest of this section.

8.2 Interagency Initiatives to Counter Paramilitary and Terrorist NBC Threats

8.2.1 Interagency Domestic Preparedness Initiatives. Subtitle A, "Domestic Preparedness," of the Defense Against Weapons of Mass Destruction Act of 1996 (Public Law No. 104-201, Secs. 1411-1417, 110 Stat. 2717-2725, 1996) directs the President to: i) enhance the capability of the federal government to prevent and respond to terrorist incidents involving NBC

weapons; ii) provide enhanced support to improve the capabilities of state and local emergency response agencies to respond to such incidents; and iii) develop and maintain a DoD domestic terrorism rapid response team capable of aiding federal, state, and local officials in detecting, neutralizing, containing, and dismantling CW/BW. The Senior Interagency Coordination Group facilitates interagency coordination of policy issues and program activities for consequence management initiatives. This group includes representatives from the Departments of Defense, Energy, Justice, Health and Human Services, Transportation, and Agriculture, the Environmental Protection Agency, and the General Services Administration. DoD has allocated $49.9 million in FY 1999 to enhance emergency domestic preparedness and response to terrorist NBC attacks. Under the leadership of ASD(SO/LIC), DoD is implementing the following activities:

- *Domestic Emergency Response Preparedness.* The Secretary of the Army has been designated by DoD as the Executive Agent responsible for developing and implementing the Domestic Preparedness program with the Director of Military Support (DOMS) serving as his Staff Action Agent and the Chemical and Biological Defense Command (CBDCOM) serving as the program director. Activities completed in FY 1997 include: trained over 3,000 local officials and first responders from several major metropolitan areas including New York City, Los Angeles, Chicago, Philadelphia, Boston, and Detroit; activated a Helpline furnishing non-emergency expert advice to state and local first responders; activated an emergency Hotline supported by FBI, FEMA, CBDCOM, and the National Response Center; and initiated the shipment of training equipment sets to eight metropolitan areas in order to sustain the training of local officials. During the remainder of FY 1998, the training and delivery of training equipment to cities, as well as testing of personal protection equipment, will continue.

- *Joint Chemical/Biological-Rapid Response Team (C/B-RRT).* In support of the Domestic Preparedness program, DoD has delegated the responsibility of developing a rapid response team to CBDCOM. In 1997, CBDCOM submitted a concept of operations for the C/B-RRT to the U.S. Army Director of Military Support. The concept is currently being reviewed within OSD, the Department of the Army, and the JCS. A command and communications, logistics, and personnel package is being developed for the team's headquarters element. The Domestic Preparedness program is developing pre-positioned equipment packages to aid in resourcing federal response organizations, including the C/B-RRT, during CW/BW incidents. Elements of the C/B-RRT participated in the final demonstration of the Consequence Management "911-Bio" ACTD (see Section 8.3.2).

In FY 1999, DoD plans to continue these domestic preparedness and response initiatives focusing on: i) providing emergency response preparedness through First Responder training and assistance to metropolitan area authorities; ii) improving DoD's rapid CW/BW response capabilities; and iii) conducting preparedness exercises in coordination with federal, state, and local agencies.

8.2.2 Other Interagency Initiatives to Counter Paramilitary and Terrorist NBC Threats. The following interagency activities are important in addressing the global threat of NBC terrorism.

The CPRC's Role in Countering Paramilitary and Terrorist NBC Threats. The CPRC is coordinating DoD, DOE, and U.S. Intelligence activities and programs developing technologies and systems that can be used by federal, state, and local emergency response teams to counter terrorist activities involving NBC weapons. It also coordinates these activities with other interagency organizations, including the TSWG. The CPRC brings senior level attention to the activities and programs of DoD, DOE, and U.S. Intelligence to help ensure the effective application of resources and expertise in countering these threats. In recognition of the CPRC's responsibilities for countering NBC paramilitary and terrorist threats, ASD(SO/LIC) is a charter member of the CPRC Standing Committee.

The Technical Support Working Group. The TSWG develops and integrates R&D requirements for combating terrorism across the interagency spectrum. The TSWG is primarily concerned with rapid prototype development of equipment to address critical multi-agency and future threat counter- and anti-terrorism requirements. The TSWG has eight functionally aligned subgroups, which are chaired by representatives from several agencies. The subgroups are: Tactical Operations; Explosive Detection and Disposal; WMD Countermeasures; Personnel Protection; Surveillance, Collection, and Operations Support; Physical Security; Infrastructure Protection; and Investigative Support and Forensics. WMD countermeasures – developing techniques to detect, neutralize, and mitigate CW/BW agents – remains a high priority. A significant portion of the TSWG's technology development efforts are directly related to countering NBC weapons. The TSWG identifies requirements and develops technologies for a variety of users including: DoD, DOE, U.S. Intelligence, FEMA, Public Health Service, Secret Service, U.S. Marshals Service, Federal Aviation Administration, U.S. Customs Service, and the Centers for Disease Control and Prevention. The TSWG also provides prototype equipment to C/B-RRT units for domestic and overseas response to CW/BW incidents. DoD, under the direction of ASD(SO/LIC), develops technology to meet these interagency requirements through the Counterterror Technical Support program. (See also Section 4.6.)

8.3 DoD Activities and Programs to Counter Paramilitary and Terrorist NBC Threats

In coordination with the FBI and other U.S. government counterterrorism components, DoD is continuing to pursue several activities to counter paramilitary and terrorist NBC threats. These efforts include supporting, training, and equipping DoD teams to detect, neutralize, and render safe NBC weapons and devices in permissive and nonpermissive environments both in the U.S. and overseas. These DoD teams include select units from the Army, Navy, and SOF units. DoD is also actively supporting the development of robust consequence management capabilities, like those embodied in the Marines' CBIRF, to respond to incidents involving NBC weapons, including the release of NBC agents. These activities and programs are discussed in the remainder of this section.

The Defense Against Weapons of Mass Destruction Act of 1996 (Sec. 1414 of the FY 1997 NDAA) also directed the Secretary of Defense to "develop and maintain at least one domestic terrorism rapid response team composed of members of the Armed Forces and employees of the DoD who are capable of aiding Federal, State, and local officials in the detection, neutralization, containment, dismantlement, and disposal of weapons of mass destruction containing chemical, biological, or related materials." In addition, PDD-39, dated

June 1995, is the principal interagency guidance for counterterrorism activities. The two DoD mission documents continuing to guide the Department's counterterrorism response efforts are the CJCS's *Counterproliferation CONPLAN 0400* and the *Counterterrorism CONPLAN 0300*. These documents, developed by each CINC for their Area of Responsibility, delineate user requirements and ensure "requirements/demand pull" of technology development activities. The CINCs are developing, in the current fiscal year, individual consequence management plans as part their area-specific concept plans as required by the *Counterproliferation CONPLAN 0400*.

DoD is budgeting approximately $200 million for FY 1999 in technology R&D and acquisition activities in response to ACE priorities directly involving countering NBC paramilitary and terrorist threats (i.e., DoD ACE priorities 5 and 6). This is an increase of over 15% compared to FY 1998 funding.

National Defense Panel Study. A follow-on study to the QDR, *Transforming Defense: National Security in the 21st Century*, was conducted by the National Defense Panel and released in December 1997. This panel was charged with analyzing potential threat scenarios out to the year 2020 and providing recommendations. Responding to the need of domestic preparedness, the panel recommended: i) developing integrated active and passive defense measures against the use of NBC/M; ii) developing and retaining the option to deploy a missile defense system capable of defeating limited attacks; iii) incorporating all levels of government into managing the consequences of an NBC/M-type attack; iv) preparing reserve components to support consequence management activities; and v) using DoD assets to advise and assist law enforcement in combating terrorist activities.

Defense Science Board Summer Study on Transnational Threats. In December 1997, the Defense Science Board (DSB) Summer Study Task Force submitted to the Secretary of Defense its final report on *DoD Responses to Transnational Threats*. The Task Force observed that with post-Cold War geopolitical changes, the U.S. increasingly faces transnational threats from international terrorists, narcotics traffickers, NBC weapons proliferation, and organized crime. The Task Force recognized that transnational adversaries represent a different and difficult challenge to the DoD because of a willingness to employ NBC weapons; because of the difficulty deterring the threats/threat groups; and because transnational adversaries respect no boundaries, whether political, organizational, legal, or moral. Nevertheless, the Task Force noted that DoD possesses considerable assets to contribute to, and leverage against, the overall U.S. effort to combat these threats. Notably, the DSB recognized that, given the commonalities existing between DoD force protection requirements and civilian protection/domestic preparedness, the U.S. should leverage DoD capabilities and expertise in these areas. The Task Force also asserted that establishing a global information infrastructure and facing head-on the "Too Hard" problems, such as NBC proliferation, would be critical to addressing transnational threats. In response, ASD(SO/LIC) led an OSD/Joint Staff team to assess the recommendations from the Task Force. In their review, they documented the numerous actions under way from OATSD(NCB), OASD(SO/LIC), OASD(C3I), the Services, and other agencies to improve U.S. capabilities to counter these threats. The Secretary of Defense approved this course of action on March 12, 1998.

8.3.1 New DoD Initiatives. In addition to interagency initiatives, several new DoD initiatives in the area of countering paramilitary and terrorist NBC threats are described below.

Air Force Antiterrorism Specialty Team and Force Protection Battlelab. In the Spring of 1997, the Air Force Office of Special Investigations (OSI) activated its Antiterrorism Specialty Team, whose mission is to meet the force protection needs of Air Force commanders worldwide. Team members are highly trained in surveillance, counterintelligence, and personnel and facility vulnerability assessments, and will work closely with local, national, and host country security agencies to gather and disseminate threat information. In conjunction with this unit, the Air Force established a Force Protection Battlelab, to explore and integrate technology, tactics, and training to increase all aspects of force protection readiness, from blast protection to detection of CW/BW agents. Additional project details are provided in Table 8.1 and in Appendix C (Table C.5).

National Guard/Reserve Component Rapid Assessment and Initial Detection (RAID) Teams. In early 1998, DoD allocated $49.2 million to activate ten Army National Guard RAID Teams in selected U.S. cities to respond to NBC incidents. Under this initiative DoD will also establish National Guard and Reserve NBC surveillance and patient decontamination elements and a Reserve Component program office to oversee NBC consequence management response activities. Additional project details are provided in Table 8.1 and in Appendix C (Table C.9).

DoD Combating Terrorism Program Standards and Vulnerability Assessments. In July 1997, ASD(SO/LIC) signed a new DoD instruction establishing program standards for combating terrorism. Key provisions include the development of CINC, Service, and Agency standards, requirements for antiterrorism awareness training, and the development of specific plans for collecting and analyzing threat information and assessing vulnerabilities. In support of these initiatives, the Joint Staff, in cooperation with DSWA, formed five Joint Staff Integrated Vulnerability Assessment (JSIVA) teams. The teams are contracted to conduct assessments at approximately 100 installations each calendar year and will evaluate preparedness against, vulnerabilities to, and ability to respond to terrorist attacks. Each geographic CINC and Service is given an appropriate share of the 100 assessments. The CINCs and Services then nominate installations for JSIVA teams to assess. The current potential pool of installations from which the CINCs and Services can draw is in excess of 600. (For more details on this project, see Section 8.3.3, DoD's Force Protection Initiative.)

CJCS Combating Terrorism Readiness Initiatives Fund. In FY 1997, this fund was made available for emergency or other unforeseen, high priority requirements associated with combating terrorists. The fund provides a means for the CINCs to react to unanticipated needs resulting from changes in the terrorist threat level, the political situation, or force protection doctrine/standards. The CJCS disbursed $24 million to the Combatant Commands in FY 1997 to help purchase antiterrorism equipment, and, currently, $15 million is available for FY 1998 requests. Additional project details are provided in Table 8.1 and in Appendix C (Table C.12).

8.3.2 Counterproliferation Support Program Projects to Counter Paramilitary and Terrorist NBC Threats. The Counterproliferation Support Program is coordinating its technology prototype development activities in this functional area with the TSWG, through ASD(SO/LIC) and its CTTS program, and the U.S. Special Operations Command (USSOCOM) to ensure relevance and responsiveness in meeting user needs. The DOE National Laboratories are also contributing to these projects. Project details are discussed below, in Table 8.1, and in Appendix C (Table C.1).

In support of the *Counterterrorism CONPLAN 0300* and the *Counterproliferation CONPLAN 0400*, ATSD(NCB) on behalf of the Counterproliferation Support Program, operates under a Memorandum of Agreement with USSOCOM and a Terms of Reference with ASD(SO/LIC). These agreements are facilitating closer cooperation among the organizations and streamlining the process of responding to the requirements of CINC SOCOM, DoD, and interagency organizations for countering NBC paramilitary and terrorist threats. These agreements focus on leveraging CW/BW defense technologies to accelerate their fielding and adapt them to the special operations environment. Accelerating technology development helps address the critical technology shortfalls of Service and SOF units tasked with NBC-related missions. This initiative will also facilitate the transfer of DoD-developed technologies to other interagency response groups within DOE, U.S. Intelligence, the FBI, Secret Service, U.S. Customs Service, and the Department of State.

The Counterproliferation Support Program continues to work closely with the TSWG and CTTS program to improve capabilities unique to the interagency emergency response needs of first responders. Projects planned for FY 1999 include: i) evaluation and fielding a Chemical/Biological Sentry System (CBSS) for detection and warning of CW/BW agents; ii) delivery of the SOF Chemical Agent Detector to users and increasing the number of agents it can detect; and iii) fielding a chemical simulant detection kit for training First Responders. Key accomplishments for the First Responder projects since last year's report include: i) completed fabrication of four prototype CBSS; ii) completed testing and evaluation of the Escape Hood; and iii) field tested the Biological Detection Kit during the Consequence Management "911-Bio" ACTD.

The Counterproliferation Support Program also is funding a wide range of specialized technologies adapted to the special operations environment to detect, disable, render safe, and, if necessary, recover critical components from NBC devices in nonpermissive and time sensitive environments. Specific details regarding technology developments in this area cannot be discussed in this unclassified setting.

The Consequence Management "911-Bio" ACTD. The Consequence Management (911-Bio) ACTD was sponsored by the Office of the DATSD(NCB)(CP/CBD) and the Deputy Under Secretary of Defense for Advanced Technology (DUSD(AT)). The ACTD involved the Marine Corps CBIRF and the Army's Technical Escort Unit (TEU) and was intended to exercise key NBC weapons consequence management technologies in a field environment. The ACTD was evaluated by teams from Dugway Proving Ground, Argonne National Laboratory, and Air Force Operational Test and Evaluation Center. The 911-Bio ACTD considered BW incidents in a domestic counterterrorism scenario and was conducted at Dugway Proving Ground, Utah. The 911-Bio ACTD was conducted in two phases: a Preliminary Demonstration (completed in June 1997) and a Final Demonstration (completed in December 1997). The main objective of the Preliminary Demonstration was to perform a "dry run" of the ACTD, so that critical problems or issues could be identified. Once key problems and issues were identified, the Final Demonstration was then structured to eliminate them. Results from the Final Demonstration are only now emerging, but it is evident that the ACTD was a major success. After the demonstration results are assessed, decisions will be made to field technologies, fund additional development for future fielding, or to discontinue R&D funding. Some of those successes of the ACTD are highlighted in the following paragraphs.

ACTD Purpose and Achievements. The purpose of the 911-Bio ACTD was to enhance worldwide military capabilities to respond effectively to the use of BW by demonstrating and validating: i) key NBC consequence management technologies in a field environment and R&D and acquisition priorities; ii) operational concepts of the CBIRF and the U.S. Army TEU; and iii) the ability of DoD units to integrate with federal, state, and local agencies in a scenario involving domestic counterterrorism. There were many notable achievements in each of these three areas. To begin with, the ACTD was successful in demonstrating 15 BW agent collection, concentration, detection, and identification technologies in a field environment. Although final evaluation of these technologies has not been completed, initial results revealed that some of the technologies have met or exceeded expectations. The ACTD also developed and/or improved facilities at Dugway Proving Ground that were necessary for instrumented consequence management training and testing. These facilities will be available for future exercises and demonstrations. Finally, several existing numerical models were adapted and evaluated for use as indoor hazard prediction tools. Prior to this ACTD, the identification and assessment of models for this purpose had not been conducted, and, although this study was far from comprehensive, it is now possible to make judgements as to the applicability of each model.

In the area of operational concepts, the ACTD marked the first time that the TEU and CBIRF units trained together for BW scenarios. As a result of this ACTD, the TEU and CBIRF published a jointly approved concept of operations, a significant "leave-behind" for the ACTD. Additionally, the ACTD represented the first opportunity for the DoD C/B-RRT to exercise in a BW scenario. Finally, the ACTD demonstrations were successful in facilitating a refinement of biological sampling and sample handling techniques (chain of custody) for both the TEU and CBIRF.

In the third area of DoD unit integration with federal, state, and local agencies, the ACTD successfully brought together for the first time non-DoD federal agencies, state emergency management personnel, and local first responders in a DoD ACTD. Representatives from the FBI, FEMA, the State of Utah, Salt Lake City, Salt Lake County, and Tooele County participated in the two day demonstration in December. These players also benefited from a one day biological consequence management training session prior to the final demonstration from a multi-disciplinary team from OSD, DOE, Navy, Army, TEU, CBIRF, and Dugway Proving Ground.

Two other major achievements that should be highlighted include: i) this ACTD was managed through an innovative structure, relying on IPTs, video teleconferencing, and extensive support-contractor assistance, which resulted in the successful planning and completion of two demonstrations in less than one year; and ii) integrated, dedicated chamber tests and a "vignette day" were used to establish definitive baseline technical performance levels for the sampling, detection, and identification technologies, while also providing realistic operator training opportunities for TEU and CBIRF. During the chamber tests, unit representatives received training and familiarization on the technologies, as well as the opportunity to develop working relationships with the materiel developers who were present during the trials. With these successes in mind, it is evident that the 911-Bio ACTD has facilitated the beginning of a more robust response capability for DoD support to other U.S. government agencies in a domestic bio-terrorism scenario, as well as provided a viable management model for future, similar ACTDs. Additional project details are provided in Table 8.1 and in Appendix C (Table C.1).

8.3.3 Other DoD Programs to Counter Paramilitary and Terrorist NBC Threats. DoD Agency and Joint Service programs are also addressing counterproliferation ACEs in countering paramilitary, covert delivery, and terrorist NBC threats. These are described below.

The Chemical/Biological Incident Response Force (CBIRF). The CBIRF was officially established by the Marine Corps in February 1997 to deal with the consequences of incidents involving the release of CW/BW agents. The CBIRF consists of approximately 375 Marines and Sailors and has recently established a 120 man Rapid Response Force on 4 hour alert that can be reinforced within 24 hours. The Rapid Reaction Force has placed heavy emphasis on decontamination, casualty clearing, and service support, but also includes headquarters, reconnaissance, and medical stabilization elements.

DoD's Force Protection Initiative. DSWA, acting as the technical agent for the Combating Terrorism Directorate (J-34) of the JCS Operations Directorate (J-3), has staffed and trained an organization to conduct comprehensive integrated vulnerability assessments at DoD installations worldwide. Five teams, nominally comprising seven individuals, conduct on-site assessments and make recommendations to installation commanders on ways to enhance the installation's force protection posture. A review of results after the first year of operation indicates that most recommendations made by the teams are procedural, requiring an adjustment in operating practices of installation personnel. A small number of recommendations require folding the implementation of recommendations into long-term modification and construction plans because the cost of mitigation exceeds the ability of the installation to address the problem using available funds, or it requires commitment of MILCON funds. The products delivered by the DSWA teams to the installation include an outbrief at the end of the week-long assessment and a report that details the observations and recommendations of the Joint Staff Integrated Vulnerability Assessment team. The reports are also analyzed for trends, which serve as one input into the R&D community for leveraging their investments to address the most pressing and common force protection problems. Additional project details are provided in Table 8.1 and in Appendix C (Table C.8).

Chemical and Biological Defense Program Anti-Terrorism Support. The CBD Program is supporting anti-terrorism activities by assisting in the vulnerability assessments of DoD installations to CW/BW terrorism threats. The knowledge gained from these assessments is used in training U.S. forces to respond to CW/BW threats both in the U.S. and overseas. In addition to developing training programs, efforts are focusing on developing a suitable process and establishing an assessment team to conduct vulnerability assessments. Plans for FY 1999 include updating standards and reviewing installation NBC weapon vulnerability implementation plans and conducting instructional vulnerability exercises. Additional project details are provided in Table 8.1 and in Appendix C (Table C.2).

OSD Counterterror Technical Support Program. The CTTS Program is managed by ASD(SO/LIC) and addresses the joint interagency requirements developed by the TSWG. The CTTS program develops technology and prototype equipment with direct operational application to the national effort to combat terrorism. Projects include technology development to support operations involving: hostage rescue; personnel protection; unconventional and NBC weapons and devices; attacks on installations, infrastructure, and the general populace; and explosives detection and disposal. The CTTS program responds to multi-agency requirements and priorities, and many

of its constituent projects are co-funded in cooperation with non-DoD emergency response organizations. Current priorities are the detection and neutralization of terrorist built explosive devices and developing countermeasures against CW/BW terrorism. Development of diverse products is continuing under the Explosives Detection and Disposal and Weapons of Mass Destruction Countermeasures segments of the CTTS program, including: i) detectors employing advanced technology Raman light spectroscopy to detect, characterize, and identify residues of improvised explosive devices; ii) a jointly developed chemical detection system for SOF; and iii) an inspection system for non-intrusive package inspection. Key accomplishments since last year's report include: i) deployed several Large Vehicle Bomb Countermeasures devices to CENTCOM; ii) completed fabrication of four prototype CBSS; iii) delivered SOF Chemical Agent Detector (CAD) prototypes; iv) completed testing and evaluation of an escape hood; and v) field tested the Biological Detection Kit during the 911-Bio ACTD. Additional project details are provided in Table 8.1 and in Appendix C (Table C.9).

SO/LIC Analytical Support. This project provides specialized research and analytical support for ASD(SO/LIC). Projects address a broad spectrum of technical, acquisition, and policy issues relating to special operations, counter- and anti-terrorism, peacekeeping, psychological operations, counterinsurgency, unconventional warfare, and contingency operations. During FY 1997, this project completed activities such as the counterproliferation capabilities table top exercise and other studies on psychological operations, future operations, and special operations force structure requirements. Additional project details are provided in Table 8.1 and in Appendix C (Table C.9).

OSD Explosive Ordnance Disposal/Low-Intensity Conflict Program. This program is a rapid prototyping effort providing advanced technology and equipment to Explosive Ordnance Disposal (EOD) and SOF operators who are confronted with explosive threats. The technology is focused on the detection, clearance, and safe disposal of all types of explosive threats including NBC munitions and improvised terrorist weapons. Requirements submitted by the Joint Service EOD and SOF communities are prioritized by OSD's EOD/LIC Coordination Group. In FY 1999, an enhanced real-time radiography system will be fielded. Focus will continue on developing advanced access, diagnostics, and disablement prototypes equipment and techniques to counter NBC devices. Additional project details are provided in Table 8.1 and Appendix C (Table C.9).

Navy Joint Service EOD Systems and Procedures Programs. These EOD R&D programs are sponsored by the Navy as the single manager for EOD technology and training. These programs field safe and effective EOD systems and procedures to counter unexploded ordnance (UXO) of all types. Improvised explosive devices, historically used in terrorist activities, and special improvised explosive devices (SIEDs), incorporating explosives and/or NBC agents, are both subsets of the full spectrum of threat ordnance that EOD forces must be prepared to counter. The Joint Service EOD Systems Program develops operational EOD systems to detect, identify, render safe, and dispose of all types of UXO, including NBC munitions. Key accomplishments since last year's report include: i) continued development of UXO neutralization tools; including EMD approval for the Main Charge Disrupter and developmental testing of a Lightweight Disposable Disrupter in preparation for EMD in FY 1998; ii) EMD approval of the Remote Ordnance Neutralization System and EMD contract award; and iii) continued development of Advanced Radiographic System in preparation for production or fielding/deployment approval in FY 1998.

The Joint Service EOD Procedures Program complements the Navy's Joint Service EOD Systems Program by developing and fielding validated procedures and techniques for EOD personnel against threat ordnance. Included in this effort are techniques for application of EOD systems against threat ordnance and evaluation of prototype equipment for use by the Defense Technical Response Group (DTRG) in countering SIED incidents. This program develops specialized procedures required for detecting, localizing, and rendering safe unexploded ordnance, including conventional and SIED threat ordnance. Included in fielded EOD procedures are over 2,800 EOD bulletins covering the full spectrum of threat ordnance. Key accomplishments since last year's report include: i) validation and fielding of 250 procedures; and ii) refining DTRG roles and responsibilities in support of SIED mission. Additional project details are provided in Table 8.1 and in Appendix C (Table C.4).

OSD Joint Physical Security Equipment Program. This program consolidates related DoD Joint Service and Agency RDT&E programs developing advanced technologies for protecting critical, high value military assets from paramilitary, terrorist, intelligence, and other hostile threats. Efforts focus on protecting personnel, facilities, and high value weapons systems, including nuclear and chemical weapons systems and storage facilities. This program is serving as the focal point for near-term upgrades to U.S. facilities under the Force Protection Initiative discussed above. Key accomplishments since last year's report include: i) demonstrating commercial-off-the shelf Force Protection equipment to government users; ii) completing a contractor test and evaluation for the Saber 203 (Delay/Denial) system; iii) successfully completing the second technical feasibility test of the Mobile Detection Assessment Response System-Interior; iv) completing Phases I and II of a Waterside Security System Advanced Technology Demonstration at Submarine Base Kings Bay, Georgia; and v) completing "Smart Ship" equipment testing and modification for installation of Shipboard Physical Security packages. Additional project details are provided in Table 8.1 and in Appendix C (Table C.9).

OSD Joint Robotics Program. This program was established in response to congressional guidance to consolidate Service and DoD Agency robotics programs on unmanned ground vehicle systems and is executed under the oversight of the Director for Strategic and Tactical Systems (under the PDUSD(A&T)(S&TS)). The objective of the program is to demonstrate and validate mature robotics technologies that are adaptable to multi-Service applications, provide an unmanned operational capability in hazardous and contaminated environments, provide improved battlefield efficiency by permitting supervised autonomous operations, and serve to reduce force manpower and support requirements. Telerobotic technologies are under development that enable the performance of missions in hazardous chemical and radiation environments and in situations where there is an explosive hazard or when NBC weapons might be present. Those projects having direct application to countering NBC paramilitary and terrorist threats include: i) the Remote Ordnance Neutralization System, designed to complement or augment EOD operations; ii) the Tactical Unmanned Vehicle (TUV), an organic, unmanned vehicle designed to provide U.S. forces with general reconnaissance, surveillance, and target acquisition support, including chemical vapor and other hazards detection; and iii) the Robotic Excavation Vehicle System and the Basic Unexploded Ordnance Gathering System to detect, recover, and dispose of unexploded ordnance. Key accomplishments in these areas include: i) completing four TUV field training exercises at Army/Marine Corps bases; and ii) delivering four Surveillance and Reconnaissance Ground Equipment systems to Army/Marine Corps units for user appraisal. Additional project details are provided in Table 8.1 and in Appendix C (Table C.9).

Table 8.1: Key DoD Programs to Counter Paramilitary and Terrorist NBC Threats

Program/Project Title	Project Description	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
New Initiatives					
• Air Force Antiterrorism Specialty Team	• Specialized team to support force protection needs of Air Force commanders worldwide	5	USAF OSI	.312	208047F
• Air Force Force Protection Battlelab	• Explore and integrate technology, tactics, and training to increase force protection readiness	5	USAF	4.702	208047F
• National Guard/Reserve Component RAID Teams	• Provide augmentation forces to civil authorities through expanded National Guard and Reserve Component assets to respond to NBC events	6	Army	49.2	Procurement O&M
• DoD's Force Protection Initiative	• Conduct force protection assessments, field assessment teams to identify and evaluate shortfalls, and develop an R&D support plan	5	DSWA	4.400	O&M
• CJCS Combating Terrorism Readiness Initiatives Fund	• Funds available to CINCs for emergency or other unforeseen, high-priority combating terrorism needs	5	JCS J-34	15.000	208047J
CP Support Program					
• First Responder Support	• Development of capabilities and technologies to enhance interagency response to CW/BW threats	6, 5	SOCOM	1.381	603160BR
• Specialized SOF Technologies and Prototype Devices	• Specialized SOF technologies to detect, disable, render safe, and, if necessary, recover critical components from NBC devices in nonpermissive and time sensitive environments	5	SOCOM	14.282	603160BR
Strongly Related CP Programs					
• Domestic Preparedness Initiative	• Improve NBC emergency response preparedness and coordination with state and local agencies through First Responder training, interagency exercises, and technical assistance	6	ASD (SO/LIC) Army	49.900	O&M
• Marine Corps CBIRF	• Unit dedicated to managing the consequences of incidents involving CW/BW release	6	USMC	9.000 10.000 1.277	O&M Procurement 605873M
• CBD Program Anti-Terrorism Support	• Vulnerability assessments of DoD installations to CW/BW threats and training for threat response	5	Joint Service	2.952	605384BP
• Counterterror Technical Support Program	• Develop technical capabilities and prototype systems to detect, render safe, and defend against paramilitary and terrorist NBC threats	5	ASD (SO/LIC)	30.495	603122D
• SO/LIC Analytical Support	• Research/analysis of technical, acquisition, and policy issues relating to special operations, counterterrorism, and unconventional warfare	5	ASD (SO/LIC)	1.335	603122D
• Explosive Ordnance Disposal/ Low Intensity Conflict Program	• Rapid prototyping effort to provide technology and equipment for the detection and neutralization of explosive devices	5	ASD (SO/LIC)	3.983	603122D
• Navy Joint Service EOD Systems Program	• Specialized equipment to locate, access, and render safe unexploded ordnance to include improvised explosive devices containing NBC materials	5	Navy	5.505	603654N
• Navy Joint Service EOD Procedures Program	• Develops tests and validates EOD procedures using specialized EOD techniques and systems to counter unexploded ordnance	5	Navy	5.251	604654N
• Joint Physical Security Equipment	• Consolidates DoD activities for facility and nuclear and other high value weapons protection equipment	5	PDUSD (S&TS)	31.792	603228D
• Joint Robotics Program	• Consolidates Service/DoD efforts to demonstrate mature robotics technologies for EOD	5	PDUSD (S&TS)	5.385	603709D

8.4 DOE Activities and Programs for Nuclear Emergency and Terrorism Response

DOE maintains several emergency response assets postured to respond to terrorist or other incidents involving nuclear weapons or devices. DOE conducts analyses and provides operational and technical support in response to nuclear emergency and terrorism events worldwide. DOE's threat assessment process consists of an evaluation of nuclear threats from technical, operational, and behavioral standpoints. The assessment is integrated into the decision process for deployment of operational assets. The emergency response asset with primary responsibility for responding to acts of nuclear terrorism is the NEST. NEST provides operational and technical support for resolution of incidents or accidents involving nuclear materials and can be deployed anywhere in the world under the authority of the lead federal agency (i.e., the FBI for operations within the U.S. and the Department of State for overseas operations). This national resource of skilled personnel and specialized equipment is built on DOE's nuclear weapons design and production expertise. These resources are the most effective national assets to locate, identify, assess, and disable nuclear weapons and devices. Such devices include, for example, improvised nuclear devices with the potential to produce a nuclear yield as well as radiological dispersal devices that could be used to spread radioactive contamination.

DOE's integrated program to prevent or detect nuclear smuggling also plays a significant role in countering possible terrorist activities involving nuclear weapons or devices. DOE works closely with others in the interagency counterterrorism community, providing technology support for the detection and interdiction of illicit nuclear material. Efforts to secure nuclear material at its source and detect illicit nuclear material in transit will help to reduce the number of potential terrorist incidents.

DOE's CW/BW agent detection R&D program (described in Section 6.2.4) will provide direct support to future capabilities for countering and responding to CW/BW terrorist incidents. The four thrust areas of fundamental biology, prediction, detection, and mitigation are focused on improving capabilities to detect and identify CW/BW agents; understanding and predicting the flow, dispersal, and concentration of CW/BW agents; and providing cost-effective, environmentally benign decontamination technologies suitable for use in urban environments.

8.5 U.S. Intelligence Activities and Programs Related to Countering NBC Terrorism

Interagency Intelligence Committee on Terrorism (IICT). The current mission and functions of the IICT were established by a 1990 DCI directive and reaffirmed by a 1995 PDD. The IICT has the mission of advising and assisting the DCI in the discharge of his duties and responsibilities with respect to the coordination of national intelligence on terrorism issues and promoting the effective use of intelligence community resources for this purpose. Currently there are 45 U.S. government agencies or organizations from the intelligence, law enforcement, regulatory, and defense communities that have representation on the IICT and its subcommittees. The IICT has seven subcommittees, including the Chemical, Biological, and Radiological Subcommittee. The IICT carries out the following primary functions: promote the exchange of intelligence; manage the Community Terrorist Threat Warning System; hold monthly Warning and Forecast meetings; coordinate the preparation of Community Threat Assessments; facilitate the exchange of technical and forensic information; coordinate and establish intelligence

requirements; promote and coordinate R&D efforts; hold exchanges with other governments; and promote training and instruction.

The reader is referred to the Intelligence Annex for additional information on U.S. Intelligence activities and programs related to countering NBC terrorism.

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9. CPRC Findings and Recommendations

9.1 The Integrated Response to Countering Proliferation and NBC Terrorism

Table 9.1 summarizes the integrated response of DoD and DOE in addressing the counterproliferation ACEs. Key organizations are matched to the ACE priorities they address. For simplicity, the ACEs are listed by DoD priority. The response of U.S. Intelligence is discussed in the Intelligence Annex. Considerable R&D, acquisition, and operational activities are under way in each ACE priority area by multiple DoD Agencies (including through the Chemical and Biological Defense Program (CBDP) and the Counterproliferation Support Program (CPSP)), OSD, the Services, Joint Staff, and DOE.

Table 9.1: Integrated Response to Addressing the Counterproliferation ACEs

Counterproliferation ACE	Key DoD and DOE Programs To Counter Proliferation*
• Detection, Identification, and Characterization of BW Agents	• DoD: CBDP, CPSP, DARPA, and Joint Service Programs • DOE: Chemical Biological Nonproliferation Program (CBNP)
• Detection, Characterization, and Defeat of NBC/M Facilities with Minimal Collateral Effects	• DoD: DSWA, CPSP, and Air Force Programs • DOE: Production Detection R&D Program
• Detection, Characterization, and Defeat of Underground Facilities with Minimal Collateral Effects	• DoD: DSWA, CPSP, and Joint Service Programs • DOE: Production Detection R&D Program
• Ballistic Missile Active Defense	• DoD: BMDO, Service, and Joint Staff Programs
• Support for Special Operations Forces and Defense Against Paramilitary, Covert Delivery, and Terrorist NBC Threats	• DoD: OSD, Joint Service, DSWA, and CPSP Programs • DOE: Nuclear Emergency/Terrorism Response and CBNP Programs
• Provide Consequence Management	• DoD: OSD, Joint Service, National Guard/Reserve Components, DARPA, and CPSP Programs • DOE: Nuclear Emergency/Terrorism Response and CBNP Programs
• Cruise Missile Defense	• DoD: Service, BMDO, and Joint Staff Programs
• Collection, Analysis, and Dissemination of Actionable Intelligence to Counter Proliferation	• DoD: DARPA, Joint Service, DSWA, and CPSP Programs • DOE: Intelligence Programs
• Robust Passive Defense to Enable Sustained Operations on the NBC Battlefield	• DoD: CBD, Joint Service, DSWA, DARPA, and CPSP Progs. • DOE: CBNP Program
• BW Vaccine RDT&E and Production to Ensure Stockpile Availability	• DoD: CBD and Joint Vaccine Acquisition Programs
• Target Planning for NBC/M Targets	• DoD: DSWA, DARPA, Joint Service, and CPSP Programs
• Prompt Mobile Target Detection and Defeat	• DoD: DARPA, Air Force, and CPSP Programs
• Detection, Tracking, and Protection of NBC/M and NBC/M-Related Materials and Components	• DoD: Navy, OSD, CTR, OSIA, DSWA, and CPSP Programs • DOE: Diversion/Smuggling Detection R&D and MPC&A Programs
• Support Export Control Activities of the U.S. Government	• DoD: OSD, DTSA, OSIA, and CPSP Programs • DOE: Nuclear Export Controls Program
• Support Inspection and Monitoring Activities of Arms Control Agreements and Regimes	• DoD: OSIA, CTR, DSWA, OSD, and Air Force Programs • DOE: Nuclear Test Monitoring and NPT Regime Programs

* U.S. Intelligence programs are discussed in the Intelligence Annex

9.2 Integrated Capability Shortfalls and Areas for Progress

Table 9.2 summarizes key CPRC-identified capability shortfalls and candidate areas for progress to address these shortfalls for each of the counterproliferation ACEs. While no claim of completeness should be inferred from these lists, they are indicative of the CPRC's concerns in meeting its responsibility to ensure the development and deployment of highly effective technologies and capabilities in support of U.S. counterproliferation and counterterrorism policy.

9.3 Findings and Recommendations

The CPRC finds, as evidenced by the numerous program and activity accomplishments cited in the report, that the seriousness of NBC/M proliferation and NBC terrorist threats, and the need to enhance capabilities to counter them, are recognized throughout DoD (including OSD, the Joint Staff, Services, and CINCs), DOE, and U.S. Intelligence. Indeed, "countering proliferation" is an established and institutionalized priority within each of the CPRC-represented organizations. The development of capabilities to counter NBC terrorist threats is beginning to receive added attention throughout DoD, DOE, and U.S. Intelligence. These efforts reflect the President's firm commitment to stem NBC/M proliferation and negate terrorist NBC threats. Much has been done, but much remains to do. Moreover, as decision makers, policy makers, and warfighters continue to reprioritize their nonproliferation, counterproliferation, and NBC counterterrorism policy and strategy objectives, the CPRC will continue to review related DoD, DOE, and U.S. Intelligence activities and programs to ensure that they continue to meet evolving needs and requirements. The CPRC's recommendations for 1998 are summarized in Figure 9.1 and discussed below.

The FY 1999 President's budget addresses priority activities and programs for countering NBC/M proliferation and NBC terrorism. *Therefore, the CPRC recommends that the FY 1999 President's Budget for each of the CPRC-represented organizations be authorized and appropriated by the Congress.*

Countering proliferation and NBC terrorism are challenges that will have to be addressed for the foreseeable future. Although the activities and programs proposed in the FY 1999 President's Budget will continue to produce substantial progress in national capabilities to counter NBC/M proliferation and NBC terrorist threats, areas of capability shortfall will remain. *Therefore, the CPRC directs each represented organization to continue to address nonproliferation, counterproliferation, and NBC counterterrorism needs and requirements as high priority items in their FY 2000 and out-year budgets.* In light of the CPRC's finding that the need to enhance U.S. national capabilities to counter proliferation is established and institutionalized within the DoD, DOE, and U.S. Intelligence, the CPRC has not identified specific programmatic options for FY 2000. The CPRC expects the normal budget development processes of each CPRC-represented organization to be adequate to ensure a robust, integrated program for countering proliferation and NBC terrorism and satisfy congressional direction to formulate future programmatic options. However, key areas for progress addressing certain specific aspects of the ACE priorities have been identified for special consideration during budget development activities (see Table 9.2).

Table 9.2: CPRC-Identified Capability Shortfalls and Areas for Progress

ACE Priorities	Capability Shortfalls	Areas for Progress
1. Detection, Identification, and Characterization of BW Agents	• Rapid early warning and identification of multiple agents, including standoff detection capability • Identification of "designer" agents	• Remote/early warning identification and improved detector sensitivity/selectivity • Agent nonspecific detectors
2. Detection, Characterization, and Defeat of NBC/M Facilities with Minimal Collateral Effects	• Adverse weather precision standoff attack • Counterforce effectiveness and multiple attack options (structural and functional defeat) with minimal collateral effects	• All-weather precision standoff weapons and enhanced lethality payloads • Improved detection/characterization, functional kill, agent defeat, BDA, and collateral effects detection
3. Detection, Characterization, and Defeat of Underground Facilities with Minimal Collateral Effects	• Counterforce effectiveness against deeply buried and tunneled targets • Location and characterization of underground targets • Identification of functional and organizational vulnerabilities	• Improved penetrating munitions • Remote sensors for target and geology characterization and BDA • Improved target functional analysis
4. Ballistic Missile Active Defense	• Theater saturation • Probability of threat missile intercept and leakage • NBC warhead sure kill and collateral effects mitigation • Midcourse tracking of warheads by passive/IR sensors below the radar horizon	• Reduction of saturation and leakage, including via attack operations • Enhanced interceptor warhead lethality • Agent defeat warheads and mechanisms • Long wave IR sensors and cryocoolers
5. Support for Special Operations Forces and Defense Against Paramilitary, Covert Delivery, and Terrorist NBC Threats	• Detection and safeing of NBC weapons and devices • Neutralization of NBC/M infrastructure elements with minimal collateral effects • Risk to SOF personnel • Extended range operations	• CW/BW agent defeat devices • Specialized assault/breach equipment • SOF standoff/remote capability • Improved NBC detection and transport modeling in urban environment
6. Provide Consequence Management	• NBC weapon effects prediction in urban environments • NBC decontamination in urban environments • Integrated federal, state, and local agency operations • Medical response and long-term health risk assessment	• Integrated/comprehensive civil defense strategies, operations, and training • Non-corrosive decon. techniques • Rapid mass casualty triage and care • Improved modeling
7. Cruise Missile Defense	• Attack early warning, leakage, and defense saturation • Integrated BMC4I and multi-service interoperability • Mobile force protection	• Extended range surveillance • Integrated BMC4I interoperability • Increased lethality vs. NBC warheads
8. Collection, Analysis, and Dissemination of Actionable Intelligence to Counter Proliferation	• Prediction and identification of proliferation activities • Prediction and assessment of NBC weaponization, delivery force order of battle, and operations • Location and characterization of underground facilities	• High fidelity proliferation pathway analysis and prediction tools • Wide area underground facility detection • Country "Red Team" assessments
9. Robust Passive Defense to Enable Sustained Operations on the NBC Battlefield	• NBC protection for host nation support • NBC decontamination for fixed sites, ports, and airfields and for sensitive equipment • Detection and warning of CW/BW contamination of food and water and prepositioned equipment • NBC defense logistics requirements • Availability of collective protection shelters • No anti-nausea medication for nuclear casualties	• Unattended NBC protection, detection, and warning concepts • Low cost civilian protection gear • Improved efficiency protective gear • Nonaqueous and wide area decon. • Improved, low cost collective protection • Improved nerve agent antidotes, anticonvulsants, and skin protectants
10. BW Vaccine RDT&E and Production to Ensure Stockpile Availability	• Limited number of FDA-approved BW defense vaccines • Time required for FDA licensure • Stockpile availability for noncombatants • Protection against multiple BW agents and strains	• Rapid vaccine development and approval strategies • Broad spectrum vaccines
11. Target Planning for NBC/M Targets	• Centralized planning to support multiple counterforce options, including collateral effects mitigation	• "NBC-smart" targeting tools • Improved collateral effects modeling
12. Prompt Mobile Target Detection and Defeat	• Identification and tracking of NBC/M forces • Rapid response targeting, standoff detection, and strike • Collateral effects release potential	• Target "finger printing" and data fusion • Tags and high sensitivity NBC sensors • Unmanned strike options
13. Detection, Tracking, and Protection of NBC/M and NBC/M-Related Materials and Components	• Security costs • Reliability/motivation of foreign security personnel • Strategic intell. and wide area, continuous surveillance	• Reliable automation and telepresence • Improved foreign MPC&A, unattended sensors, and strategic intelligence
14. Support Export Control Activities of the U.S. Government	• Detection of NBC/M and related components • Proliferation prediction and trends analysis	• Rapid and reliable detection concepts • Improved analysis tools
15. Support Inspection and Monitoring Activities of Arms Control Agreements and Regimes	• Treaty implementation costs • Remote/standoff monitoring capabilities • Support for nonproliferation, IAEA sample analysis, and accountability of alternate nuclear materials • Implementation procedures for enhanced IAEA safeguard measures	• Improved automation of monitoring and inspection routines • Enhanced sensor systems and monitoring instrument integration • Additional sample analysis laboratories • Resolution of alternate nuclear materials technical issues • Risk assessment of impact on DoD ops.

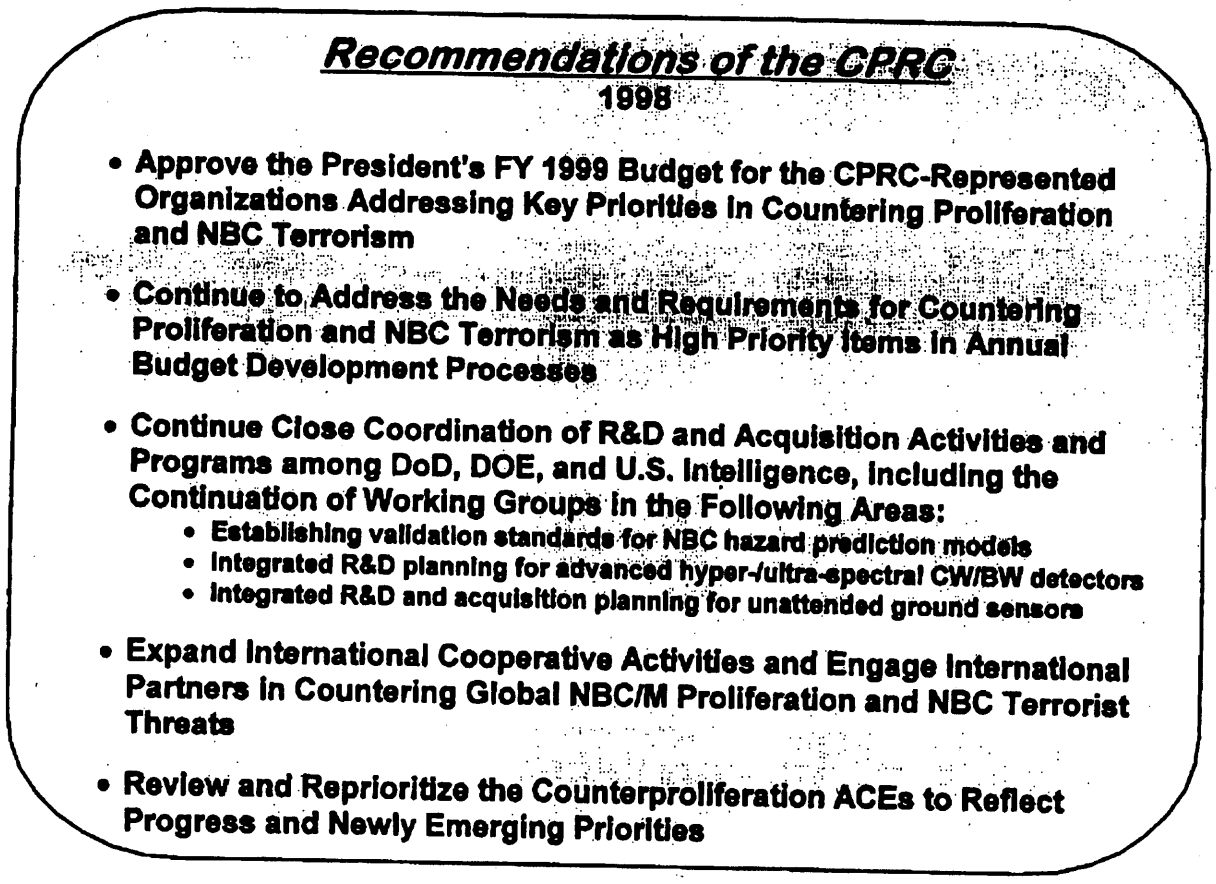

Figure 9.1 CPRC Recommendations for 1998

To continue the record of interdepartmental achievement through an integrated response to meeting the counterproliferation ACE priorities, *the CPRC recommends a continuation of the close coordination of counterproliferation-related R&D and acquisition activities and programs among DoD, DOE, and U.S. Intelligence.* To this end, the CPRC directs the CPRC Standing Committee to continue to maintain its interorganizational coordination and oversight of R&D and acquisition activities and programs to ensure that the integrated response of DoD, DOE, and U.S. Intelligence in meeting the ACE priorities, which has characterized their cooperation to date, continues.

Last year, the CPRC established Working Groups in three specific areas where improved interorganizational coordination can improve the efficiency, cost-effectiveness, and responsiveness of R&D and acquisition activities. These Working Groups are actively working toward:

- Establishing and implementing validation standards for NBC dispersion and hazard prediction models;
- Developing a user/developer integrated cooperative R&D plan for advanced state-of-the-art active/passive hyper-/ultra-spectral sensors for chemical and biological detection to

improve coordination and synergize the efforts of ongoing R&D activities of the CPRC-represented organizations; and

- Developing a user/developer integrated R&D and acquisition plan for unattended ground sensors to improve cooperation within the developer community and enhance prospects for user acceptance and "buy-in" of this maturing technology.

As discussed in Section 2.2, these Working Groups have made substantial progress in pursuing their goals and objectives, including, in particular, improving user involvement in the R&D/acquisition process. *The CPRC recommends that these Working Groups continue their activities, working closely with the NPAC TWG R&D Focus Groups and other appropriate interagency and departmental entities, until their objectives have been met or until the CPRC is satisfied that their functions can be assumed by the appropriate R&D/acquisition authorities.*

Recognizing the global nature of NBC/M proliferation and NBC terrorist threats, *the CPRC recommends continuing the development of international cooperative efforts to counter these threats by expanding existing cooperative activities in R&D, proliferation prevention, and NBC counterterrorism being conducted by DoD, DOE, and U.S. Intelligence and by working with the policy community to engage international partners to participate in cooperative R&D and acquisition efforts in the future.* The CPRC's immediate goal is to facilitate a broad interagency discussion among CPRC-represented organizations to encourage the establishment of additional international cooperative R&D efforts (beyond NATO), while expanding existing cooperative efforts, and, eventually, explore possibilities for establishing joint acquisition programs. To more effectively meet the challenges posed by the global proliferation problem, the CPRC continues to encourage and endorse joint activities with our international partners, including international information-sharing conferences and outreach programs addressing the threats of NBC/M proliferation and NBC terrorism.

The CPRC, through its Standing Committee, will continue to review and update the counterproliferation ACEs, reprioritizing them as required. This process is central to ensure that the ACEs continue to reflect the integration of CINC warfighting priorities and the overarching national security policy and strategy objectives they support. Updated and relevant ACEs assist the CPRC in meeting its program review responsibilities, while improving the focus of future programmatic and managerial efforts among the CPRC-represented organizations to counter NBC/M proliferation and NBC terrorist threats.

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APPENDICES

A. Establishment of the CPRC and Its Reporting Requirements

B. CPRC Program Review Participants

C. Summary of Key DoD Activities and Programs Strongly Related to Counterproliferation

D. Planned FY 1999 Budget Profile for DOE Programs Related to Countering Proliferation

E. Counterproliferation-Related World Wide Web Sites

F. List of Acronyms and Abbreviations

- **Intelligence Annex** (bound separately)

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APPENDIX A

Establishment of the CPRC and Its Reporting Requirements

- **CHRONOLOGY OF CPRC ESTABLISHMENT**

  - **National Defense Authorization Act for Fiscal Year 1994** (as amended)
    [Pub. L. No. 103-160, sec. 1605, 107 Stat. 1845 (1993), as amended by Pub. L. No. 103-337, sec. 1502, 108 Stat. 2914 (1994)]

  - **National Defense Authorization Act for Fiscal Year 1995**
    [Pub. L. No. 103-337, sec. 1503, 108 Stat. 2916 (1994)]

  - **National Defense Authorization Act for Fiscal Year 1997**
    [Pub. L. No. 104-201, sec. 1309, 110 Stat. 2710 (1996)]

  - **CPRC Decision to Establish CPRC Standing Committee**
    [November, 1996]

Extracts from the National Defense Authorization Acts are included in this appendix.

NATIONAL DEFENSE AUTHORIZATION ACT FOR FISCAL YEAR 1994

(as amended)

[Pub. L. No. 103-160, sec. 1605, 107 Stat. 1845 (1993), as amended by Pub. L. No. 103-337, sec. 1502, 108 Stat. 2914 (1994)]

SEC. 1605. JOINT COMMITTEE FOR THE REVIEW OF COUNTERPROLIFERATION PROGRAMS OF THE UNITED STATES

(a) ESTABLISHMENT: (1) There is hereby established a Counterproliferation Program Review Committee composed of the following members:

(A) The Secretary of Defense.

(B) The Secretary of Energy.

(C) The Director of Central Intelligence.

(D) The Chairman of the Joint Chiefs of Staff.

(2) The Secretary of Defense shall chair the committee. The Secretary of Energy shall serve as Vice Chairman of the committee.

(3) A member of the committee may designate a representative to perform routinely the duties of the member. A representative shall be in a position of Deputy Assistant Secretary or a position equivalent to or above the level of Deputy Assistant Secretary. A representative of the Chairman of the Joints Chiefs of Staff shall be a person in a grade equivalent to that of Deputy Assistant Secretary of Defense.

(4) The Secretary of Defense may delegate to the Under Secretary of Defense for Acquisition and Technology the performance of the duties of the Chairman of the committee. The Secretary of Energy may delegate to the Under Secretary of Energy responsible for national security programs of the Department of Energy the performance of the duties of the Vice Chairman of the committee.

(b) PURPOSES OF THE COMMITTEE: The purposes of the committee are as follows:

(1) To optimize funding for, and ensure the development and deployment of

(A) highly effective technologies and capabilities for the detection, monitoring, collection, processing, analysis, and dissemination of information in support of United States counterproliferation policy; and

(B) disabling technologies in support of such policy.

(2) To identify and eliminate undesirable redundancies or uncoordinated efforts in the development and deployment of such technologies and capabilities.

(3) To establish priorities for programs and funding.

(4) To encourage and facilitate interagency and interdepartmental funding of programs in order to ensure necessary levels of funding to develop, operate, and field highly-capable systems.

(5) To ensure that Department of Energy programs are integrated with the operational needs of other departments and agencies of the Government.

(6) To ensure that Department of Energy national security programs include technology demonstrations and prototype development of equipment.

(c) DUTIES: The committee shall

(1) identify and review existing and proposed capabilities and technologies for support of United States non-proliferation policy and counterproliferation policy with regard to –

(A) intelligence;
(B) battlefield surveillance;
(C) passive defenses;
(D) active defenses; and
(E) counterforce capabilities;

(2) prescribe requirements and priorities for the development and deployment of highly effective capabilities and technologies;

(3) identify deficiencies in existing capabilities and technologies;

(4) formulate near-term, mid-term, and long-term programmatic options for meeting requirements established by the committee and eliminating deficiencies identified by the committee; and

(5) assess each fiscal year the effectiveness of the committee actions during the preceding fiscal year, including, particularly, the status of recommendations made during such preceding fiscal year that were reflected in the budget submitted to Congress pursuant to section 1105(a) of title 31, United States Code, for the fiscal year following the fiscal year in which the assessment is made.

(d) ACCESS TO INFORMATION: The committee shall have access to information on all programs, projects, and activities of the Department of Defense, the Department of State, the Department of Energy, the intelligence community, and the Arms Control and Disarmament Agency that are pertinent to the purposes and duties of the committee.

(e) RECOMMENDATIONS: The committee shall submit to the President and the heads of all appropriate departments and agencies of the Government such programmatic recommendations regarding existing, planned, or new programs as the committee considers appropriate to encourage funding for capabilities and technologies at the level necessary to support United States counterproliferation policy.

(f) TERMINATION OF COMMITTEE: The committee shall cease to exist at the end of September 1996.

NATIONAL DEFENSE AUTHORIZATION ACT FOR FISCAL YEAR 1995

[Pub. L. No. 103-337, sec. 1503, 108 Stat. 2916 (1994)]

SEC. 1503. REPORTS ON COUNTERPROLIFERATION ACTIVITIES AND PROGRAMS.

(a) REPORT REQUIRED. (1) Not later than May 1, 1995, and May 1, 1996, the Secretary of Defense shall submit to Congress a report of the findings of the Counterproliferation Program Review Committee established by subsection (a) of the Review Committee charter.

(2) For purposes of this section, the term "Review Committee charter" means section 1605 of the National Defense Authorization Act for Fiscal Year 1994 (Public Law 103-160), as amended by section 1502.

(b) CONTENT OF THE REPORT. Each report under subsection (a) shall include the following:

(1) A complete list, by specific program element, of the existing, planned, or newly proposed capabilities and technologies reviewed by the Review Committee pursuant to subsection (c) of the Review Committee charter.

(2) A complete description of the requirements and priorities established by the Review Committee.

(3) A comprehensive discussion of the near-term, mid-term, and long-term programmatic options formulated by the Review Committee for meeting requirements prescribed by the Review Committee and for eliminating deficiencies identified by the Review Committee, including the annual funding requirements and completion dates established for each such option.

(4) An explanation of the recommendations made pursuant to subsection (c) of the Review Committee charter, together with a full discussion of the actions taken to implement such recommendations or otherwise taken on the recommendations.

(5) A discussion and assessment of the status of each Review Committee recommendation during the fiscal year preceding the fiscal year in which the report is submitted, including, particularly, the status of recommendations made during such preceding fiscal year that were reflected in the budget submitted to Congress pursuant to section 1105(a) of title 31, United States Code, in the fiscal year of the report.

(6) Each specific Department of Energy program that the Secretary of Energy plans to develop to initial operating capability and each such program that the Secretary does not plan to develop to initial operating capability.

(7) For each technology program scheduled to reach initial operational capability, a recommendation from the Chairman of the Joint Chiefs of Staff that represents the views of the commanders of the unified and specified commands regarding the utility and requirement of the program.

(c) FORMS OF REPORT. Each such report shall be submitted in both classified and unclassified forms, including an annex to the classified report for special compartmented information, special access programs, and special activities programs.

SEC. 1607. DEFINITIONS.

For purposes of this subtitle:

(1) The term "appropriate congressional committees" means —

(A) the Committee on Armed Services, the Committee on Appropriations, the Committee on Foreign Relations, and the Select Committee on Intelligence of the Senate; and

(B) the Committee on Armed Services, the Committee on Appropriations, the Committee on Foreign Affairs, and the Permanent Select Committee on Intelligence of the House of Representatives.

(2) The term "intelligence community" has the meaning given such term in section 3 of the National Security Act of 1947 (50 U.S.C. 401a).

NATIONAL DEFENSE AUTHORIZATION ACT FOR FISCAL YEAR 1997

[Pub. L. No. 104-201, sec. 1309, 110 Stat. 2710 (1996)]

SEC. 1309. COUNTERPROLIFERAION PROGRAM REVIEW COMMITTEE

(a) COMPOSITION OF THE COMMITTEE: Subsection 1605 of the National Defense Authorization Act for Fiscal Year 1994 (22 U.S.C. 2751 Note) is amended by adding at the end of the following new paragraph:

"(5) The Assistant to the Secretary of Defense for Nuclear and Chemical and Biological Defense Programs shall serve as executive secretary to the committee".

(b) ADDITIONAL PURPOSE OF THE COMMITTEE: Subsection (b)(1)(A) of such section is amended by inserting "and efforts, including efforts to stem the proliferation of weapons of mass destruction and to negate paramilitary and terrorist threats involving weapons of mass destruction" after "counterproliferation policy".

(c) FOUR-YEAR EXTENSION OF THE COMMITTEE: Subsection (f) of such section is amended by striking out "September 30, 1996" and inserting in lieu thereof "September 30, 2000".

(d) REPORTS ON COUNTERPROLIFERATION ACTIVITIES AND PROGRAMS: Section 1503 of the National Defense Authorization Act for Fiscal Year 1995 (22 U.S.C. 27561 note) is amended –

(1) in subsection (a) –

(A) by striking out "REPORT REQUIRED.– (1) Not later than May 1, 1995 and May 1, 1996, the Secretary" and inserting in lieu thereof "ANNUAL REPORT REQUIRED. – Not later than May 1 of each year, the Secretary"; and

(B) by striking out paragraph (2); and

(2) by adding at the end of the following new subsections:

"(d) REVIEW COMMITTEE CHARTER DEFINED. – For purposes of this section, the term 'Review Committee charter' means section 1605 of the National Defense Authorization Act for Fiscal Year 1994 (22 U.S.C. 2751 note).

"(e) TERMINATION OF REQUIREMENT. – The final report required under subsection (a) is the report for the year following the year in which the Counterproliferation Program Review Committee established under the Review Committee Charter ceases to exist."

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APPENDIX B

CPRC Program Review Participants

- **CPRC Principals**

  Honorable John J. Hamre - CPRC Chairman, Deputy Secretary of Defense

  Dr. Earnest J. Moniz - CPRC Vice Chairman, Under Secretary of Energy

  Dr. Jacques S. Gansler - CPRC Executive Secretary, Under Secretary of Defense for Acquisition and Technology (and acting Assistant to the Secretary of Defense for Nuclear and Chemical and Biological Defense Programs)

  Mr. John Lauder - Special Assistant to the Director of Central Intelligence for Nonproliferation

  RADM James W. Metzger, USN - Deputy Director for Strategy and Policy, Joint Chiefs of Staff (J-5)

- **CPRC Standing Committee**

  Dr. Jacques S. Gansler, Chairman - Under Secretary of Defense for Acquisition and Technology (and acting Assistant to the Secretary of Defense for Nuclear and Chemical and Biological Defense Programs)

  Ms. Rose Gottemoeller, Vice Chairman - Director, Office of Nonproliferation and National Security, Department of Energy

  Mr. John Lauder - Special Assistant to the Director of Central Intelligence for Nonproliferation

  RADM James W. Metzger, USN - Deputy Director for Strategy and Policy, Joint Chiefs of Staff (J-5)

  Mr. H. Allen Holmes - Assistant Secretary of Defense for Special Operations/Low-Intensity Conflict

- **Other Senior Participants**

  CAPT Pat Casey, USN - Joint Staff (J-5) and Deterrence/Counterproliferation Joint Warfighting Capability Assessment (JWCA) Team

  Mr. Robert C. Doheny - Director for Acquisition, Office of the Assistant Secretary of Defense for Special Operations/Low-Intensity Conflict

  Dr. Gloria Patton - Senior Policy Adviser, DoD/DOE Liaison, and CPRC Action Officer Executive Director, Office of the Assistant to the Secretary of Defense for Nuclear and Chemical and Biological Defense Programs

  Dr. Ted Warner - Assistant Secretary of Defense for Strategy and Threat Reduction

Mr. Walter Busbee - Deputy for Counterproliferation and Chemical/Biological Defense, Office of the Assistant to the Secretary of Defense for Nuclear and Chemical and Biological Defense Programs

Mr. Michael Potter - DCI Nonproliferation Center

Mr. Robert E. Waldron - Director, Office of Research and Development, Office of Nonproliferation and National Security, Department of Energy

Dr. James Miller - Deputy Assistant Secretary of Defense for Requirements, Plans, and Counterproliferation

- **CPRC Action Officers**

Ms. Alane Andreozzi-Beckman - Counterproliferation Program Office, Defense Special Weapons Agency

Maj Lynne Baldrighi, USAF - Strategy and Concepts, Policy Division, U.S. Air Force (AF/XONP)

CDR Ken Blevins, USN - Office of the Deputy Assistant to the Secretary of Defense for Counterproliferation and Chemical/Biological Defense

Dr. Salvatore Bosco - Special Assistant for Chemical/Biological Matters, Office of the Deputy Assistant to the Secretary of Defense for Counterproliferation and Chemical/Biological Defense

LTC Mike Brown, USA - Joint Staff (J-5)/Counterproliferation Joint Warfighting Capability Assessment (JWCA) Team

Ms. Tracy Cronin - Office of Special Technology

Mr. Steve Day - Office of the Deputy Assistant to the Secretary of Defense for Counterproliferation and Chemical/Biological Defense

LTC James DeBroux, USA - Policy Analyst, Office of the Deputy Chief of Staff for Operations and Plans, Headquarters, Department of the Army

Dr. Mildred Donlon - Program Manager, Biological Weapon Defense, Defense Advanced Research Projects Agency

LtCol Ken Firoved, USMC - U.S. Marine Corps

LtCol Jan Fladeboe, USMC - On-Site Inspection Agency, Interagency Affairs

Mr. Mark Flohr - Office of the Deputy Assistant to the Secretary of Defense for Counterproliferation and Chemical/Biological Defense

MAJ Tony Francis, USA - Office of the Deputy Chief of Staff for Operations and Plans, Chemical and Nuclear Biological Chemical Defense Division

Lt Col Michael Glaspy, USAF - Counterproliferation Policy, Office of the Deputy Assistant Secretary of Defense for Requirements, Plans, and Counterproliferation

Mr. Chuck Gonzales - Office of the Assistant Secretary of Defense for Command, Control, Communications and Intelligence

CDR Randy Grimm, USN - Nuclear Deterrence/Counterproliferation Joint Mission Area Working Group Chairman (OPNAV N87D1)

Maj Max Hanessian, USAF - Strategy and Concepts, Policy Division, U.S. Air Force (AF/XONP)

Dr. Elisa Harris - National Security Council

LCDR Paul Haynes, USN - Counterproliferation of Strategic Warfare

Col Reed Heddleston, USAF - Executive Assistant for Counterproliferation, Office of the Deputy Assistant to the Secretary of Defense for Counterproliferation and Chemical/Biological Defense

Dr. Gregory Henry - Office of Management and Budget

Mr. Rob Irvine - Director, Counterproliferation Policy, Office of the Assistant Secretary of Defense for Strategy and Threat Reduction

MAJ Mark Malatesta, USA - Joint Program Office for Biological Defense

Mr. John Mentz - Office of the Under Secretary of Defense for Acquisition and Technology

Lt Col Howard Meyer, USAF - Office of the Deputy Assistant to the Secretary of Defense for Counterproliferation and Chemical/Biological Defense

MAJ Edward Mount, USA - On-Site Inspection Agency, Interagency Affairs

LTC Jim Murphy, USA - Joint Staff (J-5)

Lt Col Jim Player, USAF - Strategy and Concepts, Policy Division, U.S. Air Force (AF/XONP)

CAPT Ed Quirk, USN - Office of the Deputy Assistant to the Secretary of Defense for Cooperative Threat Reduction

CAPT David F. Smith, USNR - Office of the Assistant Secretary of Defense for Command, Control, Communications, and Intelligence

Mr. Markham Smith - Office of the Deputy Assistant to the Secretary of Defense for Counterproliferation and Chemical/Biological Defense

Mr. Richard Soskin - Defense Technology Security Administration

COL Carmen Spencer, USA - Executive Assistant for Chemical/Biological Defense, Office of the Deputy Assistant to the Secretary of Defense for Counterproliferation and Chemical/Biological Defense

Ms. Janet Strafer - Office of the Deputy Chief of Staff for Operations and Plans, Headquarters, Department of the Army

Mr. Mark Swiecicki - U.S. Arms Control and Disarmament Agency

LtCol Landon Thorne, USMC - United States Marine Corps

Lt Col Mike Williams, USAF - Assistant for Special Operations Acquisition

LCDR Marcy Wilson, USN - Office of the Assistant Secretary of Defense for Command, Control, Communications, and Intelligence

Mr. Alan Yuriditsky - Defense Intelligence Agency

CPT Maria Zumwalt, USA - Joint Staff (J-5)

APPENDIX C

Summary of Key DoD Activities and Programs Strongly Related to Counterproliferation

Introduction. In the tables that follow, the Counterproliferation Support Program (Table C.1) and the Chemical and Biological Defense Program (Table C.2) are summarized along with other key Service (Tables C.3 - C.5), DoD Agency (Tables C.6 - C.8 and C.10 - C.12), OSD (Table C.9), and Joint Staff (Table C.13) activities and programs strongly related to counterproliferation. The summaries include: program/project title, program description, program accomplishments, key program milestones, relevant DoD counterproliferation ACE priorities, program/project executing agencies, FY 1999 budget figures, and Program Element (PE) number. It should be noted that detailed program descriptions, including project accomplishments, milestones, and plans are provided to Congress annually as part of the President's Budget. Accomplishments and milestones cited in the following tables represent selected highlights rather than an exhaustive characterization of counterproliferation-related activities and programs.

Please be advised that the Defense Reform Initiative calls for the consolidation of DSWA, OSIA, DTSA, and other OSD offices into a single new DoD agency called the Defense Threat Reduction Agency effective October 1, 1998. As a result, a unified DTRA budget has been prepared for FY 1999. For consistency with previous CPRC reports, this appendix provides separate OSIA, DSWA, and DTSA budgets.

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Table C.1: Counterproliferation Support Program Projects

Program/Project Title	Project Description	Project Accomplishments	Key Milestones	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
Proliferation Prevention • Nuclear Matters Projects	• Assessments of reliability, safety, surety, and sustainability of the nuclear stockpile	• Continue DoD oversight of DOE stockpile stewardship and advisory support to Secretary of Defense • Prepared annual Nuclear Weapons Deployment Request to President	• Continue management and oversight support activities	5, 2, 3	ATSD (NCB)	2.012	605160BR
Strategic/Tactical Intelligence • High Frequency Active Auroral Research Project (HAARP)	• Single source transmission of long wavelength electromagnetic waves for underground structure detection and imaging	• Long-wave imaging workshop held and industry solicitations released • Field tests to image known underground structure completed • Field data for "blind" imaging test collected	• Award industry contracts FY98 • Complete "blind" test analysis FY98 • Upgrade facility power and demonstrate local imaging capability FY99 • Activate full-power operations and demonstrate global imaging capability FY05	3, 8	ATSD (NCB) Air Force	0*	603160BR
Battlefield Surveillance • Tactical UGS System (TUGS) Project	• Continuous surveillance, target characterization, and BDA of NBC/M and underground facilities	• Continued data collection to evaluate performance and demonstrate utility • Finalized ACTD design	• Template CW/BW facilities for characterization and identification • Participate in CP1 ACTD demonstrations • Conduct manufacturing and engineering	2, 3, 8	DSWA DOE	3.400	603160BR
• Tactical FLIR Pod Modification (TFPM)	• Improved BDA of NBC/M and underground facilities • UAV sensor integration assessment	• Developed design options, initiated proof-of-principle demonstrations, and collected imagery to improve and support weapon delivery testing • Completed design of modified pod to include radiometer and digital recorder • Designed digital exploitation system	• Participate in CP1 ACTD demonstrations FY98 • Complete digital exploitation software • Transition to USEUCOM • Conduct manufacturing engineering	2, 3, 8	DSWA Air Force	5.408	603750D
• UAV-Based Collateral Effects Assessment Sensors	• UAV-based detection, identification and tracking of CW collateral effects	• Initiated in FY98 as part of CP2 ACTD	• Complete Predator and remote sensor design FY99; Predator flight test FY99 • Complete multi-UAV and point sensor design FY00; integrate on Predator FY01 • Demonstrate full assessment capability FY03	2, 3, 8	DSWA NRL Air Force	12.450	603160BR
• Tactical Multi-Sensor Data Fusion	• RDT&E to support NBC/M and underground target characterization and BDA	• Conducted user demonstrations and training • Used in CP1 ACTD	• Validation with TUGS and FLIR data and full-up validation tests FY98	2, 3, 8,11	DSWA	0.250	603750D

* Currently, no FY 1999 funds are requested for this Congressional Special Interest Program.

Table C.1: Counterproliferation Support Program Projects (continued)

Program/Project Title	Project Description	Project Accomplishments	Key Milestones	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
Counterforce							
• Collateral Effects Phenomenology Assessment	• Source term characterization transport prediction, phenomenology experiments, and assessment tool development	• Fielded HPAC ver 3.0 • Accurate prediction of atmospheric transport of hazard plumes during CP1 ACTD demos	• Integrate HPAC ver 3.0 into IMEA FY98 • CP1 ACTD demonstration support FY98 • Integrate HPAC ver 4.0 into IMEA FY99	2, 3, 11	DSWA	8.100	603160BR
• Advanced Weapon Systems (AUP, HTSF, and ITAG) and CP2 ACTD Standoff Weapon Enhancements	• Development of enhanced penetrating munition for hard and underground target defeat offering expanded compatibility with delivery platforms and an all-weather capability • Weapon system procurement	• Demonstrated controlled weapon penetration depth using HTSF • Integration of GBU-24/HTSF with F-15E and F/A-18 • ITAG software simulation and flight testing • Completed AUP flight tests	• CP1 ACTD demonstration tests FY98 • Deliver AUP/HTSF to Services 4QFY98 • Initiate penetrating warhead development for CALCM and TLAM 2QFY99 • Demo CALCM FY00-01 • Demo TLAM FY03	2, 3	DSWA Air Force DOE Navy	18.779 16.833	603160BR Procurement
• NBC/M Target Planning and Response/ Vulnerability Assessment	• Experimental and analytical analyses of target response/vulnerability and automated target planning for NBC/M facilities	• Developed and validated models for conventional weapons effects against hard and buried targets • Fielded IMEA ver 2.0 to EUCOM and continued modeling support for contingency operations • Released IMEA ver 3.0	• CP1 ACTD demonstration support FY98 • Release IMEA ver 4.0 1QFY99	11, 2, 3, 5	DSWA	5.500	603160BR
• Counter-proliferation ACTDs (CP1 and CP2)	• Integrated operational testing to support early deployment of new counterforce capabilities against NBC/M and underground targets	• Completed integrated sensor, weapons, and planning tool demonstrations of the CP1 ACTD • Conducted static detonation and live weapon drops on simulated BW storage facility • Completed CP2 ACTD planning	• Complete CP1 ACTD demonstrations FY98 • Deliver CP1 residual capabilities to CINC EUCOM FY98-99 • Conduct CP2 demonstrations FY98-02	2, 3, 11, 8	DSWA EUCOM	6.719	603160BR
Passive Defense							
• JBREWS ACTD	• Accelerate fielding of warfighting capabilities for remote detection, identification, characterization, and early warning of BW agent attacks	• CINC EUCOM and CENTCOM sponsors identified • USD(A&T) approval and management plan under development • Technical architecture, concept studies, and systems definition under way	• Preliminary Design Review 2QFY98 • Critical Design Review 1QFY99 • Conduct field demonstrations FY00 • EMD transition FY00	1, 9, 8	JPO-BD	31.790	603884BP
• Eye Safe LR-BSDS for BW Detection	• Accelerated deployment of airborne eye safe IR LIDARS for standoff battlefield BW aerosol detection and track	• System design completed • Program restructured to accommodate reduced funding • Milestone II for two prototypes	• IOC and Milestone III for 4 systems 4QFY99 • First Unit Equipped FY99 • Transition to procurement FY00	1, 9	JPO-BD Army	11.275	603884BP

Table C.1: Counterproliferation Support Program Projects (continued)

Program/Project Title	Project Description	Project Accomplishments	Key Milestones	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
• RESTOPS Proposed ACTD	• Planning and analysis exercises to prepare for a FY00 ACTD start	• New effort	• ACTD approval • Complete approved management plan	9, 1	ATSD (NCB)	1.942	603384BP
• BW Detection Advanced Technology Development	• Demonstration and rapid fielding of selected man-portable and UAV-integrated BW detectors for remote detection and characterization of BW agents	• 3 FOWG units delivered to CBIRF; demonstrated improved detector • Successful bench test of mass spectrometer • Conducted biological background sampling at Osan, Korea	• Mass spectrometer prototype field testing 4QFY98 • Detector testing as part of JBREWS ACTD FY99	1, 9	JPO-BD DARPA	5.431	603384BP
Counter Paramil./ Terrorist Threats • First Responder Support	• Accelerated development of capabilities and technologies to enhance interagency response to CW/BW threats	• Delivered 4 Chem./Bio. Sentry Systems • Completed testing and evaluation of escape hood • Field tested BW Detection Kit during 911-Bio ACTD	• Complete user field trials of BW Detection Kit FY98	6, 5	TSWG	1.381	603160BR
• Specialized SOF Technologies and Prototype Devices	• Specialized SOF technologies to detect, disable, render safe, and recover critical components from NBC devices in a nonpermissive and time-sensitive environment	• Specific details are classified	• Specific details are classified	5	SOCOM	14.282	603160BR
CP Architecture Studies and Management/ Oversight	• Analysis, architecture, and technical studies; integrated planning; and management and oversight support	• Preparation of CPRC annual report to Congress • Manage Counterproliferation Support Program	• Continue program management and oversight activities • Continue preparation of CPRC annual report to Congress	2, 3, 1, 5, 6, 9, 11, 13	ATSD (NCB) DSWA	7.862	605160BR
				• Total:		153.414	

Table C.2: Chemical and Biological Defense Program

Program/Project Title	Project Description	Project Accomplishments	Key Milestones	DoD ACE	Agency*	FY 99 Budget [$M]	PE No.
Passive Defense							
• Chemical/ Biological Defense (Non-Medical)	• Basic research in chemistry, life sciences, and physics in support of CW/BW defense	• Conducted a coordinated and consolidated mass spectrometric study of biomarkers having potential utility in future mass spectrometry based biodetectors	• Basic Research	1, 9	Army	2.382	601384BP
• Medical Chemical Defense: Basic Research	• Basic research on medical countermeasures to CW agents	• Established assays to quantify DNA repair activity • Characterized second-generation enzyme molecules for detoxification of CW agents • Evaluated candidate reactive skin protectants for CW agents	• Basic Research	9	Army	8.034	601384BP
• Medical Biological Defense: Basic Research	• Basic research leading to the development of drugs and vaccines for BW defense	• Studied pathogenic mechanisms of toxins, bacteria, and viruses • Identify potential vaccine candidates • Evaluate alternative vaccination strategies	• Basic Research	9, 10	Army	14.866	601384BP
• Chemical/ Biological Defense: Applied Research	• Numerous applied research activities in CW/BW detection and warning, individual and collective protection, decontamination, and modeling support	• Continued simulation and wargaming of CW/BW attack profiles • Continued evaluation of BW agents local warning detection technologies and compilation of UV database	• Extend development of fixed site CW/BW effects on air bases, ports, and depots FY99 • Continue evaluation and transition of local and early warning BW detection technologies FY99 • Complete studies on fluids for sensitive equipment decontamination FY99	9, 1	Army	31.587	602384BP
• Medical Biological Defense: Applied Research	• Applied research on drugs and vaccine candidates for BW defense	• Tested vaccine candidates for brucella, plague bacilli, encephalitis viruses (VEE, WEE, EEE), botulinum, neurotoxins, staphylococcal enterotoxins (SE), and filoviruses • Developed immunoassay reagents for filoviruses • Identified antiviral compounds for poxviruses	• Applied Research	9, 10	Army	12.034	602384BP
• Medical Chemical Defense: Applied Research	• Exploratory development of treatments for CW agent casualties	• Characterized proleolytic activity and defined specific protease inhibitors against CW exposure in animals • Characterized reactive topical skin protectants • Investigated potential treatments and diagnosis for low-dose exposure to CW agents	• Continue applied research on skin decontamination, nerve agent countermeasures, and diagnostic technologies	9	Army	14.062	602384BP

* All Chemical and Biological Defense Program projects are funded through DoD-wide accounts and are generally Joint Service programs. The lead Service or Agency executing the project is listed.

Table C.2: Chemical and Biological Defense Program (continued)

Program/Project Title	Project Description	Project Accomplishments	Key Milestones	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
• Medical Biological Defense: Concept Exploration	• Expanded nonclinical testing and evaluation of BW vaccine candidates and drugs	• Nonclinical safety and efficacy testing of vaccine candidates completed for VEE • Assessed prototype monovalent vaccine for brucella • Initiated testing of filovirus vaccine candidate • Initiated nonclinical safety and efficacy testing of ricin vaccine candidate with non-human primate animal models • MS I transition package for VEE in preparation	• MS 0: SEB vaccine, VEE vaccine, improved anthrax vaccine (recombinant protective antigen), recombinant botulinum neurotoxin vaccine, and ricin vaccine	10, 9	Army JPO-BD	14.004	603384BP
• Medical Chemical Defense: Life Support	• Advanced technology development for new medical countermeasures for CW agents	• Assessed antivesicant compounds screened in cell viability assays • Prepared 66 candidate formulations for evaluation and identified 33 candidate reactive moieties for reactive skin protectants • Initiated safety assessment and immunologic response to nerve agent scavengers • Developed and validated animal models to evaluate new decontamination procedures	• Perform efficacy and safety studies of candidate vesicant treatments leading to Dem/Val down-selection • Construct MS I final data package for advanced anticonvulsant FY99	9	Army	9.747	603384BP
• Chemical/Biological Defense Systems: Advanced Technology Development	• Technology demos in CW/BW agent detection/identification, decontamination, and individual/collective protection	• CBMS: conducted chemical profiling for NBCR and technical feasibility and production proveout testing; completed technical/logistics documentation • JSLSCAD: prepared documentation and conducted MS II IPR; conducted simulant and live agent testing, hardware and software redesigns, and interface trials with candidate transport systems • Developed technology to improve BW point detection and demonstrated remotely deployed area warning network as part of the Integrated Biodetection ATD.	• Bio ATD: Conduct warfighting experiment demonstrating bio point detection and remote early warning technologies • Select optimal materials for dry powder decontamination applicator and transition to MDS FY99	9, 1	Army	11.638	603384BP
• Decontamination: Dem/Val	• Modular Decontamination System and advanced sorbent technology Dem/Val	• MDS: conducted PPQT and IOT&E • Sorbent: completed phase I effectiveness studies of baseline candidate material; initiated phase II optimization studies for down-selected materials; integrated sorbent materials into M295 kit	• MDS: prepare MS III IPR FY98; award production contract FY99 • Sorbent: fabricate, test, and evaluate Operation Sprayer prototype; award program phase III contract FY99	9	Army	4.422	603884BP
• Medical Chemical Defense: Dem/Val	• Advanced development and validation of pre-treatments and antidotes for CW agents and casualty decontamination	• Demonstrated the human safety and technical performance of the cyanide pretreatment • Initiated validation of methemoglobin monitor	• Complete validation and testing of methemoglobin monitor • Toxicity and efficacy evaluation of advanced anticonvulsant FY99	9	Army	2.220	603884BP

Table C.2: Chemical and Biological Defense Program (continued)

Program/Project Title	Project Description	Project Accomplishments	Key Milestones	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
• Medical Biological Defense: Program Definition and Risk Reduction	• Pilot lot manufacture of clinical grade material and Phase I and Phase II clinical testing of vaccines and medical products	• Awarded prime systems contract for advanced development of tularemia, vaccinia and Q-fever through the Joint Vaccine Acquisition Program • Developed surrogate marker data for FDA licensure of botulinum neurotoxin pentavalent toxoid vaccine • Initiated work with Prime Systems Contractor on PDRR testing of tularemia, vaccinia and Q-fever vaccines	• Conduct Clinical Trial and identify Pilot Lot Manufacturer for Vaccinia vaccine	10	JPO-BD	8.793	603884BP
• Biological Defense: Dem/Val	• Program definition and risk reduction for point and remote BW detection systems	• JBPDS: Initiate concept development/design and chamber/field tests of candidate Block II biological suite components • Conduct effectiveness analysis of candidate biological detector components for Blocks I and II	• JBPDS: Continue concept development/design and tests • Conduct analysis of potential BW detector components Blk II FY99	1, 9	JPO-BD	1.904	603884BP
• Collective Protection: EMD	• NBC collective protection shelter development	• Shipboard collective protection equipment: integration high pressure fan and filter improvements	• Complete component integration and evaluation	9	Navy	1.237	604384BP
• Contamination Avoidance: EMD	• EMD of NBC detection and warning systems (NBCRS/LNBCRS, MICAD, SCAMP, SALAD, JWARN, JCAD, CBMS, and JSLSCAD)	• ACADA: developed surface sampling capacity • CBMS: completed design modifications for Block II • JCAD: tested hardware and prepared documentation for EMD contract award • JSLSCAD: initiated design of EMD hardware and system integration into fixed site, ground vehicle, and air applications • JSLNBCRS: system integration of high mobility multi-purpose wheeled vehicle variants • MICAD: conducted PPQT; initiated IOT&E; fabricated, tested, and initiated integration of installation kits • SALAD: initiated developmental testing and preparation of production contract • JWARN: conducted MS III for phase IA product and initiated phase II	• CBMS: develop final design; conduct tests FY99 • JCAD: conduct DT&E flyoff; continue systems integration FY99 • JSLSCAD: complete testing of fixed site, ground, and air systems • JSLNBCRS: system integration of light armored vehicle variant • MICAD: conduct MS III IPR • JWARN: continue phase II development; conduct DT/OT	9, 1	Army	44.244	604384BP
• Individual Protection: EMD	• EMD for JSLIST, the EOD ensemble, and the naval aircrew CW/BW NDI respirator	• JSLIST: completed MS III and final specifications • JSLIST P3I: completed industry market survey; initiated material screening tests on items received from industry • AERP: continue aircraft modification designs • Continued EMD and support production for Joint Service program improved toxicological agent protective suit	• JSLIST P3I: procure prototypes and continue field evaluation; review specification for technology insertion; develop CW environment survivability suit and long duration CW protective mask for SOF FY99 • AERP: continue modification integration FY99	9	USMC	10.718	604384BP

Table C.2: Chemical and Biological Defense Program (continued)

Program/Project Title	Project Description	Project Accomplishments	Key Milestones	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
• Decontamination: EMD	• EMD of Joint Service Fixed Site Decontamination (JSFXSD)	• Conducted hazard analysis; BW agent decon field trial; chemical reaction, aircraft decon, and initial decon efficiency tests	• Prepare test plans for selected decon equipment • Procure prototypes and conduct development tests	9	USMC	3.923	604384BP
• Medical Chemical Defense: EMD	• EMD of medical materials necessary for medical defense	• Prepared New Drug Application (NDA) for topical skin pretreatment (TSP) • Initiated human exercise performance, definitive effectiveness studies, and stability testing for cyanide pretreatment • Continue development and testing of multi-chambered autoinjector	• Conduct effectiveness and safety studies for cyanide pretreatment • Update regulatory documents and conduct LRIP for TSP • Conduct stability testing for autoinjector	9	Army	1.742	604384BP
• Medical Biological Defense: EMD	• Expanded manufacture and Phase 2 clinical testing of vaccines and medical products • Complete surrogate efficacy studies	• Data collected to support change of FDA license to reduce the number of shots needed for anthrax vaccine from 6 to 5 • Prepared protocol for clinical trials required for licensure of pentavalent botulinum neurotoxin toxoid vaccine • Awarded Prime Systems Contract for advanced development of tularemia, vaccinia, and Q-fever through the Joint Vaccine Acquisition Program	• Q-fever: perform clinical trial; conduct animal testing • Tularemia vaccine: evaluate current data	10, 9	JPO-BD	15.203	604384BP
• Nonmedical BW Defense: EMD	• Detection of BW threats to provide early warning, including development of the Portal Shield ACTD	• BIDS: completed design, technical documentation, PPQT, and IOT&E • IBAD: continued support of rapid prototype development and installation on naval ships • JBPDS: initiated critical item testing of Block I suite components and conducted Joint field trials • ACTD: continued development; conducted final operational test at Dugway Proving Ground • Initiated Critical Reagent Program	• ACTD: field 5 Portal Shield units at CENTCOM/U.S. Forces Korea air base/port sites • CRP: Develop 4-5 antibody-based reagents and prototype hand-held assays • JBPDS: complete PPQT for shipboard, fixed-site, S788 shelter, and man-portable configurations	1, 9	JPO-BD Army Navy	48.245	604384BP
• Joint CW/BW Contact Point and Test	• Repository of CW/BW information for multiple users	• Conducted 6 assessments, 3 field trials, and 2 laboratory tests evaluating CW defense equipment to support Service doctrine, policy, and training procedures development	• Management Support	9	ATSD (NCB) Army	1.662	605384BP
• Joint Training and Doctrine Support	• Development of Joint Doctrine and Tactics, Techniques, and Procedures for CBD systems	• New Program for FY 1999	• Preparation of Joint Doctrine and TTP for JWARN, JCAD, JSLSCAD, and JBPDS	1, 9, 10	Army JPO-BD	3.652	605384BP
• Management Support	• Oversight and integration of CBD Program	• Continued to perform program oversight, assessment, and policy development	• Management Support	9, 1, 10	Services	6.286	605384BP

Table C.2: Chemical and Biological Defense Program (continued)

Program/Project Title	Project Description	Project Accomplishments	Key Milestones	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
• Dugway Proving Ground	• Operation of test facilities	• Maintaining test facility readiness	• Management Support • Continue operations	9, 1	Army	10.370	605384BP
Procurement							
• M40 Mask	• Procurement of M40 protective mask	• Continued procurement	• Production and deployment	9	Army	16.046	0300D, BA3 M99601
• PATS	• Protection Assessment Test System procurement	• Continued procurement	• Production and deployment	9	Army	5.376	0300D, BA3 M95801
• ICAM	• Improved Chemical Agent Monitor	• Continued procurement	• Production and deployment • FUE by 2QFY99	9	Army	9.537	0300D, BA3 S02201
• FOX M93A1 NBCRS	• FOX NBC Recon. System Block I Modification	• Continued procurement	• Production and deployment • FUE FY99	9, 1	Army	26.242	0300D, BA3 MA0601
• Pocket RADIAC	• Compact radiation measuring device	• Continued procurement	• Production and deployment	9	Army	3.288	0300D, BA3 B96801
• Chem/Bio Protective Shelter	• CBPS collective protection shelter	• Continued procurement	• Production and deployment	9	Army	16.544	0300D, BA3 R12301
• Transportable Collective Protection System	• Procurement of Air Force adaptable shelters	• Production contract awarded FY98	• Production and deployment	9	Air Force	3.908	JF0102 0300D, BA3
• M17 Lightweight DecontaminationSystems (LDS)	• Procurement of the M17A3 and M17A4 LDS	• Continued procurement	• Production and deployment • Initial production of M17A4 FY99	9	Army	4.884	M67401 0300D, BA3
• Shipboard Detector Modifications	• Procurement of IPDS and SALAD	• Continued procurement of IPDS	• Production and deployment • SALAD: initial procurement FY99; MS IV/full rate production decision 4QFY00	9, 1	Navy	9.207	0300D, BA3 N00041
• BIDS P3I	• Improvements to NDI BIDS	• Initial production contract awarded FY97	• Integrate/phase components into JBPDS platform production FY99 • FUE by 4QFY99	1, 9	Army JPO-BD	15.014	0300D, BA3 M93001
• M45 Air Crew Protective Mask	• Procurement of the M45 mask	• Continued procurement	• Production and deployment	9	Army	2.211	0300D, BA3 M99501
• Chem/Bio Respiratory System - Aircrew	• Provide USN/USMC aircrews with CW/BW respiratory protection	• Continued procurement	• Production and deployment	9	Navy USMC	7.390	0300D, BA3 N00020
• AERP Aircraft Modifications	• Second generation CW/BW oxygen mask	• Continued procurement	• Production and deployment	9	Air Force	4.117	0300D, BA3 JN0011
• ACADA, M22 • CW Detector	• Procurement of ACADA	• Continued procurement	• Production and deployment	9	Army	29.858	0300D, BA3 M98801
• Protective Clothing	• Procurement of JSLIST, EOD Ensemble, and Fire Fighters' Ensemble	• Continued procurement	• Production and deployment	9	USMC	92.010	0300D, BA3 MA0400

Table C.2: Consolidated Chemical and Biological Defense Program (continued)

Program/Project Title	Project Description	Project Accomplishments	Key Milestones	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
• Individual Protective Gear	• Initial outfitting of protective equipment for naval construction	• Continued procurement	• Production and deployment	9	Navy	0.584	0300D, BA3 JN0013
• Medical BW Defense: Vaccine Procurement	• Procurement of vaccines and medical products	• Completing anthrax vaccine stockpile, improvements to production facility, resolution of FDA compliance issues • Storage and maintenance of current BW defense stockpile by the Prime Systems Contractor • Vaccine and anti-sera storage and testing	• Production and deployment	10, 9	JPO-BD Army	11.074	0300D, BA3 JX0005
• Modular Decon System (MDS)	• Procurement of the MDS	• Initial production contract to be awarded FY 1999	• Initial production	9	Army	6.035	G47001
• JWARN	• Procurement of JWARN	• Procurement of JWARN Phase I	• Production of JWARN (MICAD component)	1,9	USMC Army	10.252	G47101
• System Fielding and Support/Spares	• Procurement of support equipment, spare and repair parts for CBD systems	• Continued procurement	• Production and deployment	1,9	Joint Service	1.827	JX001,-2,-3
• Guard and Reserve Equipment	• Procurement of CBD equipment for Reserve Component	• Initial procurement for Reserve Component in FY 1999 to support NBC consequence management	• Procurement and deployment	1,9	OSD	6.900	JA0004
• Critical Reagents Program (CRP)	• Provide Total Life Cycle management for the critical reagents necessary for BW detection systems	• Developed a chartered program using the Critical Reagents Integrated Product Team (CRIPT); consolidated critical reagent supplies and requirements • Resourced the CRP in the current POM • Awarded contract for limited prototype production of hand-held assays (HHA)	• Complete development and selection of 10 key antibodies FY99 • Award a multi-year HHA production contract FY99	1	JPO-BD	1.759	208384BP JP0210
Counter Paramil/ Terrorist Threats • Anti-Terrorism Support	• Vulnerability assessments of DoD installations to CW/BW threats	• New program for FY 1998	• Continue vulnerability assessments and training	5	Services	2.952	605384BP
				• Total:		569.846	

Table C.3: Key U.S. Army Programs Strongly Related to Counterproliferation

Program/Project Title	Project Description	Project Accomplishments	Key Milestones	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
Active Defense							
• PATRIOT PAC-3 Procurement	• Procurement of 52 PAC-3 missiles, 11 PAC-3 launch stations, 6 radar station modification kits, and communications upgrade kits	• Two successful PAC-3 test fires • Phase III radar station successfully tested during live fire exercises	• PAC-3 LRIP DAB 2QFY98	4, 7	Army	15.300	C50700
• PATRIOT PAC-3 RDT&E	• RDT&E for the Remote Launch Communications Enhancement Unit, threat simulations, and P3I testing	• Completed RDT&E for the Remote Launch Communications Enhancement Unit	• Continue P3I system development and testing	4, 7	Army	9.285	203801A
• Army TMD BMC4I Procurement	• Provides JTIDS terminals for platform interoperability in support of TMD	• Ensured single configuration for all terminals	• Provide TMD interoperability for multiple platforms	4, 7	Army BMDO	6.300	208864C
Passive Defense • All Army Passive Defense Programs have been incorporated into the CBD Program (see Table C.2)							
					• Total:	30.885	

Table C.4: Key U.S. Navy Programs Strongly Related to Counterproliferation

Program/Project Title	Project Description	Project Accomplishments	Key Milestones	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
Proliferation Prevention • SEI System Support Program	• Procurement and fleet integration of SEI system upgrades to aid in tracking NBC/M-related shipments	• Program transitioned from Counter-proliferation Support Program • Implementation into fleet by upgrading existing processors; critical design review completed	• Upgraded processor testing and evaluation 3QFY98 • Fleet integration FY99	13	Navy	2.360 0.430	204575N O&M
Counterforce • Navy Hard Target Munitions Program	• Cooperative Navy/Army development of a conventional earth penetrating variant of the Army's Tactical Missile System • Supports HDBTDC program	• Designed for TACMS missile modifications, interface, and reentry body • Conducted mid-scale penetrator high-g impact and lethality testing	• Conduct full-scale penetrator/fuse/HE tests • Conduct fuse testing at velocities up to 4kft/sec	3, 2, 5, 8, 11	Navy Army	9.827	604327N
Active Defense • USMC Radar Upgrades	• Upgrade AN/TPS-59 radar to improve low radar cross section target detection; introduction of HAWK CWAR as a low altitude surveillance radar	• Completed successful TMD target detection and hand-offs during HAWK TBM testing at White Sands Missile Range and Kwajalein Atoll	• IOC AN/TPS-59 upgrades: 4QFY98 • IOC for Cooperative Engagement Capability integration: 2QFY99	4, 7	USMC	8.354	Modification
• Navy Area TBMD Procurement	• Procurement of Cooperative Engagement System • Procurement of SM-2 Blk IVA missiles for Navy Area TBMD	• Commenced AEGIS area software testing	• SM-2 Blk IVA in EMD missile delivery in FY00 • DT/OT FY99-01	4, 7	Navy	47.300 – *	204221N 204228N
Passive Defense • Navy RADIAC Program	• RDT&E and procurement of radiation detection and monitoring equipment for a variety of applications	• Underwater RADIAC prototypes delivered • Production of Multifunction RADIAC • Continuation of LHTLD LRIP	• Achieve MSIII for Multi-function RADIAC/LHTLD	9	Navy	3.600 4.035	603542N 82M2
Counter Paramil./ Terrorist Threats • Joint Service EOD Systems Program	• Specialized EOD equipment to locate, access, and render safe explosive devices, including NBC devices, for all Services	• Initial development of "main charge disrupter" and lightweight charge disrupter to neutralize explosive devices • Continued development of an improved ordnance locator system	• Initiate production for the Advanced Radiographic System FY98 • EMD for charge disrupters • Continue RONS projects	5	Navy	5.505	603654N
• USMC CBIRF	• USMC unit dedicated to managing the consequences of incidents involving CW/BW release	• Stood up Rapid Reaction Force • Participated in two phases of 911-Bio ACTD	• Continue equipment and procedural training • Purchase BW detection equipment	6	USMC	9.000 10.000 1.277	O&M Procurement 605873M

*Allocation of funding between SM-2 Block IV and IVA missiles has yet to be determined.

Table C.4: Key U.S. Navy Programs Strongly Related to Counterproliferation (continued)

Program/Project Title	Project Description	Project Accomplishments	Key Milestones	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
• Joint Service EOD Procedures Program	• Tests and validates prototype EOD systems and develops specialized procedures for EOD units • Funds DTRG technical support unit	• Maintained DTRG readiness • Developed countermeasure procedures for improvised nuclear devices • Continued development of EOD procedures for foreign and U.S. ordnance	• Continue render safe procedures development for U.S. and foreign ordnance and improvised nuclear devices • Continue DTRG support	5, 6	Navy	5.251	603654N
					• Total:	106.939	

Table C.5: Key U.S. Air Force Programs Strongly Related to Counterproliferation

Program/Project Title	Project Description	Project Accomplishments	Key Milestones	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
Proliferation Prevention • Nuclear Detonation Detection System (NDS)	• Integrates and supports nuclear detonation sensors on GPS satellites • Develops and procures ground system for nuclear detonation reporting	• Integrated new sensors on GPS Block IIR satellites • Developed and tested ground segment processing and display system hardware and software	• GPS Block IIA/IIR launches 4QFY98 • ICADS Build 4 delivery FY98; Build 5 design review FY99 • Ground NDS Terminal Phase 2 delivery 4QFY98	15	Air Force	23.400	305913F O&M
Strategic/Tactical Intelligence • HAARP Project Support	• Exploratory hardware development and operational support	• Program supplemented by Counter-proliferation Support Program	• See Table C.1	3, 8	Air Force	0*	602601F
• LIDAR Remote Optical Sensing Technology Program	• Developing LIDAR technologies used for standoff detection and BDA surveillance of NBC/M production, storage, and use	• Demonstrated 20 km detection range	• Flight testing to validate 20 km detection range	8, 1	Air Force DIA	1.502	602601F
Counterforce • Hard and Deeply Buried Target Defeat Capability: Hard Target Munitions Dem/Val	• Joint Service evaluation and development of hard and deeply buried target defeat capabilities (see also Tables C.4 and C.8)	• Baseline concepts collected and analyzed assessment of alternatives Phase I • ACTD working group formed	• Milestone I approval 1QFY99 • Transition to EMD 3QFY02 • Production and initial fielding 4QFY05	3, 2, 5, 8, 11	Services DSWA OSD DIA	9.803	604327F
• CALCM (Block II)	• Long range standoff precision hard target penetrator munition	• classified	• Block II production starting FY00	2, 3	Air Force	classified	207323F
• Agent Defeat Weapon Program	• Develop capabilities to destroy, neutralize, immobilize, or deny an adversary access to BW/CW agents with little or no collateral damage	• Baseline evaluation of agent defeat concepts completed • Construction and preliminary validation of agent release, dispersion, and venting models • Completed empirical lethality model	• Milestone I approval 4QFY99 • Transition to EMD 4QFY03 • Production and initial fielding 4QFY06	2, 4, 12, 11	Air Force DOE	0.298	604222F
Active Defense • SBIRS High/Low	• Supports the mission areas of Theater and National Missile Defense by providing data on missile launches against the U.S., its deployed forces, and allies • Supports the mission area of technical intelligence by gathering data on all missile and space launches and tests world-wide	• High component program design review	• Increment 1 IOC 4QFY99 • SBIRS GEO/LEO launch FY02/04	4, 8	Air Force	732.000	603441F 604441F 604442F

* Currently, no FY 1999 funds are requested for this Congressional Special Interest Program.

Table C.5: Key U.S. Air Force Programs Strongly Related to Counterproliferation (continued)

Program/Project Title	Project Description	Project Accomplishments	Key Milestones	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
• Airborne Laser (ABL) Program	• Provides the DoD with its only boost phase intercept capability against theater ballistic missiles • Integrates state-of-the-art multi-megawatt chemical laser, optical beam control and fire control system, and related BMC4I systems onto a commercial 747-400F aircraft • Provides TBM cueing data to terminal defense and attack operations systems • Improving overall Family of Systems engagement capability and lethality	• Completed PDRR Program Requirements Review in Apr 97 • Successful mini flight-weighted laser module demo in Aug 97 • Completed 3 seasonal atmospheric turbulence data collection campaigns • Started fabrication of first laser module	• PDRR system PDR and flight-weighted laser module demo FY98 • PDRR CDR FY99 • 747-400F (unmodified) aircraft delivered FY00 • Conduct intercept demo FY02 • Complete Program Definition and Risk Reduction and transition to EMD FY03 • 3 aircraft IOC FY06 • Full operational capability (7 aircraft) FY08	4, 7	Air Force	292.219	603319F
• Theater Missile Defense R&D Program	• R&D integration to improve BMC4I and attack operations capabilities and their supporting infrastructure elements	• Demonstration of Link-16 range extension and integration of theater missile defense message set on AWACS • Development of IPB methodology and automated application tools; completion of country studies • Completion of the Defensive Planning Module and the Time Critical Targeting Aid; expert missile tracker prototype • ATR/ATC TESSA radar upgrade to F-15E radar Ground Moving Target Tracker and enhanced Synthetic Aperture Radar resolution	• Demonstrate improved JSTARS ATR and Moving Target Indication capability • Demonstrate theater missile defense Smart Sensor/ ATR with LANTIRN pod upgrade • Continue TESSA LANTIRN pod upgrade (3rd generation FLIR) and ATR	4, 7, 12	Air Force	31.057	208060F
Counter Paramil/ Terrorist Threats							
• Air Force Antiterrorism Specialty Team	• Specialized team to support force protection needs of Air Force commanders worldwide	• New Initiative	• Support force protection needs of Air Force commanders worldwide	5	Air Force OSI	.312	208047F
• Air Force Force Protection Battlelab	• Explore and integrate technology, tactics, and training to increase force protection readiness	• New Initiative	• Integrate technology, tactics, and training to increase force protection readiness	5	Air Force	4.702	208047F
				• Total:		1,095.293	

Table C.6: Key BMDO Programs Strongly Related to Counterproliferation

Program/Project Title	Project Description	Project Accomplishments	Key Milestones	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
Active Defense • PATRIOT PAC-3 – EMD	• The PATRIOT Advanced Capability Level 3 (PAC-3) upgrade program is the latest evolution of a phased material improvement program for PATRIOT	• First flight test of the PAC-3 missile	• First intercept test planned for FY98 • LRIP decision due in FY98 • FUE 4QFY99 • MS III for full rate production in FY99	4, 7	BMDO	137.265	604865C
• PATRIOT PAC-3 Procurement	• Purchase/upgrade missiles, launchers, radars, communications relay group • JTIDS and modification kits to equip 7-10 battalions	• Previously reported under an Army funding line	• Complete flight test series • Achieve scheduled production quantities • Retrofit battalion equipment to latest version	4,7	BMDO	343.235	208865C
• Navy Area TBMD System – EMD	• Modification of Navy Standard Missile and AEGIS combat system (ACS) to enable endoatmospheric theater ballistic missile engagement	• Conducted Milestone II DAB review • Missile CDR conducted FY97 • Conducted risk reduction flight tests and successful target kill • EMD contract let to build SM-2 Block IVA missiles for developmental testing	• DT/OT FY00-01 • Ship-deployed UOES FY00 • MS III decision in FY01 • FUE FY02	4, 7	BMDO	245.796	604867C
• Navy Area TBMD Procurement	• Funds provide for procurement of SM-2 Blk IVA missiles	• Previously reported under a Navy funding line	• SM-2 Blk IVA in EMD missile delivery in FY00 • DT/OT FY99-01	4	BMDO	43.318	208867C
• THAAD System – PD/RR and EMD	• Development of land-based, long-range, high-altitude TBMD intercept system to protect broad areas • BM/C3I architecture that allows interoperability with existing and future air defense systems	• QDR endorsed restructure of program; more flight tests added for risk mitigation	• Complete successful intercept tests • MS II DAB review scheduled for FY99 • UOES FY01 • LRIP review FY04 • FUE in FY06	4	BMDO	497.752 323.942	603861C 604861C
• Navy Theater-Wide TBMD System	• Development of ship-based, theater-wide defense system based on leveraging the Navy Area TBMD program and further modifying the AEGIS, Standard Missile, and Vertical Launch System	• Declared a Major Defense Acquisition Program • Congressional plus-up allowed for additional AEGIS LEAP Intercept (ALI) flight tests and expanded risk reduction activities	• Conduct ALI control and guidance flight tests • DAB review scheduled for FY98; MS II DAB in FY03 • Initial ALI intercept FY99 • FUE scheduled for FY06	4	BMDO	190.446	603868C

Table C.6: Key BMDO Programs Strongly Related to Counterproliferation (continued)

Program/Project Title	Project Description	Project Accomplishments	Key Milestones	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
• MEADS	• Definition and validation of a short range theater missile defense and advanced air defense system to protect maneuvering forces	• Completed MoU with Germany and Italy for project definition/validation • Established National Project Office and NATO MEADS Management Agency • Commenced project definition/ validation phase with 2 international industry teams	• Conduct system requirements and design reviews • Downselect to a sole contractor to conduct design, and development, and production	4, 7	BMDO	43.027	603869C
• National Missile Defense (NMD)	• System development, test, and deployment planning for NMD • Long-lead planning and designs for key operational facilities for the NMD 3+3 deployment readiness program	• QDR reaffirmed commitment to NMD and the "3+3" acquisition strategy • USD(A&T) approved acquisition strategy and release of LSI execution phase RFP • Program received plus-up of Congressional funding	• Down select to a single lead system integrator during FY98 • Integrated systems test FY99 • Deployment readiness review in FY00	4	BMDO	950.473 12.230	603871C MILCON
• International Cooperative Programs	• New program element to support the technical and analytical cooperative efforts between the United States and other nations.	• Includes Russian-American cooperative programs of observer satellites (RAMOS) and upper atmosphere joint research (APEX) • Includes Israeli cooperative projects, such as the Arrow Deployability Project.	• PDR for RAMOS in FY99 • APEX to be launched from Poker Flats in FY99 • Continued testing of Arrow system with U.S. benefit review in FY99	4	BMDO	50.676	603875C
					• Totals:	2,838.160	

Table C.6 covers only RDT&E and procurement funds associated with BMDO's core programs; it does not include other basic research and integration programs that have general application. The total BMDO budget request for FY 1999 is $3.6 billion.

Table C.7: Key DARPA Programs Strongly Related to Counterproliferation

Program/Project Title	Project Description	Project Accomplishments	Key Milestones	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
Counterforce/Battlefield Surveillance • Surveillance Sensor and Exploitation Systems Program	• Develop sensors to defeat camouflage, concealment, and deception practices, including foliage penetrating radars • Provide near real-time, semi-automated exploitation of wide area imagery to track critical mobile targets	• Awarded competitive procurement for FOPEN demonstrator • Multisensor Exploitation Testbed Architecture Review Completed • Participation in Roving Sands '97 exercise • Successful automatic production of radar images of moving targets	• Develop and demonstrate FOPEN radar and conduct CDR FY98 • Demonstrate automatic target cueing, vehicle classification, and false alarm mitigation techniques • Demonstrate next generation ATR	12, 8, 11, 2, 3	DARPA	47.400	603762E
• Information Integration Systems Program	• Development of an integrated, all-source, geographically referenced battlefield knowledge base and information distribution system for enhanced, real-time situation assessment and intelligence dissemination	• Integrated eight existing fusion engines • Demonstrated functionality of the global broadcast service and information servers for rapid disseminated of imagery products • Bidders brief for Dynamic Database completed, source selection in process	• Demonstrate multi-intelligence correlators; warfighter's associate for direct broadcast of and flexible access to large data and product servers; and enhanced automated information management capabilities • Implement flexible information fusion architecture for joint inter-operability across operations and systems	12, 8, 11	DARPA	77.900	603760E
Passive Defense • BW Defense Sensors Program	• Research, develop, and demonstrate technologies that will minimize impact of BW agents on future military operations	• Initiated biochip development to identify bacillus genus and species • Demonstrated use of red blood cells to eliminate pathogens from circulation and the programming of stem cells to produce and release therapeutic products to detect specific pathogens	• Develop advanced miniaturized point detectors for BW agents • Extend consequence management software to BW defense • Develop BW medical countermeasures emphasizing multi-agent approaches	1, 9, 6	DARPA	15.000	602383E
• BW Defense Unconventional Pathogens and Advanced Diagnostics Program	• Develop new medical countermeasures, diagnostics, and consequence management tools	• New initiative	• Detect presence of BW infection • Differentiate between pathogens in absence of symptoms • Improved situational awareness to protect and treat combatants	1, 6, 9	DARPA	73.000	602383E
					• Totals:	213.300	

Table C.8: Key DSWA Programs Strongly Related to Counterproliferation

Program/Project Title	Project Description	Project Accomplishments	Key Milestones	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
Proliferation Prevention • Nuclear Arms Control/CTBT Verification Technology Program	• RDT&E of technologies to support CTBT implementation, compliance, and verification • Provide enhanced nuclear safeguards	• Consolidated funding of R&D programs under DSWA • Continued development of global continuous threshold monitoring network and data fusion knowledge base	• All U.S. IMS monitoring stations operational FY99 • Deliver IDC to CTBT international organization FY99 • IMS and IDC operational FY00	15	DSWA	35.300 1.900	603711BR O&M
• DSWA Chemical/ Biological Arms Control Technology Program (CB ACT)	• Implementation, verification, monitoring, and inspection of CW/BW arms control agreements • Development of technologies and procedures to support CW/BW-related arms control negotiations	• Developed an enhanced Swept Frequency Acoustic Interferometry prototype to classify munitions compounds, an improved decision algorithm for Acoustic Resonance Spectroscopy, a super critical fluid extractor for sample preparation, and a U.S./Finnish method for sample collection and analysis	• Develop data management system, system software documentation, and independent verification and validation for BWC FY99-02 • Complete BW history document (part 2) FY99 • Continue the Agent of Biological Origin reference handbook • Develop blinded quality assurance/control module for analytical data software	15	DSWA	10.542	603711BR
• DSWA Strategic Arms Control Technology Program	• RDT&E of technologies to enable verification of START I, START II, and follow-on nuclear weapons treaties	• Developed the authenticated Tracking and Monitoring System • Incorporated START II data requirements into the START Central Data System • Field tested the Arms Control Verification Gravity Gradiometer	• Develop object and pattern recognition video FY98 • Demonstrate new tagging technologies FY99 • Develop nuclear weapon identification detectors FY02	15, 13	DSWA	9.378	603711BR
Counterforce • Hard Target Defeat Program	• End-to-end evaluation and development of improved tactics and technologies for hard target characterization and defeat	• Completed initial tunnel portal attack assessments • Completed tunnel MEA ver 1.0 • Initiated joint DSWA/DIA Tunnel Defeat Demonstration Program	• Release MEA for tunnels ver 2.0 FY99 • Conduct tunnel characterization and attack field tests FY98-03 • Deliver initial deliberate planning tool FY00	3, 2, 11	DSWA	10.780	602715BR

Table C.8: Key DSWA Programs Strongly Related to Counterproliferation (continued)

Program/Project Title	Project Description	Project Accomplishments	Key Milestones	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
• Weapons Systems Lethality Program	• Evaluation of conventional weapon lethality and effects and collateral effects assessment • Maintain core competency in nuclear weapons effects	• Developed/validated models for combined weapons effects in support of the CP1 ACTD • Provided hazard assessment support to contingency operations	• Update weapons lethality and collateral effects tools based on CP2 ACTD results FY99 • Integrate predictive tools into warfighter systems FY00 • Assess urban nuclear terrorism and covert ship delivery threats FY01	11, 2, 3, 5	DSWA	48.940	602715BR
Passive Defense • Test and Simulation Technology	• Simulator operations and technology development to validate weapon system survivability and operability	• Non-Ideal Air Blast tests of M113 on LB/TS • Successful demonstration of DECADE technology • THAAD sensor testing using infrared clutter simulator • Consolidated radiation test facilities	• BMEWS test FY98 • Complete 512x512 NODDS scene generator FY98 • DECADE hot x-ray IOC FY99 • DECADE cold x-ray IOC FY00 • Advanced DECADE hot x-ray capability IOC FY02	9	DSWA	33.283	602715BR
• Weapon System Operability Program	• Force survivability assessments against nuclear weapons effects based on test results	• Completed STRATCOM operability assessments • Initiated TW/AA transition operability assessment • Completed development of rad hard SOI 1 megabyte SRAM and initiated development of 0.35 micron SOI technology • Completed HEMP tests of C4I vans	• Complete initial USSPACECOM TW/AA transition assessment for space and ground segments FY98 • Assess nuclear operability of NORAD/USSPACECOM warfighter support system FY99 • Develop submicron (0.35 micron) radiation-hardened electronics	9, 11, 4, 7	DSWA	7.200	602715BR
Counter Paramil/ Terrorist Threats • Force Protection Initiative	• Conduct force protection assessments, field assessment teams to identify and evaluate shortfalls, and develop an R&D support plan	• Developed CONOPS and assessment method • Fielded five assessment teams • Completed 50 assessments in 1997 • Conducted symposium to seek inputs from industry	• Conduct 100 assessments per year • Define a prioritized technology R&D plan to address key force protection shortfalls	5	DSWA	4.400	O&M
				• Totals:		161.723	

Table C.9: Key OSD Programs Strongly Related to Counterproliferation

Program/Project Title	Project Description	Project Accomplishments	Key Milestones	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
Proliferation Prevention							
• Critical Technology Support Program	• Preparation of the *Militarily Critical Technologies List* (MCTL) to support export control activities • Identify and assess technologies that could assist in countering the proliferation of NBC/M	• Published MCTL Part II, *Weapons of Mass Destruction Technologies* • Provided technical support to DoD and interagency processes in Wassenaar Arrangement and other NBC/M constraint arrangements	• Monitor and update MCTL regularly	14	DUSD (ICP)	2.618	605110T
Counter Paramil/ Terrorist Threats							
• National Guard/ Reserve Component RAID Teams	• Provide augmentation forces to civil authorities through expanded National Guard and Reserve Component assets to respond to NBC events	• New initiative	• Activate ten RAID Teams, one per FEMA region • Establish NBC reconnaissance and patient decontamination teams • Establish program office	6	Army	49.2	Procurement O&M
• Domestic Preparedness Initiative	• Improve NBC emergency response preparedness and coordination with state and local agencies through First Responder training, interagency exercises, and technical assistance	• Trained over 3,000 local officials and first responders • Activated emergency and non-emergency help lines • Shipped training equipment to local officials in 8 metropolitan areas	• Continue first responder training • Conduct preparedness exercises with federal, state, and local agencies	6	ASD (SO/LIC) Army	49.900	O&M
• Counterterror Technical Support Program	• Develop technical capabilities and prototype systems and concepts to detect, render safe, and defend against paramilitary and terrorist NBC threats	• Deployed large-vehicle-bomb countermeasures devices • Fabricated four prototype CBSS • Delivered SOF CAD prototypes • Tested and evaluated the Escape Hood • Field tested the Biological Detection Kit during 911-Bio ACTD	• Complete development of field-portable x-ray system for large volume explosives detection and low-cost disposable protective CW/BW mask	5	ASD (SO/LIC)	30.495	603122D
• Joint Physical Security Equipment	• Consolidates DoD activities for facility and nuclear and other high value weapons protection equipment	• Demonstrated force protection equipment to government users • Completed phases I and II of Waterside Security System ATD • Completed testing of shipboard security packages	• MDARS exterior MS II FY99; interior MS III FY00 • Advanced exterior sensor MS II FY00	5	USD (A&T/S&TS)	31.792	603228D
• SO/LIC Analytical Support	• Research/analysis of technical, acquisition, and policy issues relating to special operations, counterterrorism, and unconventional warfare	• Supported DoD World-Wide Anti-terrorism Conference and the International Terrorism Response Awareness Program	• Continue support for ASD(SO/LIC) activities and programs	5	ASD (SO/LIC)	1.335	603122D

Table C.9: Key OSD Programs Strongly Related to Counterproliferation (continued)

Program/Project Title	Project Description	Project Accomplishments	Key Milestones	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
• Explosive Ordnance Disposal/ Low-Intensity Conflict Program	• Rapid prototyping effort to provide technology, equipment, command and control, detection, countermeasures, and neutralization of explosive devices	• Successful demonstration of EOD technology in Kuwait, Somalia, Bahrain, and Bosnia • Continued development of an autonomous vehicle to detect and dispose of explosive devices • Completed development of Autonomous Search System, Explosive Kit Ready Storage Unit, Standoff Dearmer, non-explosive cartridges, Improvised Explosive Device visualization tool, and Limpet mine detection system	• Enhanced real-time radiography systems to be fielded FY99 • Advanced Radiographic System IOC FY00	5	ASD (SO/LIC)	3.983	603122D8Z
• Joint Robotics Program	• Consolidates Service/DoD RDT&E efforts to demonstrate mature robotics technologies for EOD and other activities	• Tactical user appraisals conducted using robotic equipment • Completed 4 TUV field training exercises • Delivered 4 Reconnaissance Ground Equipment systems for user appraisal	• Complete TUV user appraisal • Integrate autonomous control functions for surface range ordnance clearance system	5	USD (A&T/S&TS)	5.385	603709D
					• Totals:	174.708	

Table C.10: Key CTR Programs Strongly Related to Counterproliferation

Program/Project Title	Project Description	Project Accomplishments	Key Milestones	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
Proliferation Prevention • Destruction and Dismantlement	• Assistance to FSU in the destruction and dismantlement of nuclear weapons, strategic delivery systems, and chemical munitions.	• All nuclear warheads removed from Ukraine, Belarus, and Kazakhstan • 255 ICBMs dismantled • 252 ICBM silos destroyed • 84 SLBM launchers eliminated • 37 heavy bombers dismantled • Sealed 117 of 194 nuclear weapons test tunnels and bore holes at Kazakhstan's Degelen Mountain complex	• Complete Central Chemical Analytical Lab FY99 • Seal 194 nuclear test tunnels and bore holes FY99 • Eliminate 497 ICBMs FY02 • Eliminate 548 SLBM launchers FY02	15	ATSD (NCB)	278.300	FSU Threat Reduction
• Chain of Custody Programs	• Design and manufacture of fissile material containers, support for a Russian fissile material storage facility, and improvement of weapons security in the FSU	• Delivered all 150 Supercontainers for safeguarding nuclear weapons during transportation • Produced 50 km of perimeter fencing and sensors to enhance storage site security • Delivered three mobile chemical analytical labs in support of CW destruction • Continued construction of Mayak Fissile Material Storage Facility; delivered over 20,000 fissile material containers • Continued design and testing of Russian Reactor Core Conversion project	• Deliver 24,000 fissile material containers FY98 • Complete conversion of weapons grade plutonium producing reactor FY99 • Complete Mayak Fissile Material Storage Facility FY00	15, 13	ATSD (NCB)	152.100	FSU Threat Reduction
• Demilitarization	• Support for conversion of defense related industry and demilitarization of the nuclear weapons industry through elimination of physical infrastructure	• Established 17 joint venture partnerships between U.S. companies and FSU defense enterprises formerly associated with NBC/M production • Over 15,000 former Soviet weapons scientists and engineers now employed on peaceful civilian projects • Defense Enterprise Fund established	• Defense Enterprise Fund becomes self-sufficient and continues to support conversion of defense enterprises	15	ATSD (NCB)	2.000	FSU Threat Reduction
• Other Program Support	• Conduct training and exchange projects in the FSU to increase expertise in demilitarization • Administrative and logistical support to other CTR areas	• Funded 117 exchanges between U.S. and FSU defense establishments • Conducted 44 audits and examinations of CTR program	• Support Joint Staff activities	15	ATSD (NCB)	10.000	FSU Threat Reduction
				• Totals:		442.400	

Table C.11: Key OSIA Programs Strongly Related to Counterproliferation

Program/Project Title	Project Description	Project Accomplishments	Key Milestones	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
Proliferation Prevention							
• Comprehensive Test Ban Treaty	• Proposed escort, security, and training functions for DoD/U.S. personnel and facilities	• Provided technical advisory support to the CTBT Interagency Backstopping Group and CTBT Verification Monitoring Task Force	• Treaty entry-into-force	15	OSIA	1.660	O&M
• INF Treaty	• Inspections and inspection supporting under the terms of the INF Treaty	• Treaty year 10 inspections ongoing	• Continuation of treaty-related inspections	15	OSIA	11.907	O&M
• START I Treaty	• Inspections and inspection support under the terms of START I	• Baseline and treaty year 3 inspections completed successfully	• Continuation of treaty year 4 inspections	15	OSIA	16.703	O&M
• START II Treaty	• Planning and preparations for verification of START II	• Senate gave advice and consent to ratify treaty in January 1996	• Awaiting ratification of the treaty by the Russian Duma	15	OSIA	6.438	O&M
• Nuclear Testing Treaties	• Monitoring and monitoring support of Threshold Test Ban Treaty and Peaceful Nuclear Explosions Treaty	• Maintained a lower state of readiness to deploy and monitor Russian nuclear test	• OSIA/DOE standdown of TTBT monitoring equipment	15	OSIA	0.064	O&M
• CW Agreements	• Inspections and inspection support under the terms of CWC and Bilateral Destruction Agreement for verification and destruction of CW	• Supported 33 inspections and continuous monitoring of U.S. facilities • Continued mock inspections and training exercises in CONUS and OCONUS • CWC entry-into-force, April 1997	• Bilateral Destruction Agreement entry-into-force not earlier than 1999	15	OSIA	34.467	O&M Procurement MILCON
• BW Agreements	• Inspection support under the terms of BWC and BW Trilateral Agreement	• Conducted staff assistance visits and mock inspections in CONUS	• Continue support to BW agreement preparations	15	OSIA	0.130	O&M
• Plutonium Production Reactor Agreement	• Cessation of production of weapons-grade plutonium by Russia and U.S.	• Supported Joint Implementation Compliance Committee (JICC) • Conducted joint expert visits to U.S. and Russian nuclear sites	• Conduct JICC meeting, Summer 1998	15	OSIA	0.580	O&M
• Other programs: UNSCOM Operations in Iraq	• As executive agent for DoD, provides personnel, services, and equipment in support of UNSCOM	• Provided support in enforcing UN Security Council Resolution 687 directing the destruction of Iraq's WMD infrastructure	• Continued support to UNSCOM monitoring of Iraq's compliance with UN resolutions	15	OSIA	5.515	O&M
• DoD/FBI Counter-proliferation Program	• Prevent the proliferation of NBC/M and related material in the FSU, Baltic States, and Eastern Europe	• Conducted training sessions for Kazakhstan, Kyrgyzstan, and Uzbekistan • Conducted legal seminars for Kazakhstan and Uzbekistan	• Continue to conduct training sessions and legal seminars	13, 14	OSIA	1.767	O&M
• DoD/USCS Counter-proliferation Program	• Prevent the smuggling and transit of NBC/M and related material in the FSU, Baltic States, and Eastern Europe	• Country assessment visits to Bulgaria, Romania, Slovenia, and Georgia • Radiation Academy training for Hungary and Slovakia	• Radiation Academy training for Bulgaria at HAMMER facility	13, 14	OSIA	2.720	O&M
				• Totals:		81.951	

Table C.12: Key DTSA Activities Strongly Related to Counterproliferation

Activity	Description	Accomplishments	Key Milestones	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
Proliferation Prevention • DTSA Activities	• Develops and implements DoD policies regarding military and dual-use exports and coordinates DoD's review of export licenses	• Enhancement of the Wassenaar Arrangement multinational export control framework • Reviewed over 21,000 export license applications for military and dual-use technologies • Conducted export control cooperation programs with other nations	• Continue to monitor and update export control regulations • Continue export license reviews • Continue international cooperation activities	14	DTSA	10.560*	O&M
				• Totals:		10.560	

* FY 1999 budget may change when DTRA becomes operational in October 1998

Table C.13: Key Joint Staff Programs Strongly Related to Counterproliferation

Program/Project Title	Project Description	Project Accomplishments	Key Milestones	DoD ACE	Agency	FY 99 Budget [$M]	PE No.
Active Defense • JTAMDO Support	• Planning, coordination, and oversight of Joint integrated theater air and missile defense requirements generation, Joint operational concepts, and architecture development • Modeling and simulation and studies and analysis support	• Developed Joint Theater and Air Missile Defense Master Plan	• Maintain requirements section of Master Plan for fielding integrated theater air and missile defenses • Coordinate and support Services, CINCs, and DoD Agencies in interoperability assessments and initiatives	4, 7	Joint Staff	17.423	605126J
Counter Paramil./ Terrorist Threats • CJCS Combating Terrorism Readiness Initiatives Fund	• Funds available to CINCs for emergency or other unforeseen, high-priority combating terrorism needs	• New Initiative	• Provide funds to CINCs as needed	5	Joint Staff	15.000	208047J
				• Totals:		32.423	

APPENDIX D

Planned FY 1999 Budget Profile for DOE Programs Related to Countering Proliferation

The planned FY 1999 funding profiles for DOE nonproliferation programs related to countering proliferation and NBC terrorism and addressing the counterproliferation ACEs are provided in Table D.1 below.

Table D.1

Planned FY 1999 Budget Profile for DOE Programs Related to Countering Proliferation

DOE Activity Area	DOE ACE Priority	FY 1999 Budget [$M]
• Detecting and Characterizing Worldwide Production of Nuclear Materials and Weapons	1	66.3
• Monitoring Worldwide Nuclear Testing	5	81.2
• Preventing and Detecting the Diversion and Smuggling of Nuclear Materials	1, 7	43.5
• Chemical and Biological Nonproliferation Program	3	19.0
• Securing Nuclear Materials, Technology, and Expertise in Russia, FSU States, and the Baltics	1	187.8
• Limiting Weapons-Usable Fissile Materials Worldwide	1	10.6
• Ensuring Transparent and Irreversible Reductions in Global Nuclear Stockpiles	1	11.1
• Strengthening the Nuclear NPT Regime	5	38.2
• Controlling Nuclear Exports	9	9.2
• Nuclear Emergency and Terrorism Response	2, 4	48.3
	• Total:	**$515.2**

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APPENDIX E

Counterproliferation-Related Worldwide Web Sites

A list of selected locations on the World Wide Web that provide information about NBC weapons, proliferation, and terrorism is contained in this appendix. This list is not intended to be exhaustive, but rather to aid those in the research and analysis of issues associated with countering NBC/M proliferation and NBC terrorism. Identification of a site listed here does not represent an endorsement by the CPRC nor any of its represented organizations, nor any responsibility for the content or accuracy of information provided at each site. Site locations (URLs) may change or be deleted, but were accessible as of May 1, 1998.

U.S. Government Web Sites

National Security Council
www.whitehouse.gov/WH/EOP/NSC/html/nschome.html

Central Intelligence Agency
www.odci.gov/cia/index.html

Department of Defense
www.defenselink.mil

Ballistic Missile Defense Organization
www.acq.osd.mil/bmdo/bmdolink/html/bmdolink.html

CBIAC (Chemical Warfare/Chemical Biological Defense (CW/CBD) Information Analysis Center)
www.cbiac.apgea.army.mil

Cooperative Threat Reduction Program
www.ctr.osd.mil

Counterproliferation and Chemical/Biological Defense Network
www.acq.osd.mil/cp
Home page of the Deputy Assistant to the Secretary of Defense for Counterproliferation and Chemical/Biological Defense.

Defense Advanced Research Projects Agency
www.darpa.mil

Defense Special Weapons Agency
www.dswa.mil

Defense Technology Security Administration
www.dtsa.osd.mil/index.html

Joint Chiefs of Staff
www.dtic.mil/jcs

Militarily Critical Technologies List
www.dtic.mil/mctl

On-Site Inspection Agency
www.osia.mil

U.S. Army Chemical and Biological Defense Command
www.cbdcom.apgea.army.mil

U.S. Army
www.army.mil

U.S. Navy
www.navy.mil

U.S. Air Force
www.af.mil

U.S. Marines Corps
www.usmc.mil

Department of State
www.state.gov

Arms Control and Disarmament Agency
www.acda.gov

Department of Energy
www.doe.gov

Comprehensive Test Ban Treaty Research & Development
www.ctbt.rnd.doe.gov/ctbt

Material Protection, Control, & Accounting Program
www.dp.doe.gov/nn/mpca/index.html

Office of Nonproliferation and National Security
www.nn.doe.gov

Argonne National Laboratory
www.anl.gov

Lawrence Livermore National Laboratory
www.llnl.gov

Los Alamos National Laboratory
www.lanl.gov

Oak Ridge National Laboratory
www.ornl.gov

Sandia National Laboratory
www.sandia.gov

General Accounting Office
www.gao.gov

U.S. Senate Armed Services Committee
www.senate.gov/~armed_services

U.S. House National Security Committee
www.house.gov/nsc

U.S. Government Reports On-Line

Joint Warfighting Science and Technology Plan
www.dtic.mil:80/dstp/index.html
This document describes Joint Service efforts to research and develop advanced weapons and defensive systems using the latest technology.

The Proliferation Primer
www.senate.gov/~gov_affairs/ispfs.htm
A Majority Report of the Subcommittee on International Security, Proliferation, and Federal Services, Committee on Governmental Affairs, United States Senate.

Proliferation: Threat and Response, November 1997
www.defenselink.mil/pubs/prolif/index.html
This document, issued by the Office of the Secretary of Defense, reports on the military threat posed by the proliferation of nuclear, chemical, and biological weapons and their delivery systems.

Report on Activities and Programs for Countering Proliferation and NBC Terrorism **and** ***DoD NBC Defense Annual Report to Congress*** **(multiple years)**
www.acq.osd.mil/cp

Report of the Quadrennial Defense Review, May 1997
www.defenselink.mil/pubs/qdr

Non-U.S. Government Web Sites

Centre for Defence and International Security Studies (CDISS)
www.cdiss.org
CDISS is based at Lancaster University, United Kingdom, and provides information and analysis on ballistic and cruise missile proliferation, as well as nuclear, biological, chemical, and radiological weapons proliferation.

Center for Nonproliferation Studies (CNS)
cns.miis.edu
CNS is based at the Monterey Institute of International Studies and is a non-governmental organization focused on the issue of proliferation of weapons of mass destruction. The site includes a "Guide to Chemical and Biological Weapons Websites."

Center for Security Policy (CSP)
www.security-policy.org
Based in Washington, DC, CSP provides analysis on a range of national security and defense issues, including chemical and biological weapons and missile defense.

Center for Strategic and International Studies (CSIS)
www.csis.org
Based in Washington, DC, CSIS is a public policy research institution.

Heritage Foundation – National Security Section
www.nationalsecurity.org
Based in Washington, DC, the Heritage Foundation is a non-profit public policy research organization.

NBC Industry Group
www.erols.com/nbcgroup
Home page of the NBC Industry Group, an association of organizations supporting NBC defense, domestic preparedness, and the Chemical Weapons Convention.

United Nations Special Commission (UNSCOM)
www.un.org/depts/unscom/index.html
Home page of the UNSCOM describing its inspection and destruction activities of Iraq's chemical, biological, and missile capabilities, as well as its other related activities and responsibilities.

APPENDIX F
List of Acronyms and Abbreviations

ABL	Airborne Laser
ABM	Anti-Ballistic Missile (Treaty)
A/C	Aircraft
ACADA	Automatic Chemical Agent Alarm
ACDA	U.S. Arms Control and Disarmament Agency
ACE(s)	Area(s) for Capability Enhancements
ACPM	Aircrew Protective Mask
ACQWeb	DoD's Acquisition and Technology Worldwide Web Site
ACTD	Advanced Concept Technology Demonstration
AEGIS	Navy shipboard air defense system
AERP	Aircrew Eye/Respiratory Protection
AICPS	Advanced Integrated Collective Protection System
AOR	Area of Responsibility
ASD	Assistant Secretary of Defense
ASD(C3I)	Assistant Secretary of Defense (Command, Control, Communications, and Intelligence)
ASD(S&TR)	Assistant Secretary of Defense (Strategy and Threat Reduction)
ASD(SO/LIC)	Assistant Secretary of Defense (Special Operations/Low-Intensity Conflict)
ATC	Automatic Target Cueing
ATD	Advanced Technology Demonstration
ATR	Automatic Target Recognition
ATSD(NCB)	Assistant to the Secretary of Defense for Nuclear and Chemical and Biological Defense Programs
AUP	Advanced Unitary Penetrator
AWACS	Airborne Warning and Control System
BDA	Battle Damage Assessment
BIDS	Biological Integrated Detection System
Bio/BIO	Biological
Blk	Block (as in Block upgrade for a procurement item)
BM	Battle Management
BMC4I	Battle Management/Command, Control, Communications, Computers, and Intelligence
BMDO	Ballistic Missile Defense Organization
BMEWS	Ballistic Missile Early Warning System
BW	Biological Weapons
BWC	Biological Weapons Convention

CAD	Chemical Agent Detector
CALCM	Conventional Air-Launched Cruise Missile
CALIOPE	Chemical Analysis by Laser Interrogation of Proliferation Effluents
CB ACT	Chemical Biological Arms Control Technology
CBD	Chemical and Biological Defense
CBDCOM	Chemical and Biological Defense Command (Army)
CBDP	Chemical and Biological Defense Program
CBIRF	Chemical/Biological Incident Response Force
CBMS	Chemical/Biological Mass Spectrometer
CBNP	Chemical and Biological Nonproliferation Program (DOE)
CBPS	Chemical/Biological Protective Shelter
CBRS	Chemical Biological Respiratory System
CBSS	Chemical/Biological Sentry System
C2	Command and Control
C3	Command, Control, and Communications
C3I	Command, Control, Communications, and Intelligence
C4I	Command, Control, Communications, Computers, and Intelligence
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance
CDR	Critical Design Review
CE	Concept Exploration
CEC	Cooperative Engagement Capability
CENTCOM	U.S. Central Command
chem	Chemical
CIA	Central Intelligence Agency
CINC	Commander-in-Chief
CIPT	Counterproliferation Integrated Process Team (Air Force)
CJCS	Chairman of the Joint Chiefs of Staff
CMO	Central MASINT Office
CNS	Committee on National Security
CO_2	Carbon Dioxide
CONOPS	Concept of Operations
CONPLAN	Concept Plan
CONUS	Continental United States
CP	Counterproliferation
CP1 ACTD	ongoing Counterproliferation ACTD
CP2 ACTD	follow-on Counterproliferation Counterforce ACTD
CPRC	Counterproliferation Program Review Committee
CPSP	Counterproliferation Support Program
CRIPT	Critical Reagents Integrated Product Team
CRP	Critical Reagents Program
CTBT	Comprehensive Test Ban Treaty
CTR	Cooperative Threat Reduction
CTTS	Counterterror Technical Support
CW	Chemical Weapons
CWAR	Continuous Wave Acquisition Radar

CW/BW	Chemical and Biological Weapons
CWC	Chemical Weapons Convention
DAB	Defense Acquisition Board
DARPA	Defense Advanced Research Projects Agency
DATSD(NCB) (CP/CBD)	Deputy for Counterproliferation and Chemical/Biological Defense to the ATSD(NCB)
DATSD(NCB)(NTP)	Deputy for Nuclear Treaty Programs to the ATSD(NCB)
DCI	Director of Central Intelligence
Decon.	Decontamination
Demo.	Demonstration
Dem/Val	Demonstration and Validation
Devel.	Development
DGP	Defense Group on Proliferation (NATO)
DIA	Defense Intelligence Agency
DIAL	Differential Absorption Lidar
DNA	Deoxyribonucleic Acid
DoD	Department of Defense
DOE	Department of Energy
DOMS	Director of Military Support
DOS	Department of State
DPG	Dugway Proving Ground
DRI	Defense Reform Initiative
DS-2	Standard CW decontamination fluid
DSB	Defense Science Board
DSP	Defense Support Program
DSWA	Defense Special Weapons Agency
DT	Development Test
DT&E	Development, Test, and Evaluation
DT/OT	Development Test/Operational Test
DTRA	Defense Threat Reduction Agency
DTRG	Defense Technical Response Group (Navy)
DTSA	Defense Technology Security Administration
DUSD(AT)	Deputy Under Secretary of Defense (Advanced Technology)
DUSD(ICP)	Deputy Under Secretary of Defense (International and Commercial Programs)
EDT	Engineering Design Review and Test
EEE	Eastern Equine Encephalitis
EMD	Engineering and Manufacturing Development
EMP	Electromagnetic Pulse
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
EUCOM	U.S. European Command

FBI	Federal Bureau of Investigation
FDA	Food and Drug Administration
FEMA	Federal Emergency Management Agency
FLIR	Forward Looking Infrared
FOPEN	Foliage Penetration
FOWG	Fiber Optic Wave Guide
FOX	designator for the XM93 NBCRS armored vehicle
FSU	Former Soviet Union
FUE	First Unit Equipped
FY	Fiscal Year
FYDP	Future Years Defense Plan
GAN	Russian Federal Nuclear Radiation and Safety Authority
GBU	Guided Bomb Unit
GCC	Gulf Cooperation Council
GEM	Guidance Enhanced Missile
GEO	Geosynchronous Earth Orbit
GOSG	General Officer Steering Group
GPS	Global Positioning System
HAARP	High Altitude Auroral Research Project
HAMMER	Hazardous Material Management and Emergency Response
HASCAL	NBC hazard prediction code
HDBTDC	Hard and Deeply Buried Target Defeat Capability
HEMP	High-altitude Electromagnetic Pulse
HEO	Highly Elliptical Orbit
HEU	Highly Enriched Uranium
HHA	Hand-Held Assay
HPAC	Hazard Prediction and Analysis Code
HTSF	Hard Target Smart Fuze
IAEA	International Atomic Energy Agency
IBAD	Interim Biological Agent Detector
ICADS	Integrated Correlation Display System
ICAM	Improved Chemical Agent Monitor
ICBM	Intercontinental Ballistic Missile
IDC	International Data Center (CTBT)
IICT	Interagency Intelligence Committee on Terrorism
IMEA	Integrated Munitions Effectiveness Assessment
IMS	International Monitoring System (CTBT)
INF	Intermediate Range Nuclear Forces (Treaty)
Intell.	U.S. Intelligence
IOC	Initial Operating Capability

IOTE	Initial Operational Test and Evaluation
IPB	Intelligence Preparation of the Battlespace
IPDS	Improved (chemical agent) Point Detector System
IPP	Initiative for Proliferation Prevention
IPR	In-Process Review
IPT	Integrated Process (or Product) Team
IR	Infrared
IR-LIDAR	Infrared Light Detection and Ranging
IRTG	Integrated Regional Threat Group
ITAG	Inertial Terrain-Aided Guidance
J-2	Joint Staff designator for Intelligence
J-3	Joint Staff designator for Operations
J-5	Joint Staff designator for Plans and Policy
J-8	Joint Staff designator for Force Structure, Resources, and Assessments
JBPDS	Joint Biological Point Detection System
JBREWS	Joint Biological Remote Early Warning System
JCAD	Joint Chemical Agent Detector
JCS	Joint Chiefs of Staff
JMIP	Joint Military Intelligence Program
JPO-BD	Joint Program Office for Biological Defense
JROC	Joint Requirements Oversight Council
JSIVA	Joint Staff Integrated Vulnerability Assessment
JSLIST	Joint Services Lightweight Suit Technology
JSLSCAD	Joint Service Lightweight Standoff Chemical Agent Detector
JSTARS	Joint Surveillance Target Attack Radar System
JTAMDO	Joint Theater Air and Missile Defense Organization
JTIDS	Joint Tactical Information Distribution System
JVAP	Joint Vaccine Acquisition Program
JWARN	Joint Warning and Reporting Network
JWCA	Joint Warfighting Capabilities Assessment
JWCO	Joint Warfighting Capability Objectives
JWSTP	Joint Warfighting Science and Technology Plan
JSFXSD	Joint Service Fixed Site Decontamination
km	Kilometer
LANTIRN	Low Altitude Navigation and Targeting Infrared for Night
LB/TS	Large Blast/Thermal Simulator
LDS	Lightweight Decontamination System
LEAP	Lightweight Exoatmospheric Projectile
LEO	Low Earth Orbit
LHTLD	Laser Heated Thermoluminescent Dosimeter

LIC	Low-Intensity Conflict
LIDAR	Light Detection and Ranging
LLNL	Lawrence Livermore National Laboratory
LNBCRS	Lightweight Nuclear, Biological, and Chemical Reconnaissance System
LR-BSDS	Long Range Biological Standoff Detection System
LRIP	Low Rate Initial Production
LROS	LIDAR Remote Optical Sensing
LTBT	Limited Test Ban Treaty
MASINT	Measurement and Signature Intelligence
MCTL	*Militarily Critical Technologies List*
MDARS	Mobile Detection Assessment Response System
MDS	Modular Decontamination System
MEA	Munitions Effectiveness Assessment
MEADS	Medium Extended Air Defense System
MICAD	Multipurpose Integrated Chemical Agent Detector
MILCON	Military Construction
MINATOM	Ministry of Atomic Energy (Russia)
MoU	Memorandum of Understanding
MPC&A	Material Protection, Control, and Accounting
MRI	Mutual Reciprocal Inspection
MS	Milestone (acquisition)
MTCR	Missile Technology Control Regime
MTW	Major Theater War
NATO	North Atlantic Treaty Organization
NBC	Nuclear, Biological, and Chemical
NBC/M	Nuclear, Biological, and Chemical weapons and their Means of delivery
NBCRS	NBC Reconnaissance System (XM93 FOX armored vehicle)
NDA	New Drug Application
NDAA	National Defense Authorization Act
NDI	Non-Developmental Item
NDP	National Defense Panel
NDS	Nuclear Detonation Detection System
NEST	Nuclear Emergency Search Team
NFIP	National Foreign Intelligence Program
NMD	National Missile Defense
NODDS	Nuclear Optical Dynamic Display System
NORAD	North American Aerospace Defense Command
NPAC TWG	Nonproliferation and Arms Control Technical Working Group
NPC	Nonproliferation Center
NPRC	Nonproliferation Program Review Committee

NPT	(Nuclear) Nonproliferation Treaty
NRL	Naval Research Laboratory
NSC	National Security Council
NSTC	National Science and Technology Council
NTP	Nuclear Treaty Programs
NTW	Navy Theater Wide (ship-based ballistic missile defense system)
OCONUS	Outside the Continental United States
O&M	Operations and Maintenance
OMB	Office of Management and Budget
Op.	Operational or operations
OPW	Operational Planning Workshops
ORNL	Oak Ridge National Laboratory
OSD	Office of the Secretary of Defense
OSI	Office of Special Investigations (Air Force)
OSIA	On-Site Inspection Agency
OT	Operational Test
P3I	Pre-Planned Product Improvement
PAC	PATRIOT Advanced Capability
PACOM	U.S. Pacific Command
PATS	Protection Assessment Test System
PDD	Presidential Decision Directive
PDRR	Preliminary Design Requirements Review
PDUSD(A&T/S&TS)	Principal Deputy Under Secretary of Defense for Strategic and Tactical Systems (to USD(A&T))
PE	Program Element
Ph.	Phase
POM	Program Objective Memorandum
PPQT	Pre-Production Qualification Test
PPRA	Plutonium Production Reactor Agreement
PrepCom	Preparatory Commission (CTBT)
PTS	Provisional Technical Secretariat (CTBT)
Q	Quarter (fiscal year)
QDR	Quadrennial Defense Review
RADIAC	Radiation Detection, Indication, and Computation
R&D	Research and Development
RDT&E	Research, Development, Test, and Evaluation
RESTOPS	Restoration Operations ACTD
RFP	Request for Proposals

ROK	Republic of (South) Korea
SAIP	Semi-Automated Imagery Processing
SALAD	Shipboard Automated Liquid (CW) Agent Detector
S&T	Science and Technology
SBIR	Small Business Innovation Research
SBIRS	Space-Based Infrared System
SCAMP	Shipboard Chemical Agent Monitor – Portable
SCUD	NATO designator for Soviet theater ballistic missile
SE	Staphylococcal Encephalitis
SEB	Staphylococcal Enterotoxin B
SEI	Specific Emitter Identification
SFAI	Swept Frequency Acoustic Interferometry
SIED	Special Improvised Explosive Device
SLBM	Submarine Launched Ballistic Missile
SM	Standard Missile
SOCOM	U.S. Special Operations Command
SOF	Special Operations Forces
SOI	Silicon-On-Insulator
SO/LIC	Special Operations/Low-Intensity Conflict
SPACECOM	U.S. Space Command
SR-BSDS	Short Range Biological Standoff Detection System
START	Strategic Arms Reduction Treaty
STRATCOM	U.S. Strategic Command
TACMS	Tactical Missile System
TBMD	Theater Ballistic Missile Defense
TCPS	Transportable Collective Protection System
Tech. Eval.	Technical evaluation
TEP	Threat Environment Projection
TESSA	Theater missile defense Eagle Smart Sensor with ATR
TEU	Technical Escort Unit (Army)
TFPM	Tactical FLIR Pod Modification
THAAD	Theater High Altitude Area Defense
THEL	Tactical High Energy Laser
TIARA	Tactical Intelligence and Related Activities
TLAM	Tomahawk Land Attack Cruise Missile
TLD	Themoluminescent Dosimeter
TMD	Theater Missile Defense
TSP	Topical Skin Protectant
TSWG	Technical Support Working Group
TTBT	Threshold Test Ban Treaty
TTP	Tactics, Techniques, and Procedures
TUGS	Tactical Unattended Ground Sensor

TUV	Tactical Unmanned Vehicle
TW/AA	Tactical Warning and Attack Assessment
TWG	Technology Working Group
UAV	Unmanned Aerial Vehicle
UGS	Unattended Ground Sensor
UGV	Unmanned Ground Vehicle
UN	United Nations
UNSCOM	United Nations Special Commission (Iraq)
UOES	User Operational Evaluation System
U.S.	United States
USA	United States Army
USAF	United States Air Force
USCENTCOM	U.S. Central Command
USCS	U.S. Customs Service
USD(A&T)	Under Secretary of Defense (Acquisition and Technology)
USEUCOM	U.S. European Command
US INTELL	U.S. Intelligence
USMC	United States Marine Corps
USN	United States Navy
USPACOM	U.S. Pacific Command
USSOCOM	U.S. Special Operations Command
USSPACECOM	U.S. Space Command
USSTRATCOM	U.S. Strategic Command
UV	Ultraviolet
UXO	Unexploded Ordinance
VEE	Venezuelan Equine Encephalitis
ver	version (software)
VMTF	Verification Monitoring Task Force
VX	designator for a type of chemical nerve agent
WBS	Weapon Borne Sensor
WEE	Western Equine Encephalitis
WMD	Weapons of Mass Destruction

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