AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

DOD CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM: MANAGEMENT AND OVERSIGHT

HEARING

BEFORE THE

SUBCOMMITTEE ON NATIONAL SECURITY, VETERANS AFFAIRS, AND INTERNATIONAL RELATIONS

OF THE

COMMITTEE ON GOVERNMENT REFORM

HOUSE OF REPRESENTATIVES

ONE HUNDRED SIXTH CONGRESS

SECOND SESSION

MAY 24, 2000

Serial No. 106–209

Printed for the use of the Committee on Government Reform

Available via the World Wide Web: http://www.gpo.gov/congress/house
http://www.house.gov/reform

U.S. GOVERNMENT PRINTING OFFICE

71–624 DTP WASHINGTON : 2001

For sale by the Superintendent of Documents, U.S. Government Printing Office
Internet: bookstore.gpo.gov Phone: (202) 512–1800 Fax: (202) 512–2250
Mail: Stop SSOP, Washington, DC 20402–0001

COMMITTEE ON GOVERNMENT REFORM

DAN BURTON, Indiana, *Chairman*

BENJAMIN A. GILMAN, New York
CONSTANCE A. MORELLA, Maryland
CHRISTOPHER SHAYS, Connecticut
ILEANA ROS-LEHTINEN, Florida
JOHN M. MCHUGH, New York
STEPHEN HORN, California
JOHN L. MICA, Florida
THOMAS M. DAVIS, Virginia
DAVID M. MCINTOSH, Indiana
MARK E. SOUDER, Indiana
JOE SCARBOROUGH, Florida
STEVEN C. LATOURETTE, Ohio
MARSHALL "MARK" SANFORD, South Carolina
BOB BARR, Georgia
DAN MILLER, Florida
ASA HUTCHINSON, Arkansas
LEE TERRY, Nebraska
JUDY BIGGERT, Illinois
GREG WALDEN, Oregon
DOUG OSE, California
PAUL RYAN, Wisconsin
HELEN CHENOWETH-HAGE, Idaho
DAVID VITTER, Louisiana

HENRY A. WAXMAN, California
TOM LANTOS, California
ROBERT E. WISE, JR., West Virginia
MAJOR R. OWENS, New York
EDOLPHUS TOWNS, New York
PAUL E. KANJORSKI, Pennsylvania
PATSY T. MINK, Hawaii
CAROLYN B. MALONEY, New York
ELEANOR HOLMES NORTON, Washington, DC
CHAKA FATTAH, Pennsylvania
ELIJAH E. CUMMINGS, Maryland
DENNIS J. KUCINICH, Ohio
ROD R. BLAGOJEVICH, Illinois
DANNY K. DAVIS, Illinois
JOHN F. TIERNEY, Massachusetts
JIM TURNER, Texas
THOMAS H. ALLEN, Maine
HAROLD E. FORD, JR., Tennessee
JANICE D. SCHAKOWSKY, Illinois

BERNARD SANDERS, Vermont (Independent)

KEVIN BINGER, *Staff Director*
DANIEL R. MOLL, *Deputy Staff Director*
DAVID A. KASS, *Deputy Counsel and Parliamentarian*
LISA SMITH ARAFUNE, *Chief Clerk*
PHIL SCHILIRO, *Minority Staff Director*

SUBCOMMITTEE ON NATIONAL SECURITY, VETERANS AFFAIRS, AND INTERNATIONAL RELATIONS

CHRISTOPHER SHAYS, Connecticut, *Chairman*

MARK E. SOUDER, Indiana
ILEANA ROS-LEHTINEN, Florida
JOHN M. MCHUGH, New York
JOHN L. MICA, Florida
DAVID M. MCINTOSH, Indiana
MARSHALL "MARK" SANFORD, South Carolina
LEE TERRY, Nebraska
JUDY BIGGERT, Illinois
HELEN CHENOWETH-HAGE, Idaho

ROD R. BLAGOJEVICH, Illinois
TOM LANTOS, California
ROBERT E. WISE, JR., West Virginia
JOHN F. TIERNEY, Massachusetts
THOMAS H. ALLEN, Maine
EDOLPHUS TOWNS, New York
BERNARD SANDERS, Vermont (Independent)
JANICE D. SCHAKOWSKY, Illinois

EX OFFICIO

DAN BURTON, Indiana
HENRY A. WAXMAN, California

LAWRENCE J. HALLORAN, *Staff Director and Counsel*
R. NICHOLAS PALARINO, *Senior Policy Analyst*
JASON CHUNG, *Clerk*
DAVID RAPALLO, *Minority Counsel*

CONTENTS

	Page
Hearing held on May 24, 2000	1
Statement of:	
Chan, Kwai-Cheung, Director, Special Studies and Evaluation Group, National Security and International Affairs Division, U.S. General Accounting Office, accompanied by Sushil K. Sharma, Assistant Director, and Jeffrey K. Harris, Senior Evaluator	6
Johnson-Winegar, Anna, Deputy Assistant to the Secretary of Defense for Chemical/Biological Defense, Department of Defense	27
Letters, statements, etc., submitted for the record by:	
Chan, Kwai-Cheung, Director, Special Studies and Evaluation Group, National Security and International Affairs Division, U.S. General Accounting Office, prepared statement of	9
Johnson-Winegar, Anna, Deputy Assistant to the Secretary of Defense for Chemical/Biological Defense, Department of Defense:	
Information concerning HNSC/SASC sample	45
Prepared statement of	29
Chenoweth-Hage, Hon. Helen, a Representative in Congress from the State of Idaho, prepared statement of	5
Shays, Hon. Christopher, a Representative in Congress from the State of Connecticut, prepared statement of	3

DOD CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM: MANAGEMENT AND OVERSIGHT

WEDNESDAY, MAY 24, 2000

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON NATIONAL SECURITY, VETERANS AFFAIRS, AND INTERNATIONAL RELATIONS,
COMMITTEE ON GOVERNMENT REFORM,
Washington, DC.

The subcommittee met, pursuant to notice, at 10:15 a.m., in room 2247, Rayburn House Office Building, Hon. Christopher Shays (chairman of the subcommittee) presiding.

Present: Representatives Shays, Blagojevich, and Tierney.

Staff present: Lawrence J. Halloran, staff director and counsel; R. Nicholas Palarino, senior policy advisor; Robert Newman and Thomas Costa, professional staff member; Jason M. Chung, clerk; David Rapallo, minority counsel; and Earley Green, minority clerk.

Mr. SHAYS. I'd like to call this hearing to order and welcome our witnesses and guests.

The Persian Gulf war taught many important lessons about the effective use of our military strength, and about weaknesses in our chemical and biological—CB—defenses. Poor detection capability, bulky protective clothing, and limited supplies of medicines and decontaminants, among other problems, increased the vulnerability of U.S. forces to unconventional attack.

Since then, Congress and the Department of Defense [DOD], have sought to improve the Chemical and Biological Defense Program by integrating previously disparate research, development and acquisition efforts into a coordinated, joint service approach. CBDP spending, $791 million this fiscal year, has more than doubled since 1996.

In the most recent Annual Report to Congress, the Chemical and Biological Defense Program claims success in meeting statutory mandates to consolidate program management, expand jointness among the service branches, and improve force protection against immediate and future CB threats.

But according to the General Accounting Office [GAO], the program may be mistaking motion for progress. CBDP has not yet fully complied with one important congressional mandate: to measure program performance in terms of real outcomes rather than mere activities. The Government Performance and Results Act [GPRA], requires adherence to an overall strategic plan, explicit program goals, and measurable performance benchmarks. Despite an August 1999 GAO recommendation to complete a Results Act-compliant performance plan, the March 2000 CBDP Annual Report

contains little more than the relabeling of last year's goals and the promise of a more complete effort next year.

The Results Act is more than an academic or civics exercise. According to DOD, the chemical and biological threat to U.S. forces is very real. Those charged to design, procure and deploy defensive capabilities to meet that threat should know, and be able to demonstrate, their efforts are working; yet GAO concludes, "In the absence of explicit and measurable goals, it is difficult to assess the impact of the program on warfighters' ability to survive, fight and win in a chemical and biological environment."

Without those performance measures, the program risks losing sight of its real objectives as jointness gives way to service-specific demands and the competing priorities of a very complex management and oversight bureaucracy dilute program focus. By ignoring, delaying or claiming exemption from Results Act requirements, the program risks settling for marginal improvements to existing technologies when those on the battlefield need much more.

This subcommittee spent the past year looking at one aspect of current chemical and biological defense strategy, the Anthrax Vaccine Immunization Program. Today we begin an examination of the broader force protection effort, encompassing detection, agent identification, warning, individual protection, collective protection, and decontamination. On June 21st we plan to look specifically at current inventory controls, training protocols, and service life of individual protective clothing and masks.

We appreciate the cooperation of all our witnesses in this effort, and we look forward to their testimony.

[The prepared statements of Hon. Christopher Shays and Hon. Helen Chenoweth-Hage follow:]

DAN BURTON, INDIANA
CHAIRMAN

BENJAMIN A. GILMAN, NEW YORK
CONSTANCE A. MORELLA, MARYLAND
CHRISTOPHER SHAYS, CONNECTICUT
ILEANA ROS-LEHTINEN, FLORIDA
JOHN M. McHUGH, NEW YORK
STEPHEN HORN, CALIFORNIA
JOHN L. MICA, FLORIDA
THOMAS M. DAVIS III, VIRGINIA
DAVID M. McINTOSH, INDIANA
MARK E. SOUDER, INDIANA
JOE SCARBOROUGH, FLORIDA
STEVEN C. LATOURETTE, OHIO
MARSHALL "MARK" SANFORD, SOUTH CAROLINA
BOB BARR, GEORGIA
DAN MILLER, FLORIDA
ASA HUTCHINSON, ARKANSAS
LEE TERRY, NEBRASKA
JUDY BIGGERT, ILLINOIS
GREG WALDEN, OREGON
DOUG OSE, CALIFORNIA
PAUL RYAN, WISCONSIN
HELEN CHENOWETH-HAGE, IDAHO
DAVID VITTER, LOUISIANA

ONE HUNDRED SIXTH CONGRESS

Congress of the United States
House of Representatives

COMMITTEE ON GOVERNMENT REFORM

2157 RAYBURN HOUSE OFFICE BUILDING

WASHINGTON, DC 20515–6143

MAJORITY (202) 225–5074
MINORITY (202) 225–5051
TTY (202) 225–6852

HENRY A. WAXMAN, CALIFORNIA
RANKING MINORITY MEMBER

TOM LANTOS, CALIFORNIA
ROBERT E. WISE, JR., WEST VIRGINIA
MAJOR R. OWENS, NEW YORK
EDOLPHUS TOWNS, NEW YORK
PAUL E. KANJORSKI, PENNSYLVANIA
PATSY T. MINK, HAWAII
CAROLYN B. MALONEY, NEW YORK
ELEANOR HOLMES NORTON
DISTRICT OF COLUMBIA
CHAKA FATTAH, PENNSYLVANIA
ELIJAH E. CUMMINGS, MARYLAND
DENNIS J. KUCINICH, OHIO
ROD R. BLAGOJEVICH, ILLINOIS
DANNY K. DAVIS, ILLINOIS
JOHN F. TIERNEY, MASSACHUSETTS
JIM TURNER, TEXAS
THOMAS H. ALLEN, MAINE
HAROLD E. FORD, JR., TENNESSEE
JANICE D. SCHAKOWSKY, ILLINOIS

BERNARD SANDERS, VERMONT
INDEPENDENT

SUBCOMMITTEE ON NATIONAL SECURITY, VETERANS AFFAIRS,
AND INTERNATIONAL RELATIONS
Christopher Shays, Connecticut
Chairman
Room B-372 Rayburn Building
Washington, D.C. 20515
Tel: 202 225-2548
Fax: 202 225-2382
GROC.NS@mail.house.gov
http://www.house.gov/reform/ns/

Statement of Rep. Christopher Shays

May 24, 2000

The Persian Gulf War taught important lessons about the effective use of our military strength, and about weaknesses in our chemical and biological (CB) defenses. Poor detection capability, bulky protective clothing, and limited supplies of medicines and decontaminants, among other problems, increased the vulnerability of U.S. forces to unconventional attack.

Since then, Congress and the Department of Defense (DoD) have sought to improve the Chemical and Biological Defense Program (CBDP) by integrating previously disparate research, development and acquisition efforts into a coordinated, joint service approach. CBDP spending, $791 million this fiscal year, has more than doubled since 1996.

In the most recent Annual Report to Congress, the Chemical and Biological Defense Program claims success in meeting statutory mandates to consolidate program management, expand program jointness among the service branches and improve force protection against immediate and future CB threats.

But according to the General Accounting Office (GAO), the program may be mistaking motion for progress. The CBDP has not yet fully complied with one important congressional mandate: to measure program performance in terms of real outcomes rather than mere activities. The Government Performance and Results Act (GPRA) requires adherence to an overall strategic plan, explicit program goals and measurable performance benchmarks. Despite an August 1999 GAO recommendation to complete a Results Act-compliant performance plan, the March 2000 CBDP Annual Report contains little more than the relabeling of last year's goals and the promise of a more complete effort next year.

The Results Act is more than an academic or civics exercise. According to DoD, the chemical and biological threat to U.S. forces is very real. Those charged to design, procure and deploy defensive capabilities to meet that threat should know, and be able to demonstrate, their efforts are working. Yet, GAO concludes, "In the absence of explicit and measurable goals, it is difficult to assess the impact of the Program on warfighters' ability to survive, fight and win in a chemical and biological environment."

Without those performance measures, the program risks losing sight of its real objectives as jointness gives way to service-specific demands and the competing priorities of a very complex management and oversight bureaucracy dilute program focus. By ignoring, delaying or claiming exemption from Results Acts requirements, the program risks settling for marginal improvements to existing technologies when those on the battlefield need much more.

This Subcommittee spent the past year looking at one aspect of current chemical and biological defense strategy, the Anthrax Vaccine Immunization Program. Today, we begin an examination of the broader force protection effort encompassing detection, agent identification, warning, individual protection, collective protection and decontamination. On June 21, we plan to look specifically at current inventory controls, training protocols, and service life of current individual protective clothing and masks.

We appreciate the cooperation of all our witnesses in this effort, and we look forward to their testimony.

Statement of Congressman Helen Chenoweth-Hage
Subcommittee on National Security, Veterans Affairs and International Affairs
Committee on Government Reform
2154 Rayburn House Office Building
May 24, 2000

Thank you, Mr. Chairman. I would like to take this opportunity to thank both the Chairman and the Committee for holding today's hearing regarding "*DoD Chemical and Biological Defense Program: Management and Oversight*." In an age where terrorist groups can effectively deploy their own kitchen-made chemical and biological (CB) weapons, it is absolutely critical to conduct careful oversight into the management of the Biological Defense Program.

Mr. Chairman, to our credit, the United States Congress has recognized that we face genuinely critical chemical and biological threats in this currently unstable world. Two-hundred and ten years ago, George Washington sternly warned Congress, "To be prepared for war is the most effectual means of securing the peace." This prescience should not be overlooked in a world that is now, arguably, more unstable than at any time since the end of World War II.

To more effectively do this, I believe it is of utmost importance that we coordinate the federal government's defense planning when it addresses the CB threat. To more effectively coordinate federal planning, we should focus on reducing management redundancies, and streamline the flow of federal dollars into the programs that are most effective with respect to CB defense.

Mr. Chairman, over the past several months, I have read a number of reports about faulty Nuclear/Biological/Chemical Protective Suits provided to American servicemen. While I do not believe that this problem is indicative of poor management of all CB defense programs, I do believe that it represents a failure on DoD's part to adequately protect our servicemen. To that end, I believe that this hearing is critical in resolving ongoing funding problems and management redundancy issues.

While I think it is critical that we prepare for these CB threats, I believe that we must also exercise great caution in ensuring that no Constitutional lines are crossed by DoD agencies. I will be very interested in examining this issue further in the Committee today. I look forward of hearing from our panel of witnesses to better understand our approach in resolving these tough funding and management issues.

Thank you, Mr. Chairman.

Mr. SHAYS. We have two panels. The first panel is Kwai Chan, Director, Special Studies and Evaluation Group, National Security and International Affairs Division, U.S. General Accounting Office, accompanied by Dr. Sushil K. Sharma, Assistant Director, Special Studies and Evaluation Group, and Dr. Jeffrey K. Harris, Senior Evaluator at National Security and International Affairs Division.

I would invite all of our witnesses on the first panel to come up, and we will swear you in.

[Witnesses sworn.]

Mr. SHAYS. Note for the record that our witnesses have responded in the affirmative.

We welcome your testimony and welcome you here.

STATEMENT OF KWAI-CHEUNG CHAN, DIRECTOR, SPECIAL STUDIES AND EVALUATION GROUP, NATIONAL SECURITY AND INTERNATIONAL AFFAIRS DIVISION, U.S. GENERAL ACCOUNTING OFFICE, ACCOMPANIED BY SUSHIL K. SHARMA, ASSISTANT DIRECTOR, AND JEFFREY K. HARRIS, SENIOR EVALUATOR

Mr. CHAN. Mr. Chairman and members of the subcommittee, I am pleased to be here today to discuss our report on the Department of Defense application of the Results Act in its Chemical and Biological Defense Program.

Before I discuss our findings, let me briefly describe the context.

Subsequent to the Gulf War, concerns were raised about the adequacy of technologies used to detect and protect troops against chemical and biological weapons. The growth in appropriations for the program, from $388 million in fiscal year 1996 to $791 million in the current fiscal year, reflects a continuing and increasing Congressional interest in the protection of our servicemembers.

In 1993 Congress enacted the Government Performance and Results Act. The legislation was designed to have agencies focus on the results of their programs rather than on program activities and resources, as they had traditionally done. Congress drafted this legislation in frustration over vague agency goals and inadequate program performance information. The absence of articulated strategic performance goals and associated performance measures was viewed as a serious impediment to policymaking, spending decisions, and oversight.

The Results Act requires that agencies at all levels set multiyear strategic goals and annual performance goals, measure performance, and report on the degree to which those goals are met. Specifically, each activity is expected to, one, establish quantifiable, measurable outcome-oriented goals and related performance measures; two, develop strategies for achieving these goals; three, ensure that goals align within each agency; and finally, identify the resources that will be required to achieve those goals.

I will now turn to the following four issues, which you asked us to address, and our findings and recommendations: First, whether Results Act principles can and should be applied to the program's R&D activities; second, whether current Chemical and Biological Defense Program planning and evaluation practices follow the Results Act framework; third, whether organizations executing the program's R&D activities have incorporated Results Act principles

in their planning and evaluation practices; and, finally, I will quote DOD's response to our recommendation from August of last year, that DOD should develop a performance plan for the Chemical and Biological Defense Program.

First, congressional reports and administrative guidance clearly indicate that programs such as the Chemical and Biological Defense Program should follow the Results Act's outcome-oriented principles. We found that research organizations, such as the Research Roundtable, the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine have concluded that both applied and basic research programs could be evaluated meaningfully using the Results Act's principles.

Second, we found that program managers have not incorporated key Results Act principles in the planning or in the execution of the program. The five program goals, as stated in its 1999 report, are either vague and unmeasurable, or fail to articulate specific desired impacts. For example, measuring the first goal, which is to deter chemical and biological weapon use by denying military advantage, because determining a deterrent effect is problematic, and attributing the specific rationale for the deterrent is unrealistic.

Three of the five goals addressed the size, focus, and coordination of the program, not program outcomes. Together, these goals direct that the program be sufficiently large to address the needs resulting from two major theater wars; be sufficiently focused to address likely validated threats, and be sufficiently coordinated to capitalize on efficiencies and other benefits of joint requirement determination, research, development, and procurement.

The fifth goal, to complete R&D, is measurable, but addresses program output rather than outcomes.

Third, we found that only one of the three organizations executing the program's R&D activities has adopted Results Act planning and evaluation tools. The remaining R&D organizations cited either the utilization of equivalent planning tools, or the unique challenges of evaluating R&D activities, as reasons why they had not or could not adopt the Results Act processes.

Fourth, DOD has yet to implement our recommendation that it develop a performance plan for the Chemical and Biological Defense Program. In its response to GAO, DOD stated that it "would develop a strategic plan more closely aligned with the tenets of the Results Act," and that it "would publish that plan in the program's next Annual Report to Congress." Nevertheless, its March 2000 report to Congress does not contain a performance plan.

DOD has instead defined seven new program goals and stated that "specific technology and systems goals will be provided" in its performance plan, under development.

It is important to note that the steps taken and promised in the March 2000 report to the Congress still reflect only partial compliance with the first of the four outcome-oriented principles, by failing even to identify quantifiable, measurable outcome-oriented performance goals.

DOD has not begun to address the other three principles of the Results Act. Consequently, in the absence of explicit and measurable performance goals, a strategy for achieving those goals, alignment of those goals within each agency, as well as the resources

required, the Congress and the DOD cannot assess the impact of the Federal funding for this program on warfighters' ability to survive, fight, and win in a chemical or biological contaminated environment.

Mr. Chairman, this concludes my statement. We will be happy to answer any questions.

[The prepared statement of Mr. Chan follows:]

United States General Accounting Office

GAO

Testimony

Before the Subcommittee on National Security, Veterans' Affairs, and International Relations, Committee on Governmental Reform, House of Representatives

For Release on Delivery
Expected at 10:00 a.m. May 24, 2000, Wednesday

CHEMICAL AND BIOLOGICAL DEFENSE

Program Planning and Evaluation Should Follow Results Act Framework

Statement of Kwai-Cheung Chan, Director, Special Studies and Evaluations, National Security and International Affairs Division

GAO/T-NSIAD-00-180

Dear Chairman and Members of the Subcommittee:

We are pleased to be here to discuss our August 1999 report on the Department of Defense's application of the Government Performance and Results Act in its Chemical and Biological Defense Program.[1] In the last decade, concerns about the possible use of chemical and biological weapons in both military and civilian settings led Congress to increase funding for new and expanded initiatives to counter these threats. For example, the Chemical and Biological Defense Program appropriation has more than doubled from $388 million in fiscal year 1996 to $791 million. Today we will address whether a framework exists to monitor and evaluate the impacts of the increased funding on protecting service members from the effects of chemical and biological warfare agents.

Since the Persian Gulf War, members of Congress have raised concerns regarding the adequacy of technology used by the Department of Defense (DOD) to detect, identify, prepare for, and protect troops against chemical and biological weapons.[2] In 1993, the National Defense Authorization Act for Fiscal Year 1994 (P.L. 103-160) directed the Secretary of Defense to take actions to improve the Department's chemical and biological defense capabilities, including coordination and integration of all chemical and biological defense programs into what is now the Chemical and Biological Defense Program. More recently, concerns that terrorists might use chemical or biological devices led Congress to authorize the federal government to improve domestic capabilities to respond to such incidents. With the initiation of these domestic preparedness programs in fiscal year 1997, federal research and development efforts to develop nonmedical chemical and biological defense technology expanded considerably, and they continue to grow.[3]

In 1993 Congress enacted the Government Performance and Results Act (commonly referred to as the Results Act). The legislation was designed to have agencies focus on the performance and

---

[1] Chemical and Biological Defense: Program Planning and Evaluation Should Follow Results Act Framework (GAO/NSIAD-99-159, Aug. 16, 1999).

[2] See Chemical and Biological Defense: Emphasis Remains Insufficient to Resolve Continuing Problems (GAO/NSIAD-96-103, Mar. 29 1996) and Chemical Weapons: DOD Does Not Have a Strategy to Address Low-Level Exposures (GAO/NSIAD-98-228, Sept. 23, 1998).

[3] Nonmedical technologies refer to technologies for detecting, identifying, protecting against, or decontaminating personnel and equipment of chemical and biological agents. By contrast, examples of medical research and development include the development of prophylactics such as vaccines, medical diagnostics for determining exposure to chemical or biological agents, and therapeutic drugs or procedures for countering the effects of exposure.

results of their programs, rather than on program activities and resources, as they had traditionally done. Congress sought to shift federal management and oversight from its preoccupation with program staffing, activity levels, and tasks completed to program results—that is, to the real differences that federal programs make in people's lives. The outcome-oriented principles of the Results Act, which Congress anticipated would be institutionalized and practiced at all organizational levels in federal agencies, include (1) establishing general goals and quantifiable, measurable, outcome-oriented performance goals and related measures; (2) developing strategies for achieving the goals, including strategies for overcoming or mitigating major impediments to goal achievement; (3) ensuring that goals at lower organizational levels align with and support the general goals; and (4) identifying the resources that will be required to achieve the goals.

We examined the extent to which DOD has applied the Results Act's outcome-oriented principles to the Chemical and Biological Defense Program, focusing in particular on research and development, testing, and evaluation (henceforth referred to as R&D) activities that lead to new defense technologies and capabilities. Specifically, we assessed whether (1) Results Act principles can and should be applied to the Chemical and Biological Defense Program's R&D activities, (2) current Chemical and Biological Defense Program planning and evaluation practices follow the Results Act framework, and (3) organizations executing the R&D activities have incorporated Results Act principles in their program planning and evaluation practices. Moreover, we examined whether DOD has implemented our recommendation to development of a performance plan for the Chemical and Biological Defense Program based on the outcome-oriented management principles embodied in the Results Act.

SUMMARY

Congressional reports and administrative guidance indicate that DOD programs such as the Chemical and Biological Defense Program should follow the Results Act's outcome-oriented principles, including the establishment of general goals; quantifiable, measurable, outcome-oriented performance goals; and related measures. Moreover, research organizations such as the Research Roundtable, the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine have concluded that both applied and basic research programs supported by the federal government could be evaluated meaningfully in accordance with the Results Act framework.

DOD's Chemical and Biological Defense Program in general, and its R&D activities in particular, have not incorporated key Results Act principles. Program goals are vague and unmeasurable and the performance measures emphasize activities rather than impacts. In the absence of explicit and measurable goals, it is difficult to assess the impact of the Program on warfighters' ability to survive, fight, and win in a chemical and biological environment.

Chemical and Biological Defense Program research and development organizations have incorporated Results Act principles inconsistently. Only one of three DOD organizations that engage in R&D activities in support of the Chemical and Biological Defense Program has adopted the Results Act planning and evaluation tools. The remaining two cited either the utilization of equivalent planning tools or the unique challenges of evaluating research and development activities as reasons for not adopting the Results Act processes.

Our August 1999 report recommended that the Secretary of Defense direct that actions be taken to develop a performance plan for the Chemical and Biological Defense Program based on the outcome-oriented management principles embodied in the Results Act. DOD concurred with the recommendation and agreed to develop a full detailed and coordinated plan for inclusion in its next DOD Chemical and Biological Defense Program Annual Report to Congress. Nevertheless, the next Report to Congress in March 2000 did not contain a plan containing the elements outlined in our recommendation. In the March 2000 Report to Congress, DOD established a new set of program goals and stated specific technology and systems goals will be included in a performance plan to be completed during calendar year 2000 and included in the next annual report to Congress.

BACKGROUND

The DOD's Chemical and Biological Defense Program addresses three nonmedical defensive capabilities: contamination avoidance, protection, and decontamination.[4] These areas comprise the DOD's framework for developing nonmedical program requirements. When changes in doctrine, training, or organizational structure cannot satisfy warfighters' needs in these areas, DOD seeks new equipment through the research, development, and acquisition cycle. Chemical and biological

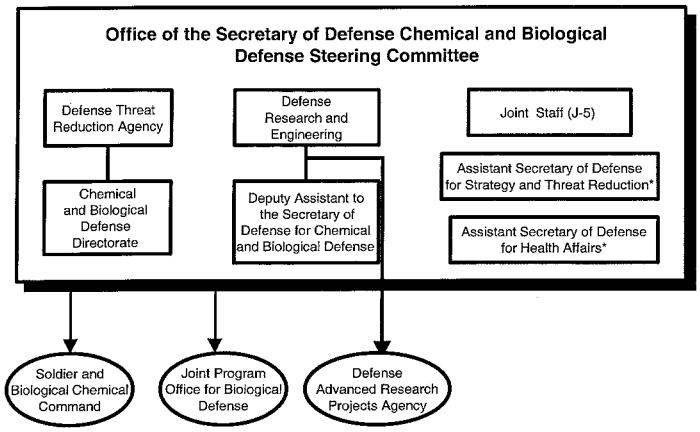
[4] Contamination avoidance includes detecting, avoiding, and bypassing contaminated areas; protection consists of individual and collective protection; decontamination is the restoration of combat power after a chemical and biological attack.

defense funding is divided between the program's two primary activities: R&D and procurement. Of the Chemical and Biological Defense Program appropriation of $791 million in fiscal year 2000, $410 million (52 percent) is for R&D and the remaining $381 million (48 percent) for procurement.

Consistent with the National Defense Authorization Act for Fiscal Year 1994,[5] the Secretary of Defense assigned responsibility for the overall coordination and integration of the Chemical and Biological Defense Program to a single office headed by the Deputy Assistant to the Secretary of Defense for Chemical and Biological Defense. The office is responsible for approving all planning, programming, and budgeting documents; ensuring coordination between the medical and nonmedical chemical and biological defense efforts; and overseeing management oversight in accordance with the law. The Deputy Assistant to the Secretary of Defense manages program research, development, and acquisition efforts for Chemical and Biological Defense. The Deputy Assistant Secretary is also Executive Secretary of a Steering Committee that is responsible for oversight of the program. In August 1999 the Steering Committee was comprised of the Directors of the Defense Threat Reduction Agency and Defense Research and Engineering as well as their top officials responsible for chemical and biological defense. Since our report was issued, the membership of the Committee has been expanded to include representation for the joint Chiefs of Staff, the Assistant Secretary of Defense for Strategy and Threat Reduction, and the Assistant Secretary for Health Affairs, as depicted in figure 1.

[5] P.L. 103-160, sec. 1701.

Figure 1: DOD Chemical and Biological Defense Program Oversight Structure and Selected DOD Organizations Executing Research and Development



*Non-Voting Members

Source DOD

As illustrated in figure 1, the program's DOD research and development organizations in the execution of the program include the Soldier and Biological Chemical Command,[6] the Joint Program Office for Biological Defense,[7] and the Defense Advanced Research Projects Agency.[8]

---

[6] The Soldier and Biological Chemical Command is organized around two integrated business areas, one of which is research, development, and acquisition. Nearly half of its research, development, and acquisition funding supports the Chemical and Biological Defense Program. The Command is engaged in the full range of research and development encompassing both biological and chemical systems. Its business areas include chemical detection, biological detection, decontamination, protection, and supporting science and technology.

[7] The Joint Program Office for Biological Defense manages the biological warfare agent detection program. The office monitors emerging technologies for advanced development, demonstration, and upgrades of fielded biological detection systems.

[8] The Defense Advanced Research Projects Agency's Biological Warfare Defense Program is an applied research program established under the authority of the National Defense Authorization Act for Fiscal Year 1997 (P.L. 104-201, as amended) to fund revolutionary new approaches to biological warfare defense. The Biological Warfare Defense Program pursues high-risk, high-potential technologies from the demonstration of technical feasibility through the development of prototype systems.

THE CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM SHOULD FOLLOW THE RESULTS ACT'S OUTCOME-ORIENTED PRINCIPLES

Congressional and administrative guidance indicate that DOD programs such as the Chemical and Biological Defense Program should follow the outcome-oriented principles of the Results Act. The 1997 Quadrennial Defense Review,[9] which serves as DOD's overall strategic planning document, directs DOD organizations at all levels to review their objectives to ensure that they link to the goals and objectives of the Quadrennial Defense Review and to ensure that Results Act performance plans indicate progress toward meeting Quadrennial Defense Review goals. DOD guidance for implementing the Results Act states that the goals, objectives, measures of success, quantifiable performance measures, and program outcome evaluations of subordinate organizations should be linked to the DOD goals articulated in the Quadrennial Defense Review and made operational in DOD's annual performance plan. Chemical and Biological Defense Program R&D activities support DOD's second goal to "prepare now for an uncertain future by pursuing a focused modernization effort that maintains U.S. qualitative superiority in key warfighting capabilities."

Congress has recognized that successful implementation on the Results Act in science agencies would not come quickly or easily. Nonetheless, several professional science organizations have concluded that the Results Act principles can or should be applied to R&D. The Research Roundtable, a group of federal researchers and managers representing a cross section of departments and agencies, concluded in 1995 that the results of a research program's performance could be measured. The Army Research Laboratory was designated as a pilot project for performance measurement under the act and ultimately outlined an evaluation approach that made use of three pillars: metrics, peer review, and customer feedback. In 1999, the Committee on Science, Engineering, and Public Policy of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine concluded that both applied and basic research programs supported by the federal government could be evaluated meaningfully on a regular basis.

[9] The 1997 Quadrennial Defense Review was a comprehensive examination of the defense strategy, force structure, force modernization plans, infrastructure, budget plan to determine defense strategy and a defense program through the year 2005 as required by the National Defense Authorization Act of Fiscal Year 1997 (P.L. 104-201). Congress has recently established a permanent Quadrennial Defense Review (the National Defense Authorization Act for Fiscal year 2000, P.L. 106-65).

DOD'S CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM IN GENERAL, AND ITS R&D ACTIVITIES IN PARTICULAR, HAVE NOT INCORPORATED KEY RESULTS ACT PRINCIPLES

Results Act outcome-oriented principles have not been widely applied by either Chemical and Biological Defense Program planners or executing organizations. Chemical and biological defense research and development outcomes and impacts are not being systematically measured because the Program lacks both quantifiable performance goals and measurable objectives.

Although DOD has taken the initial and necessary step of articulating Chemical and Biological Defense Program goals, the goals are not articulated in a manner consistent with Results Act principles. The stated goals are vague and unmeasurable, and they fail to articulate specific desired impacts. A Results Act framework requires that managers define a related set of long-term strategic goals, annual agency goals, and measurable performance goals for each program. In 1999, the five Chemical and Biological Defense Program goals were to

- deter chemical and biological weapon use by denying military advantage to an enemy through a combination of avoidance, protection, decontamination, and medical support capabilities, allowing U.S. forces to operate largely unimpeded by chemical and biological attacks and their subsequent effects;

- address the most probable chemical and biological weapon threats that could be encountered in regional conflicts and field capabilities to the forces required for two major theater wars;

- ensure the chemical and biological weapon threat drives chemical and biological defense research, development, and acquisition programs;

- emphasize a joint service approach to chemical and biological defense R&D, and acquisition; and

- complete critical R&D and acquisition of improved chemical and biological detection, identification, and warning systems; individual and collective protection systems; and medical support and decontamination systems.

Measuring the first goal is unachievable, determining a deterrence effect is problematic, and attributing the specific rationale for the deterrence is unrealistic. The second, third, and fourth goals address the size, focus, and coordination of the program—not program outcomes. Together, these goals direct that the program be sufficiently large to address the needs resulting from two major theater wars; sufficiently focused to address the likely validated threats; and sufficiently coordinated to capitalize on efficiencies and other benefits of joint requirements determination, research, development, and procurement. The objective of the fifth goal is measurable but addresses program outputs without discussing program outcomes or impacts (such as decreased defensive vulnerabilities or increased operational capabilities). The completion of R&D or procurement cannot be assumed to result in a positive impact on the defensive posture or operational flexibility of U.S. forces. While the completion of these activities may generate benefits for U.S. troops, in the absence of valid, reliable measures, the contributions of R&D or procurement cannot be determined.

Program planners cite the execution of technology development plans, and the completion of defense technology objectives and advanced concept technology demonstrations[10] as measures of progress toward program goals. Program planners cited a number of supporting plans as being "in the spirit of the Results Act," even though not specifically assessing outcomes and impacts. For example, DOD's Chemical and Biological Defense Annual Report to Congress[11] and the Joint Service Nuclear, Biological, and Chemical Defense Research, Development, and Acquisition Plan are updated annually and include detailed metrics and time lines reflecting the program performance in developing new defense technologies. Technology development plans track progress toward defense technology objectives and advanced concept technology demonstrations that, when achieved, DOD claims will create new operational capabilities. In addition, Chemical and Biological Defense Program planners cited ongoing programmatic peer reviews, such as Technology Area Review Assessments, as additional means to measure progress toward meeting program goals.

---

[10] Advanced concept technology demonstrations assess the military utility of mature technologies and their capabilities in realistic operational scenarios. Chemical and biological defense capabilities that have been explored through these technology demonstrations include the capability to (1) provide early warning of remote biological warfare agents; (2) detect, warn, identify, protect, and decontaminate air bases and seaports against biological attack; and (3) integrate biological and chemical detection and early warning capability at an air base or seaport.

[11] Submitted to Congress annually pursuant to 50 U.S.C. 1523.

We do not agree that the conduct of an advanced concept technology demonstration measures the impact of the Chemical and Biological Defense Program on the warfighter. Advanced concept technology demonstrations represent a means for rapidly introducing new technologies and reducing the time from the start of a program to the system's initial operational capability. However, the demonstration of a new technology may not by itself result in the effective and safe deployment of a military capability in support of the warfighter. Moreover, as we previously reported, DOD has not always emphasized the need to complete concept and product development or testing before production, thus increasing the risk of approving advanced concept technology demonstrations in support of chemical and biological defense that include immature technologies and then prematurely starting production.[12]

We also do not agree that peer reviews measure the impact of the program on the warfighter. Technology Area Review Assessments are peer reviews conducted by the Director, Defense Research and Engineering on each of DOD's 12 science and technology programs—one being, chemical and biological defense. These peer reviews address progress toward achieving defense technology objectives and form the basis of DOD's performance in science and technology.[13] However, the application of the assessments to generate performance measures of DOD's science and technology programs—such as chemical and biological defense—is limited by several factors. First, the measure is limited because these peer reviews only address defense technology objectives. Funding for these objectives, however, comprises less than 50 percent of total funding for applied and advanced technology development research and development. Thus, the Results Act ratings do not capture the majority of the Chemical and Biological Defense Program's R&D activities. Second, the focus of Technology Area Review Assessments is on budgets, schedules, and technical performance. The reviews do not measure technology transition from the laboratory to the battlefield. Lastly, the peer reviews do not measure improvements in the ability of U.S. troops to survive, fight, and win in a chemical and biological environment.

---

[12] Defense Acquisition: Advanced Concept Technology Demonstration Program Can Be Improved (GAO/NSIAD-99-4, Oct. 15, 1998).

[13] In fiscal year 1999, 23 chemical and biological defense defense technology objectives existed, many in the form of advanced concept technology demonstrations.

THE PROGRAM'S RESEARCH AND DEVELOPMENT ORGANIZATIONS HAVE INCORPORATED RESULTS ACT PRINCIPLES INCONSISTENTLY

The three DOD organizations that execute or contribute to the research and development goals of the Chemical and Biological Defense Program vary in their use of the Results Act principles to plan and assess their activities. The Soldier and Biological Chemical Command is the only R&D organization to systematically apply results act principles. The Soldier and Biological Chemical Command has demonstrated that the Results Act principles can be integrated into the planning and evaluation process of an organization conducting research and development for the Chemical and Biological Defense Program. The Command's strategic plan for fiscal years 1998 – 2004 is driven by and linked with the strategic plans of DOD, the Army, and the Army Materiel Command. Its strategic planning model directly links the attainment of its vision with the development of goals and enabling strategies—followed by the execution of the strategies and measurement of performance. Separate measures were developed to assess goal achievement as well as progress toward goal achievement.

The performance plan for fiscal years 1998 – 2004 identifies performance measures for each Command goal and performance goals for each strategy. The performance measures address both accomplishments and progress toward accomplishments. Examples of quantitative measures of research and development accomplishments include (1) the percentage of new chemical and biological systems that meet survivability requirements, (2) the percentage of nonexempt acquisitions receiving waivers from performance specifications, and (3) the percentage of Command science and technology programs transitioning to joint service and Army development programs with user validation through modeling, wargames, or similar methods. Command officials noted that identification of measures in the research and development has been an ongoing challenge and continues to evolve.

In contrast, neither the Defense Advanced Research Projects Agency, nor the Joint Program Office for Biological Defense has developed a performance plan. The reasons cited for not incorporating the Results Act's principles into their program planning or evaluation systems were that current DOD planning processes were equivalent to those of the act, resulting in plans that were "in the spirit" of the Results Act[14] and that the unique nature of R&D activities did not lend itself to the act's

[14] Chemical and Biological Defense Program managers stated that DOD's Planning, Programming, and Budgeting System is equivalent to the system required by the act and that therefore no substantive changes are necessary to comply with the spirit of the legislation. The DOD Comptroller has noted that the Results Act is related to, but distinct from, DOD's Planning, Programming, and Budgeting System and has stated that Results

performance measurement and evaluation. The Joint Program Office cites the conduct of advanced concept technology demonstrations as measures of its performance. Defense Advanced Research Projects Agency officials maintained that the nature of the Agency's mission – to pursue long-term, far-reaching, and high-risk/high-payoff technology and systems for military systems in the distant future – does not lend itself to the application of performance measurement. In December 1998, the Defense Management Council agreed and notified the Agency that it was exempt from the Results Act requirements.

CONCLUSIONS

Chemical and biological defense research and development outcomes and impacts are not being systematically measured. The Chemical and Biological Defense Program lacks both quantifiable performance measures and measurable objectives. In the absence of measures of program impacts and measurable objectives, progress toward achieving program goals cannot be determined. Program planning consists of a series of technology development plans leading to specific equipment items. Managers cite activity measures and technology demonstrations as measures of the program's contribution. These planning and programming steps are appropriate and necessary, but they are insufficient for quantifying outcomes and impacts. Current measures do not assess the incremental changes attributable, in whole or in part, to the Chemical and Biological Defense Program that improve warfighters' ability to survive, fight, and win in a chemical and biological environment.

Results Act outcome-oriented principles have not been widely applied by either Chemical and Biological Defense Program planners or executing organizations. The use of these principles can enable managers and those overseeing the program to quantify the relative success of the program and of component projects in satisfying requirements across different activities (e.g., point detection, early warning, warning and reporting, modeling). Impact measures can provide a planning tool to allocate finite Chemical and Biological Defense Program resources among competing sets of unmet requirements.

Act planning and program evaluations need to be integrated with DOD's Planning, Programming, and Budgeting System.

RECOMMENDATION

In August 1999, we recommended that the Secretary of Defense direct the development of a performance plan for the Chemical and Biological Defense Program based on the outcome-oriented management principles embodied in the Results Act. We specified that the plan should be agreed to and supported by the relevant R&D organizations and incorporated in DOD's Chemical and Biological Defense Annual Report to Congress. Specifically, the plan should (1) establish explicit and outcome-oriented goals linked to warfighters' ability to survive, fight, and win in a chemical and biological environment; (2) identify quantitative or qualitative performance measures that can be used to assess progress toward goal achievement; (3) describe how performance data would be validated; (4) describe how R&D activities of participating DOD and non-DOD organizations are coordinated to achieve program goals; and (5) identify human capital, financial, and resource challenges or external factors that limit the ability of the program to achieve its goals.

DOD RESPONSE

DOD agreed with our recommendation to develop a performance plan and stated it would develop a strategic plan more closely aligned with the tenets of the Results Act and publish that plan in the next DOD Chemical and Biological Defense Annual Report to Congress. Nevertheless, the March 2000 Report to Congress does not contain a performance plan. DOD has defined seven new program goals and stated that more specific technology and systems goals will be included in a performance plan under development. The steps taken and promised in the March 2000 Report to the Congress still reflect only partial compliance with the first of the four outcome-oriented principles by failing even to identify quantifiable, measurable, outcome-oriented performance goals. DOD states that specific technology and systems goals will be included in a performance plan to be completed during calendar year 2000 and included in the next annual report to Congress.

Thus concludes our formal statement. If you or other members of the committee have any questions, we will be pleased to answer them. For future contacts regarding this testimony, please contact Kwai-Cheung Chan at (202) 512-3652. Individuals making key contributors to this assignment were Sushil Sharma, Jeffrey Harris and Weihsueh Chiu.

(713064)

Mr. SHAYS. When I was first elected to Congress, I was exposed to a report about our protective gear, and it was alarming. What was alarming was that test studies would indicate that the protective gear wasn't doing the job it was designed to do. At the time, it was a classified document, and it was very frustrating for me to be aware of this document.

I went to other Members to share it with them, as I could, which is to say that I am going to see that a good deal of this committee's energy and time is spent understanding the quality of our protective gear, and hold the DOD and others accountable for what is required.

But what I would like to ask you first, Mr. Chan, is this. I would like to know what is the general attitude of DOD when you get into these issues. Do they take GPRA seriously? Do they feel that they are doing important work? Do they take seriously, in your judgment, the value of the program?

Mr. CHAN. Well, our initial experience was when we did our work, the person in charge of the program was quite vehement in the sense that he didn't think it was necessary for them to follow the Results Act.

Mr. SHAYS. So to start with, they didn't take the view that they came under GPRA, under the Results Act, or that they felt they weren't compatible, that the Results Act wouldn't be helpful to them—besides being a legal requirement, that it wouldn't be helpful to them?

Mr. CHAN. First, the belief was that the QDR itself, the Quadriennial Report Review, would answer the questions on what this is all about, but second, I think there was some concern on how you apply GPRA to the research and development side.

Subsequent to that, I think the next leadership felt that it is important to apply it, and I think that's why you see some progress in the March 2000 report.

To me, there is sort of a conflict between what seem to be good management tools versus the utilization of those tools. It's sort of good management principles to have these tools so that one can tell what is the mission of this program, and how do you go about implementing it, how do you measure it, so that at the end we understand what the outcome is, and the report will reflect outcome of the spending of the dollars on.

Mr. SHAYS. Describe to me in general terms what you think the role of CBDP is.

Mr. CHAN. Well, I think in 1993 and 1994 Congress was concerned about lack of capability of our soldiers to fight in a contaminated environment, and had in fact decided to focus on giving sufficient funding in this program to actually manage all RD&A—that is, research, development and acquisition—systems by which it can help in terms of its mission. So it has a very far-reaching mandate.

Mr. SHAYS. I know that you stated this in your report, but I would like to ask you specifically—well, you answered that, so I don't need to go over it.

What are the difficulties of translating the annual goals into a performance plan?

Mr. CHAN. Mr. Chairman, the issue that is yet unaddressed to our satisfaction in the presentation of program goals in the annual

report is that it can't be determined from the information available, whether or not the program goals are threat-driven, and if they're measurable. We think that we need an entire packet of information, beginning with strategic goals, annual performance goals, performance measures for those annual goals, and a plan to address any deficiencies that may be identified—to put a package together to identify what is or is not adequate.

The concept of the Results Act, with its layout of the steps that the Congress has articulated, I think is quite easy to understand and conceptualize, but the articulation of measurable goals is the hurdle that has to be overcome first. And right now, it cannot be determined if the goals presented in the plan are simply asking for incremental improvements in existing capabilities, or is there an ideal capability that the users require to avoid the chemical and biological threats where they need to have a goal of a capability versus an incremental improvement over existing equipment.

Mr. SHAYS. But the bottom line is that you are not able to determine whether or not they are meeting goals and certain strategies because you are not sure, in every instance, what their goals and strategies are? Is that correct?

Mr. CHAN. Correct.

Mr. SHAYS. OK.

Before welcoming our two members, let me just get two housekeeping measures out of the way.

I ask unanimous consent that all members of the subcommittee be permitted to place any opening statement in the record, and that the record remain open for 3 days for that purpose. Without objection, so ordered.

I ask further unanimous consent that all witnesses be permitted to include their written statements in the record. Without objection, so ordered.

Let me just say before recognizing both Mr. Blagojevich and Mr. Tierney, that we view this first hearing as kind of "putting the ball in play." We're not going to get in any great depth today, but the purpose is just to begin this process. We don't anticipate that this is going to be a particularly long hearing, but, Mr. Chan, when you're done, I hope that you or your staff can stay to hear what is said and to make some comment on it as well.

Mr. Blagojevich, welcome.

Mr. BLAGOJEVICH. Thank you, Mr. Chairman. I just intend to listen for a little while. I have no questions at this point, but perhaps later.

Mr. SHAYS. Mr. Tierney.

Mr. TIERNEY. Let me just ask the three of you, is there any question that we should be asking you before sit down? And if there is, you can tell me what it is and I'll ask it again, so that you will feel like I've asked you.

Dr. Sharma, I've never known you to be here and not say something. [Laughter.]

Mr. SHARMA. I was going to pass, but now I have to speak. [Laughter.]

I think I have a comment rather than a question, in anticipation that you would ask me to answer, so let me sort of describe to you what our expectations are in terms of the Results Act.

As we understand, in the CB defense area, threat is the guiding force, that is validated threats. Based on validated threats, the users—which are the services and various commands—may develop some requirements to deal with those threats, and the funding that you are providing is to make sure that we have enough capabilities so that our soldiers could survive in a contaminated environment and accomplish the mission.

In order for us to evaluate what our money is buying, one needs to show that the technologies that are coming out, or the various equipments that we are supplying to our fighters—what effect, if any, they are having on the threat. And when you look at the existing plan, it appears that the focus is on commodity areas, on technologies, on improvements over existing technologies. Although they have pieces in place that can answer the question for you, it hasn't really been put together by the Department at this point so that you could evaluate the outcome of the funding—that is, what is our money buying? We have had very detailed discussions with the program level people, who agreed with us that it should be done this way. We have let the Department know that we will be available to them to assist them at various points in time when they feel they have something to share with us.

It is a new thing for them to do, and we will be very happy to assist them. However, at this point they have a long way to go.

Mr. TIERNEY. That raises the question—I mean, we've asked this of all Departments, of all units within Departments, and so on, to do the Results Act, correct? I mean, throughout Government, it's Government-wide?

Mr. SHARMA. That is correct.

Mr. TIERNEY. Is it GAO's responsibility to assist in that effort, or is it something that you all have just taken on as something you think you can do?

Mr. SHARMA. I don't think it is our responsibility. We have, in this particular case, offered assistance to them.

Mr. TIERNEY. OK.

Mr. SHARMA. It is the agency's responsibility to develop the plan and evaluate it itself, and show it to the Congress, the results of their efforts in accomplishing the mission.

Mr. SHAYS. Mr. Chan, maybe I should ask you this, in that I'm prepared to move on to the next panel.

You're not saying that they are not meeting their goals, you're saying that in some cases we don't know what their goals are. It may be that we're doing really great, but if we are, it's more by accident than by planning—those are my words. In other words, you can't make an assessment of where we are because you don't have the measurement tools in place without them following——

Mr. CHAN. Well, I can make an assessment. I think they haven't done that, unfortunately.

Mr. SHAYS. They haven't what?

Mr. CHAN. They have not done that, because I think what we have right now is an assessment whereby we are pursuing based on threat, and what technology we have, and we're putting a lot of eggs in different baskets, and hopefully something will come out of there at the end. But I don't think it makes a good strategy in terms of——

Mr. SHAYS. Well, that's a different issue. I'm not trying to get them off the hook; I'm just trying to assess—you're not claiming that we are unprepared and that we are not doing a good job; the claim is that without these measuring tools, we don't know? And it seems to me that your claim is also that without specific focus on the Results Act, we clearly aren't maximizing the resources that we have to get there as quickly as we can, correct?

Mr. CHAN. Yes.

Mr. SHAYS. Dr. Harris, did you have any comments you wanted to make?

Mr. HARRIS. I just wanted to add what Dr. Chan and Dr. Sharma said, a couple points. One is that the way the program is described right now, it is very easy to say that we are making progress in achieving our goals because we are producing a better piece of equipment tomorrow than we had yesterday, and we can say that we can buy more of that with the moneys available from Congress than we had yesterday, and say that this is progress.

But the plan that the Results Act requires should identify is, what are the pieces of equipment that are needed? What are the descriptions of the ideal equipment, the ideal capabilities that warfighters need? And we don't know exactly where we need to get to, so we don't know exactly how far away from that ideal we are today.

Another element that should be this, in the spirit of the Results Act, is that we have goals identified in the report that are commodity area-specific, to detect, to protect, to decontaminate. There is no system in place to relate the relative benefits of competing goals. We don't know, without a Results Act implementation, if we might better spend our money for procurement or research and development—or, within research and development, what area is in the most need of additional assistance.

So these are things we think will be there when the full implementation of the Results Act is completed.

Mr. SHAYS. Yes, Mr. Chan?

Mr. CHAN. I would like to say that the Results Act itself is a management tool by which the Government sort of "mandates" the agencies to determine how they are spending the money, and how well they are spending the money.

In this case here, as we stated, from 1996 to the year 2000, the budget itself had doubled over that period of time. And without knowing what we're getting out of this money or this investment, then there's no way to account for—have we, in fact—where are we in terms of achieving the goals or providing that the mission of protecting our soldiers in the contaminated CBW environment? That's really the final outcome that you want to see.

So as a result, without doing that, there's a lack of accountability.

Mr. SHAYS. Why don't you go ahead?

Mr. HALLORAN. In your testimony you said that you found that only one of the three organizations was executing the program's R&D activities as a result of Results Act planning. May I ask you to name names there, what the other two are?

Mr. HARRIS. OK. We identified three key Department of Defense organizations that are executing research and development on be-

half of the Chemical and Biological Defense Program. Those three organizations are the Soldier Biological Systems Command, which is an element of the Army Materiel Command, Department of the Army; the second is the Defense Advanced Research Projects Agency [DARPA]; and the third is the Joint Project Office for Biological Defense.

The Soldier Biological Systems Command is the organization that has been applying the Results Act in detailed steps for a number of years, identifying strategic goals, annual goals, measures, assessing their performance, and writing reports feeding back on how well they're doing. It is a template that is—it's the best template we found for a research and development organization in this area for executing Results Act principles.

In DARPA, they made the argument that what they do is so far-reaching and so long-term that an annual assessment is impractical, and the DOD Management Council agreed with that.

The Joint Program Office is an office that conducts system-specific development activities, often in the form of Advanced Concept Technology Demonstrations. And they, again, thought that what they were doing in terms of developing new equipment and making equipment better, that would be an inappropriate application of the Results Act.

Mr. HALLORAN. Do you agree with that?

Mr. HARRIS. No. We think it can be done, and it's simply a change in philosophy and attitude that has to be accepted by those who are executing the program, that they have to identify where they're going before they can determine how well they are achieving those goals.

Mr. SHAYS. Is that an option, that they are allowed to ignore the Results Act?

Mr. HARRIS. The one example that we have, where the organization argued that it was inappropriate and was exempted internally within DOD, is DARPA, and they argued that they are such a unique organization that it wouldn't apply—even though before that exemption was allowed, they had developed internal measures that they were going to apply in terms of peer review, in terms of progress toward meeting milestones, that they thought might be applicable and in accordance with Results Act requirements. But in the end, they turned out to be granted an exemption.

Mr. SHAYS. I would think, frankly, that DARPA would need it more than others. What's the budget of DARPA?

Mr. HARRIS. I don't believe I have those figures. It's a considerable percent of the entire DOD R&D budget.

Mr. SHARMA. If I may add to this, Mr. Chairman, it is our understanding that there are no exemptions. At the agency level, at the top level, they have to have a plan; and then every entity within that organization has to follow and to be able to account for the money that they are receiving, to be very precise. However, in this case, DOD has given an exemption to DARPA.

Mr. SHAYS. Thank you very much, unless there is anything else any of you want to add. Any other comments?

[No response.]

Mr. SHAYS. OK, thank you.

I would like to call our second panel, Dr. Anna Johnson-Winegar, Deputy Assistant to the Secretary of Defense for Chemical/Biological Defense, Department of Defense.

Dr. Winegar, we welcome anyone else; it's not like you have lawyers next to you, it's not in any way a disadvantage.

I just want to say again, if you think there is someone who might answer a question, I would love to swear them in. They can remain in the back, but even if they don't, it would help us out.

Ms. JOHNSON-WINEGAR. Not today.

Mr. SHAYS. OK. If you would raise your right hand, please?

[Witness sworn.]

Mr. SHAYS. Thank you. I welcome you here and am happy to have you make any statement you want.

STATEMENT OF ANNA JOHNSON-WINEGAR, DEPUTY ASSISTANT TO THE SECRETARY OF DEFENSE FOR CHEMICAL/BIOLOGICAL DEFENSE, DEPARTMENT OF DEFENSE

Ms. JOHNSON-WINEGAR. Thank you, Mr. Chairman and other members of the subcommittee for this opportunity to speak to you today.

Just a brief bit of history so that can put into context my relationship to the Chemical and Biological Defense Program. I am a career Government servant, having worked for the Department of Defense for over 30 years, and just moved into my position in October 1999.

I would like to talk just for a minute about what I think is an improved management structure in our Chemical and Biological Defense Program in response to guidance from the Congress and from within the Department.

As has been pointed out, Public Law 103–160 mandated that the Secretary of Defense identify a single office that would be responsible for chem/bio programs, and that is indeed my office. I would also like to acknowledge, as was pointed out before, that there has been considerable growth in the funding for the program, and we think that has been very successful in helping us to achieve some of our goals.

Before I go any further I would like to clarify what I think is a misperception on the part of this committee, and perhaps others, in that the DARPA program is not—I repeat, not—part of the Chemical and Biological Defense Program, as defined by the law, as covered in our annual report, and as covered in the budget figures that you have been quoted.

The DARPA expenditure for fiscal year 2000 is indeed $145 million, and you can compare that to our overall expenditure in the chem/bio core program, which is approximately $791 million.

As was pointed out by the GAO, we have indicated in our March 2000 report to Congress that we have taken the first steps toward implementing GPRA. I believe that it is important legislation and will help us to make a better assessment of our programs. We have identified a mission statement and have outlined goals which we hope will help us to achieve our program.

I would like to reiterate also that our program is a threat-driven program and is responsive to requirements that are developed for us. It is very easy to talk about the ultimate piece of equipment

that would help us be perfect; however, I think all of us are very well aware that science and technology does move in small increments, and I think I can honestly say that we have better equipment in the field today than we had at the time of the Gulf war. Some of those are, indeed, incremental improvements. We are, obviously, always on the lookout for that "great leap ahead." I think in some cases that's probably unrealistic.

I think that the quality of our program is measured in a number of different ways. We have outside review panels that help us to review our science and technology objectives. We look every year at the strategy of how we invest our funds. We develop an internal strategy guidance that helps us to shape our budget for the upcoming year, and we have to make hard choices in making decisions on how much money will be spent on procurement—that is, buying equipment for the forces in the field today—versus our investment in research and development, the long-term program.

I think all of you are probably aware that the threat is changing. There are new and emerging threats that demand that we invest some of our science and technology there, and we have to balance that with the amount of money that we have, how much we can spend on procurement, and how much is available for long-term investment.

I am very proud to be a part of the Chemical and Biological Defense Program. I think it is one of the shining stars in the Department of Defense. I think there has been a tremendous amount of increased interest in our program over the past few years, and I clearly think that the addition of a representative from the Joint Staff onto our OSD Steering Committee has provided that connection that we need with the warfighters. This year for the first time we had a video teleconference with representatives from the CINCs so that we could go over with them exactly what their requirements were and how our Chemical and Biological Defense Program is working to meet their requirements.

I would be happy to answer any questions you might have.

[The prepared statement of Ms. Johnson-Winegar follows:]

STATEMENT OF

ANNA JOHNSON-WINEGAR, PH.D.

DEPUTY ASSISTANT TO THE SECRETARY OF DEFENSE FOR CHEMICAL AND BIOLOGICAL DEFENSE

DOD CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM: MANAGEMENT AND OVERSIGHT

24 MAY 2000

FOR OFFICIAL USE ONLY
UNTIL RELEASED BY THE SUBCOMMITTEE
ON NATIONAL SECURITY, VETERANS AFFAIRS,
AND INTERNATIONAL AFFAIRS OF THE
HOUSE COMMITTEE ON GOVERNMENT REFORM

INTRODUCTION

Chairman and Distinguished Committee Members, I am honored to appear before your Committee today to address your questions regarding the management and oversight of the Department's Chemical and Biological Defense Program. I am Dr. Anna Johnson-Winegar, the Deputy Assistant to the Secretary of Defense for Chemical and Biological Defense.

As requested by the committee, I will address three topics: (1) how DoD's management structure coordinates and integrates the Services chemical and biological defense efforts, (2) specific responsibilities of all DoD agencies involved in the program, and (3) the strategic plan for highlighting performance and results rather than program activities and resources as required by the 1993 Government Performance and Results Act.

I. DoD Chemical and Biological Defense Program: Management and Coordination of Service Efforts

The National Defense Authorization Act for Fiscal Year 1994, Public Law No. 103-160, Section 1701 (50 USC 1522), mandates the coordination and integration of all Department of Defense chemical and biological (CB) defense programs. This law provides the essential authority to ensure the elimination of unnecessarily redundant programs, to focus funds on DoD and program priorities, and to enhance readiness. The continued support of Congress will ensure the successful implementation of the program.

Public Law 103-160 (Section 1701) directs the Secretary of Defense to take concrete management and oversight actions:

- Assign responsibility for overall coordination and integration of DoD chemical and biological defense (CBD) (non-medical and medical) research, development, and acquisition (RDA) programs to a single office within OSD.
- Exercise oversight of the programs through the defense acquisition board (DAB).
- Improve jointness of the program.
- Designate the army as executive agent for DoD to coordinate and integrate RDA programs of all Services.
- Submit funding requests for CBD RDA in the DoD budget as a separate account. Funding requests may not be included in the service budgets.
- Submit an annual report to congress concerning chemical and biological defense readiness and plans to improve the program.

The Department has successfully implemented all Public Law 103-160 (Sec. 1701) requirements. The implementation of the public law has provided the catalyst for major improvements in the Chemical/Biological Defense Program (CBDP); it has led to increased cost effectiveness, greater jointness, improved execution of the program, and more robust funding for chemical and biological defenses. With a consolidated management structure and continuing emphasis on joint requirements and joint developmental programs, the Department is fielding significant quantities of new and improved equipment.

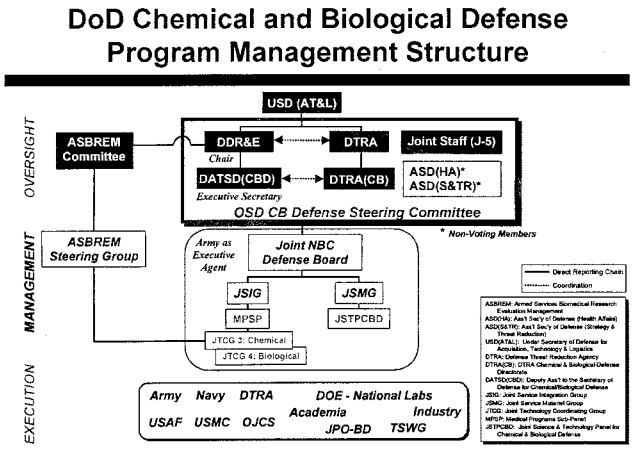
In my role as the Deputy Assistant to the Secretary of Defense for Chemical and Biological Defense — DATSD(CBD) — I serve as the focal point within the Department for the CBD Program. In this position, I am responsible for the oversight, coordination and integration of CB defense medical and non-medical acquisition efforts, and for providing the specific guidance for planning, programming, budgeting, and executing CB defense programs.

One of my responsibilities is to serve as the Executive Secretary for the Office of the Secretary of Defense (OSD) Chemical and Biological (CB) Defense Steering Committee. The OSD CB Defense Steering Committee provides direct oversight of the DoD Chemical and Biological Defense Program in accordance with Public Law 103-160. The CB Defense Steering Committee is composed of the following members (See also figure 1):

(1) Director, Defense Research and Engineering,
(2) Director, Defense Threat Reduction Agency (DTRA),
(3) Director, CB Defense Directorate, DTRA, (DTRA(CB)),
(4) Deputy Assistant to the Secretary of Defense for Chemical and Biological Defense,
(5) Joint Staff (J-5), Deputy Director for Strategy and Policy

In addition, the Assistant Secretary of Defense for Health Affairs and the Assistant Secretary of Defense for Strategy and Threat Reduction participate on the steering committee as non-voting members.

Figure 1.



The CB Defense Steering Committee is overseen by the Under Secretary of Defense for Acquisition, Technology & Logistics. The Steering Committee provides the fiscal and programming guidance to the Joint NBC Defense Board (JNBCDB) to develop the Program Objectives Memorandum (POM). The Joint NBC Defense Board forwards POM Preparation

Instructions to the subordinate groups, which review the validated requirements and build the POM strategy recommendations.

The CBDP is divided into six commodity areas, with each commodity area being managed by one of the Services in accordance with a Joint Service Agreement, as follows:

Commodity Area	Commodity Area Manager
Contamination avoidance	Army
Individual protection	Marines Corps
Collective protection	Navy
Decontamination	Air Force
Medical defense	Army
Modeling & Simulation	Navy

These commodity areas correspond to projects under the budget program elements. There is also a program budget element to support program management and oversight, user testing, and doctrine development in accordance with the Joint Service Agreement and in compliance with Public Law. The Joint Service Integration Group is the principal steering group that oversees the coordination and integration of Service and Commanders-in-Chief (CINCs) requirements and priorities for research, development, test & evaluation (RDT&E) and procurement. The Joint Service Materiel Group is the principal steering group that manages the execution of RDT&E materiel development efforts to ensure that program risk is mitigated across commodity areas, and the ongoing efforts are complementary but not duplicative.

A Medical Program Sub-Panel (MPSP) has been implemented as part of the Joint Service Integration Group. The MPSP is chaired by the Commander, Army Medical Department Center and School (AMEDDC&S). The purpose of the MPSP is to identify medical program needs and requirements as developed by the AMEDDC&S, CINCs, Services, Joint Staff, the Armed Services Biomedical Research Evaluation and Management (ASBREM) Committee, and other users. The MPSP coordinates, integrates, and prioritizes all user requirements input. It provides the consolidated, integrated, and prioritized list of medical CB defense requirements to the Joint Service Integration Group (JSIG). The JSIG then submits an integrated list of medical and non-medical requirements to the JNBCDB. The JSIG provides comments but makes no changes to the list when submitting the medical requirements to the JNBCDB. The JNBCDB and the OSD NBC Defense Steering Committee may make changes to the medical or the non-medical requirements and priorities list.

The Secretary of the Army is the Executive Agent responsible to coordinate, integrate, and review all Services' CB defense requirements and programs. The Secretary has delegated this responsibility to the Assistant Secretary of the Army for Acquisition, Logistics, and Technology, who along with the Vice Chief of Staff of the Army, co-chairs the Joint NBC Defense Board. The military departments' acquisition organizations execute the individual CB defense programs according to Service and DoD directives.

The Services have established procedures to ensure that individual Service-unique requirements are identified and integrated within a Joint framework for effective development

and acquisition of chemical and biological defenses. The Services' acquisition organizations manage individual CB defense efforts in accordance with Service and DoD Directives.

II. DoD Chemical and Biological Defense Program: The Role of Defense Agencies

In support of the DoD Chemical and Biological Defense Program, four defense agencies play key roles: (1) the Defense Threat Reduction Agency, (2) the Defense Advanced Research Projects Agency, (3) the Defense Logistics Agency, and (4) the Defense Intelligence Agency.

The 1997 Defense Reform Initiative established the Defense Threat Reduction Agency (DTRA). The management, direction and funds execution of the Chemical and Biological Defense Program were transferred to the Chemical/Biological Defense Directorate under DTRA, which plays a key role in the conduct of this program. As part of the management role, the Director, CB Defense Directorate within DTRA (DTRA/CB) serves as the chairman of the Joint Science and Technology Panel for Chemical and Biological Defense. In this role, he coordinates all Service science and technology base activities to ensure they respond to CINC and Service priorities for Joint Future Operational Capabilities. DTRA/CB also provides direction to the DTRA Comptroller, in conjunction with DATSD(CBD), for the execution of CBD funds.

DARPA is charged with seeking breakthrough concepts and technologies. DARPA's Biological Warfare Defense Program complements the DoD CB Defense Program by anticipating threats and developing novel defenses against them, and pursuing the development of technologies with broad applicability against classes of threats. DARPA invests primarily in the early, technology development phases of programs, with rapidly decreasing involvement in the succeeding stages that lead to system development. The CB Defense Program has programmed funding to facilitate the transition to acquisition of any demonstrated DARPA technologies that meet warfighter needs. DARPA is represented on the Joint Science and Technology Panel for Chemical and Biological Defense to ensure coordination of efforts. DARPA coordinates with the Chemical and Biological Defense Program through participation in the Technology Area Review and Assessment, which provides independent scientific review of technology base programs.

The Defense Logistics Agency (DLA) and the Army Materiel Command (AMC) are the item managers, or National Inventory Control Points, for the vast majority of chemical and biological defense items in all four Services. They are responsible for industrial base development, acquisition, and storage of wholesale peacetime and sustainment wartime stocks. They process procurement actions and, if requested, store chemical and biological defense materiel for the Services with funds provided by the Services. The Joint NBC Defense Board, through the Joint Service Materiel Group, provides coordination and integration based upon the input of all Services and CINCs. DLA and AMC will continue to provide services such as raw data collection, inventory control, and a distribution infrastructure. Consumable chemical and biological defense items are managed by the Services and the Defense Logistics Agency (DLA) in accordance with Title X responsibilities of the Services and their responsibility to manage their own operations and maintenance funds. Under the provisions of Title X of the FY95 Defense Authorization Act, Service Secretaries are responsible for, and have the authority to conduct, all affairs of their respective departments including supplying, training, and maintaining

equipment. For research, development, and acquisition programs, the existence of defense-wide (rather than Service-specific) funding accounts has ensured the joint integration of chemical and biological defense programs. In contrast, no defense-wide funding mechanism exists for the chemical and biological defense logistics area. Each Service must program and budget for the sustainment and acquisition of equipment funded through operations and maintenance (O&M) accounts. Because of this, the *joint* chemical and biological defense community is limited to tracking the status of DoD chemical and biological defense logistics readiness and sustainment program and making recommendations to correct funding shortfalls.

The Defense Intelligence Agency (DIA) provides the CBDP with continually updated reports and threat assessments tailored to the needs of our program. DIA coordinates with all DoD intelligence organizations and with organization throughout the intelligence community. The CBDP continues to be a threat-driven program, not technology-driven. The threat drives the user to identify requirements, and the capability needed, which in turn forms the basis for requirements for the RDA community. Threat reports provided by DIA assess the impact of weapons on how we fight. These assessment lead to requirements generated to meet user identified materiel shortcomings. Requirements in the form of Mission Needs Statements and Operational Requirement Documents are generated by the joint user community under the leadership of the Joint Service Integration Group. The result is that our programs and technologies are driven by validated threat assessments and user mission requirements, not by technologies.

III. DoD Chemical and Biological Defense Program: Strategic Plan

In its August 1999 report (NSIAD 99-159, 16 Aug 99), the General Accounting Office (GAO) recommended that a performance plan for the CB Defense Program should be developed and based on the outcome-oriented management principles embodied in the Government Performance and Results Act (GPRA). The initial response to this recommendation was provided in the introduction of the *DoD Chemical and Biological Defense Program Annual Report to Congress*, March 2000.

The introduction of this report outlines the broad mission, vision, values, and goals of the DoD CBDP. These statements provide linkage with the overall mission and vision of the Department of Defense and provide the framework for the development of a performance plan consistent with GPRA principles. To complete the performance plan, the CBDP is in the process of developing performance goals and performance measures. These goals and measures will be stated along with the development of the CBDP Program Strategy Guidance and incorporated into key planning, programming, and budgeting documents. A Performance Plan will be completed during calendar year 2000 and included in the next annual report to Congress.

Developing the correct performance measures is critical to the development of a successful performance plan. As GAO noted, it may take years to develop a sound set of performance measures (GAO-GGD-96-118, June 1996, p. 23.) Consequently, we view the performance plan as a living document that will be updated annually. The initial plan will focus on establishing explicit and outcome-oriented goals linked to warfighters' ability to survive, fight, and win in a

CB environment, and on identifying quantitative or qualitative performance measures that can be used to assess progress toward goal achievement.

The initial performance plan will be limited in scope to providing performance measures for research, development, and acquisition (RDA) programs. The scope will be limited to RDA programs because these are the programs for which the CBDP has direct oversight. Performance measures for RDA programs will supplement program management information on the cost, schedule, and technical performance. In the future, the performance plan will be expanded in scope to incorporate non-RDA CB defense activities that are critical to the success of U.S. forces. These additional activities may include: (1) operations and maintenance funds of the Services, which are used to support fielding and sustainment of selected chemical and biological defense equipment items, training, and doctrine development, and (2) DARPA Biological Warfare Defense research projects. In the future, the performance plans will improve by (1) providing the results of performance measures over time, (2) reviewing existing performance measures and developing improved or more appropriate measures and, (3) demonstrating the relationship between performance measures.

There will be a need for a variety of performance measures within the performance plan. No single measure in any one area may be adequate, and by itself a single performance measure may be uninformative and may be misleading. However, when the measures are viewed together over a period of time, the value of the measures as a management and oversight tool becomes apparent. Within the Chemical and Biological Defense Program, the performance plan may provide an effective management tool to measure — and hence manage — balance among the various areas. Following are areas within chemical and biological defense RDA which performance measure may demonstrate balance.

- Procurement (current force) *vs.* Advanced Development (near-term force) *vs.* Science and Technology (Next generation force).

  Sample performance measures:
  - Total funding within each budget area
  - Number of transitions (actual and planned)
  - For science and research programs: Independent expert review panel(s) of quality, relevance, accomplishments, and plans.

- *Systems integration*: Contamination avoidance *vs.* Protection *vs.* Force sustainment

  Sample performance measures:
  - Total funding within each commodity area
  - Number of systems fielded within each commodity area
  - Medical *vs.* non-medical programs
  - Detection & warning systems *vs.* individual protective ensembles

- Combined performance measures (using information from the above areas):

  Sample performance measures:
  - Current chemical detector *vs.* Future chemical detector — Comparison of characteristics:
    - Number/types of agents detected
    - Programmability for new agents
    - Detection sensitivity
    - False alarm (rates and causes)
    - Time to detect
    - Quantification of agent concentration
    - Size/weight/volume
    - Cost per unit
    - Ease of use
    - Communication/Alarm
    - Schedule/availability

Programs are in place to respond to user needs and shortfalls. Oversight and management of the DoD CB Defense Program continue to improve. Significant progress has been made in implementation of management initiatives required. The Department is on the right track for progress in fielding needed improved CB defense equipment to our forces. The continued support of Congress and implementation of current plans will continue to improve joint force readiness.

Mr. SHAYS. Do you have this document in front of you?

Ms. JOHNSON-WINEGAR. Yes, I believe I do.

Mr. SHAYS. Thank you.

I am looking at page 8.

Ms. JOHNSON-WINEGAR. Yes.

Mr. SHAYS. Maybe you could just kind of talk to me about that.

Ms. JOHNSON-WINEGAR. OK.

Mr. SHAYS. And discuss all the entities. I mean, I see DARPA there. We got it from you; I'm just curious how it fits in.

Ms. JOHNSON-WINEGAR. Certainly. I'd be happy to explain that to you.

The OSD Steering Committee, as shown in the blue box on the left, is comprised of five members. That's chaired by Hans Mark, the Director of Defense Research and Engineering. The other members are Jay Davis, the Director of DTRA; Dr. Gary Resnick, who is Director of the Chemical/Biological Directorate at DTRA; myself; and Admiral Costello, representing the Joint Staff. And I think, as I mentioned before, that that's been a very important addition.

We have a representative from OSD Policy, Strategy and Threat Reduction as a non-voting member, and this is the group that annually puts out the guidance for the Chemical and Biological Defense Program as we develop our budgets and our programs for the upcoming years.

What this chart is meant to show, with the DARPA interaction—and you'll see that on the right-hand side of the chart—is that the DARPA organization also reports to Hans Mark. They develop their budget entirely separately, and DARPA has been investing in the area of bio defense for the past few years, and has had a rapid growth in their program, also.

You will see that the area where the programs meet and "marry up" is in sort of a pale oval in the center, where representatives from DARPA meet with service representatives, representatives from DTRA, and talk about their investment in the science and technology part of the program.

We have taken an additional step in that we have identified specific transition funding. As I know you are aware, DARPA invests in basic research and a little bit of applied research, but does not have the mandate nor the wherewithal to carry programs through. We have set aside special funding so that when DARPA is finished with their investment, we can continue the advanced development and further evaluation. For example, in the area of medical products, DARPA does not have the resources or the personnel to take things from basic research into the required kinds of pre-clinical animal studies, and ultimately into clinical trials. And that's where our programs are going to marry up.

Mr. SHAYS. I have a philosophy in my office, that when I say "Who's handling this, who's in charge," and three hands go up, I know no one is in charge. So I always, always make sure one person is in charge.

Now, my sense of your responsibility is that you are basically in charge of the Chemical and Biological Defense Program; I mean, that's your responsibility.

Ms. JOHNSON-WINEGAR. Yes.

Mr. SHAYS. So for you to tell me that somehow DARPA is not really involved is not clear to me. I don't understand your opening statement; in fact, I wasn't even ready to go in that direction, but you seemed to really want to make that point.

Ms. JOHNSON-WINEGAR. Yes.

Mr. SHAYS. You put it on the table.

Ms. JOHNSON-WINEGAR. Yes, I did, and I did that deliberately.

The point that I want to make is that DARPA develops their own budget——

Mr. SHAYS. I'd like you to restate what you stated in the beginning. Maybe I misunderstood you. What was your point when you started?

Ms. JOHNSON-WINEGAR. That the Chemical and Biological Defense Program, as defined by Public Law 103–160, and as reported in our annual report, does not cover the investment made by DARPA. That is not to say that we don't coordinate our programs with DARPA——

Mr. SHAYS. Well, aren't there a lot of things that are done that don't come directly under you, that are related to chemical and biological?

Ms. JOHNSON-WINEGAR. That's correct, but——

Mr. SHAYS. Isn't your job to coordinate it?

Ms. JOHNSON-WINEGAR. To the best of my ability, if I do that, yes.

Mr. SHAYS. I don't know what you mean by "to the best of your abilities."

Ms. JOHNSON-WINEGAR. I think the differentiation that I'm trying to make is on the money, because it is a significant investment from DARPA. And these other programs, TSWG program and some of the other ones, are relatively small and pale in comparison to the DARPA investment.

Mr. SHAYS. So what you're telling me is that you're going to focus on the small stuff, and the big stuff is out of your reach?

Ms. JOHNSON-WINEGAR. No, sir, that's not what I'm saying at all.

I do have responsibility for coordinating the Department's Chemical and Biological Defense Programs.

Mr. SHAYS. That's clear to me.

Ms. JOHNSON-WINEGAR. That's clear, yes.

Mr. SHAYS. OK. And so that does not include DARPA, as a coordinating effort?

Ms. JOHNSON-WINEGAR. It does include DARPA as a coordinating effort. It does not mean that I provide any direct management of the DARPA programs. So perhaps I'm making a——

Mr. SHAYS. But that's true for all the other things you coordinate, isn't it? There are other parts within DOD that you don't have their budget, and it's not part of your $791 million, but your job is to bring all these disparate groups together so that we have a coordinated effort?

Ms. JOHNSON-WINEGAR. Yes.

Mr. SHAYS. OK. So, I'm sorry, I don't get your point.

Ms. JOHNSON-WINEGAR. Well, the point, as was made by the GAO, is that there are three organizations that are primarily conducting the work of the Chemical and Biological Defense Program——

Mr. SHAYS. Right.

Ms. JOHNSON-WINEGAR [continuing]. And they identified SBCCOM, DARPA, and the JPO for Biological Defense, and made a very distinct point of saying that DARPA was excluded from having GPRA apply to them, and had been granted an exception by the Defense Executive Management Council.

Mr. SHAYS. Right. I heard them say that.

Ms. JOHNSON-WINEGAR. And that's the point I was trying to make. While DARPA may have been excluded from GPRA, I do not feel that the rest of the Chemical and Biological Defense Program falls under that same analysis, and we certainly do intend to comply. I just want to make it perfectly clear that if DARPA has already been excluded, I don't know if I can then enforce a GPRA evaluation on top of them.

Mr. SHAYS. OK. That's a different—if that were true—I don't know if I would agree with that, but let me let my colleagues—let me think about what you said so that I don't come to a rash judgment here, and then we'll go on.

Mr. Blagojevich.

Mr. BLAGOJEVICH. No questions, Mr. Chairman.

Mr. SHAYS. Mr. Tierney.

Mr. TIERNEY. Nothing, Mr. Chairman.

Mr. SHAYS. What I really want to have is a sense of what you think the GAO report was saying, and how you respond to what GAO was saying. And I don't mean to rush you, but I don't want to dig other holes; I'd just like to know in general what your view is.

I'll tell you my view, to start with. My view is that you have a very important task, that chemical and biological threats are serious, and that DOD has not done it in an effective and coordinated way, and that we end up wasting extraordinary resources and we don't get the job done in the way that it needs to get done. And I think, as a result, our men and women in the armed forces are vulnerable.

I will tell you that I come with some anger about this aspect, and that is that I have been aware of the vulnerability of our military and could share it with no one because it was classified at the time. And I took some comfort in knowing that your office had been established to start to begin to do a better job.

It may be that we have a hearing on DARPA and we get a better sense of that element, the sense that somehow they didn't come under the Results Act, because if anyone needs it, they need it. And I will say further that I don't think any of what we're talking about is all that technical; it's just basic, common-sense kind of approach to know what we want to do and how we're going to do it. We want to know why we want to do it.

So I'd like to ask you how you react to what the GAO report has said, and I will say to you as well that I think they were rather gentle. I don't think that they tore your agency apart; they may have been tempted to, but I think they were rather gentle in their assessment, rather matter-of-fact. They were just saying that "you're not doing it, and I'd like to help you do it," and I want to know what you want to do.

Ms. JOHNSON-WINEGAR. Well, first of all let me say that I absolutely agree with you. I, too, am concerned about the vulnerability of our forces. As I said in my opening comments, I've been involved in the Chemical and Biological Defense Program for essentially my entire career, and have made an effort to do what I can and to make what contributions I can to getting us past that hurdle of our forces being vulnerable.

So I do take very seriously the mission and the mandate of our program.

I appreciate the comments that you've provided and having had the opportunity to review the GAO report, I certainly think there will be some additional value added to our program if we can apply metrics so that we can come up with quantitative measures of how we're doing.

I think we do have some good examples. I know you don't want to go into a lot of detail today about these types of things, but we can look at improvements in the program in a number of different ways, and you have those briefing charts in front of you that we have provided before that show where we were in 1990, at the time of the Gulf war, where we are today, and where we plan to go in the future.

While some of those things at the present may be subjective—for example, we need detectors that can identify more agents, or we need to be able to detect things at a lower level of sensitivity, or we need to be able to do it faster—these are all driven by the requirements, as was mentioned before. The requirements address the threat; as the threat changes, we need to be able to respond to that; and as the requirements documents are written, we need to develop a material solution to fix that requirement. It may not always be the perfect requirement, and sometimes that is an iterative process, and sometimes we field interim pieces of equipment. When the BIDS was first deployed, it could detect four biological agents. Then it was eight, and the goals continue to increase.

So if those are some of the types of measures and metrics on how well our program is performing and how valuable our investment is going to be, I certainly welcome and look forward to those types of evaluations and assessments.

Mr. SHAYS. Who is in charge of CBDP? Is it Dr. Gansler, the Under Secretary of Defense for Acquisition, Technology and Logistics? Dr. Mark, the Director of Defense Research and Engineering? The Steering Committee? Or you?

Ms. JOHNSON-WINEGAR. On a day-to-day basis, my office is the office that is responsible for the Chemical and Biological Defense Program. I do, of course, have bosses in the Pentagon, and report up the chain to both Dr. Mark and Dr. Gansler, and ultimately to the Secretary and Deputy Secretary.

Mr. SHAYS. What authority do you have as the focal point of the program?

Ms. JOHNSON-WINEGAR. My authority is to provide the oversight and management to the elements of the program that are executing the various phases of the program, and to serve as the senior staff to the Secretary and to Dr. Gansler for all issues related to Chemical and Biological Defense Programs.

Mr. SHAYS. OK. Agents, you said?

Ms. JOHNSON-WINEGAR. Agencies.

Mr. SHAYS. All agencies. Is DARPA one of them?

Ms. JOHNSON-WINEGAR. Yes, it is.

Mr. SHAYS. OK. And do they know that?

Ms. JOHNSON-WINEGAR. I believe they do.

Mr. SHAYS. What additional authority do you need?

Ms. JOHNSON-WINEGAR. I'm not sure I understand exactly what you mean.

Mr. SHAYS. In other words, in my work I find that some people are responsive and some aren't. When, for instance, we were looking at—my previous committee was looking at the Gulf war illnesses, I found the Department of Veterans Affairs very responsive, because I had direct oversight over them. I found DOD not as responsive, and it is the very reason why I changed committee assignments. So I now chair this committee, and have DOD responsive to me.

Do you have any feeling that when you do your work, you aren't getting a quick response from the various agencies within DOD? Or do you feel you are getting all the response you need? Is there anyone out of the loop?

Ms. JOHNSON-WINEGAR. I would certainly say that in the approximately 6 months or so that I have been in the job, I certainly see a tremendous improvement in responsiveness and cooperation among the various agencies. I am not attributing that to me personally, but I think it is to the general——

Mr. SHAYS. Which agency is the least responsive?

Ms. JOHNSON-WINEGAR. Well, it varies on a given issue, what the particular problem might be.

Mr. SHAYS. Would you describe your coordinating effort as "herding cattle" or "herding cats?"

Ms. JOHNSON-WINEGAR. Probably somewhere in between.

Mr. SHAYS. OK. Well, we'd like it to be cattle.

Would you like to get to the chart?

Mr. HALLORAN. Before I get to the chart, what does the JPO, the Joint Program Office, do that SBCCOM doesn't?

Ms. JOHNSON-WINEGAR. The Joint Program Office has responsibility for the 6–4, 6–5, advanced development, and the procurement aspects. They work very closely with SBCCOM; as a matter of fact, some of the particular program managers for specific items reside at SBCCOM and are essentially matrix-managed to the Joint Program Manager.

Mr. HALLORAN. So does that suggest some redundancy? Must they be unique?

Ms. JOHNSON-WINEGAR. The JPO?

Mr. HALLORAN. Yes.

Ms. JOHNSON-WINEGAR. They were specifically created, as you know, to bring focus and attention to bio defense only. They don't do any work on the chemical side. But bio defense, again, in the areas of advanced development and procurement, so that they could bring about a synergism between the medical and the nonmedical aspects of bio defense, and provide a focal point, again, for the attention needed to bring many of these bio systems to full fielding.

Mr. HALLORAN. I understand what the chart says, but is there a unique bio threat? My understanding was that the battlefield threat was both, or a combination, that we need to prepare for both. Well, the JPO may have been a nice idea; is it still relevant?

Ms. JOHNSON-WINEGAR. Well, it's certainly my assessment, and I'm not an intelligence analyst or threat assessor by trade, but it's certainly my assessment that the bio threat is a much larger threat for us today than it has been in the past, for a number of reasons: the diversity of the number of agents there; the relative ease in producing them; and the fact that I think we have better defenses against the chemical threat, certainly the traditional chemical threat, than we do for the bio threat.

Mr. HALLORAN. Turning to page 14 of your briefing slide presentation, you see the defense deficiencies identified in Operation Desert Storm. I would like to address an issue raised by Dr. Harris, which is that you identify goals, near-term and long-term goals, in each commodity area, each of these areas.

I wonder if you could give us a sense of, given those goals, the tradeoffs that are involved here, or the impacts that one might have on the other. That is, for example, if you made a breakthrough in standoff detection and you had the capability to identify specifically agents at some specific and tactically significant distance, would that change your goals in terms of protection or medical intervention or some other element down the line? Or would they all just proceed apace without impacting each other?

Ms. JOHNSON-WINEGAR. Well, clearly they are interrelated, and as we make improvements and advances in one area, that will allow us, hopefully, to decrease our investment or focus our energies elsewhere. If we had the one universal solution to the problem, we could collapse our various investment areas.

These are not just arbitrary commodity areas or investments. They are things that are well thought-out. And I think you can find examples of interaction between the groups as we go forward now. So you are absolutely right; if we improve our capability for standoff detection, then that makes an impact on what we would need for some of the other aspects of the program. That's why it is an iterative process and evaluated on an annual basis, both from the science and technology side of things, where we are investing in what new programs and products are coming along that will be ready for transition, and we balance that with what we have in the field today.

Mr. HALLORAN. Again, in the absence of any specific goals, how would you know when to make a tradeoff? How would you know you had achieved sufficient capacity—in detection, for example—to allow you to back off a requirement in either individual or collective protection?

Ms. JOHNSON-WINEGAR. Well, again, those are program management decisions that are impacted by all the traditional factors that program managers use, cost schedule and performance. And as we see one particular approach either being very successful or not being very successful, we can make adjustments to our investment accordingly.

Mr. HALLORAN. I notice in your report you describe DARPA as focused particularly on broad-range or multiagent defense capabili-

ties. Where do I find that focus in here? As you know, coming out of the Anthrax vaccine, there is an agent-specific intervention.

Ms. JOHNSON-WINEGAR. Yes.

Mr. HALLORAN. Is that a priority goal in here someplace, in your program——

Ms. JOHNSON-WINEGAR. Yes.

Mr. HALLORAN [continuing]. General protection versus specific?

Ms. JOHNSON-WINEGAR. Yes. You will see a couple of Defense technology objectives that look at a multivalent vaccine, for one, and also in the area of detectors, they are what I would call not agent-specific, but more generic, and we are investing in technologies that will help us identify classes of agents rather than specific agents.

So you will find that primarily in the R&D section of the program. We don't have anything fielded right now that I would call a generic detector or a generic solution, other than that you could apply that type of logic to things like the masks and the suits which protect, presumably, against all the known threats.

Mr. HALLORAN. That we know now?

Ms. JOHNSON-WINEGAR. Right.

Mr. HALLORAN. Where in the organizational charts provided here—you mentioned technology objectives. Where are they developed, and what is your role in that?

Ms. JOHNSON-WINEGAR. The Defense technology objectives are developed by the performers, the people that are doing the science and technology work in the laboratories. They propose them on an annual basis.

Mr. HALLORAN. Who are they?

Ms. JOHNSON-WINEGAR. Who are the laboratories?

Mr. HALLORAN. Yes.

Ms. JOHNSON-WINEGAR. Well, for example, SBCCOM is one. The Navy, the Marines, the Army Medical Command. Any of them can propose a certain segment of their work to have it identified as a Defense technology objective, and with that comes a certain set of criteria. And they do have measurable goals. And I think that's one area in which our program is attempting to comply with GPRA, in that when we identify something as a Defense technology objective, we have a timeline—this work will be completed by a certain time; we have identified the budget—this is how much money we are going to invest in that; and we have what are called "exit criteria." At the end of this particular piece of work we will have enough science and technology to be able to say that it will do thus-and-such, it will identify things, it will neutralize things, it will stop things, whatever the specific criteria might be.

Mr. HALLORAN. Who makes that determination? Is it TSWG, or where is that?

Ms. JOHNSON-WINEGAR. On the DTOs?

Mr. HALLORAN. Yes.

Ms. JOHNSON-WINEGAR. That's done across the Department of Defense, and chem-bio is just 1 of 12 science and technology areas. Those are cumulatively found in a separate document called "Defense Technology Objectives" of which there are over 300 now. We have approximately 20 or so in the chem-bio defense area. And there is a separate document that addresses all those; I would be

happy to provide you either a copy of that, or information where it is available on the Web.

Mr. HALLORAN. OK. I'd like to see just your 20.

Ms. JOHNSON-WINEGAR. OK.

[The information referred to follows:]

HNSC/SASC SAMPLE

INSERT FOR THE RECORD
HOUSE COMMITTEE ON GOVERNMENT REFORM
SUBCOMMITTEE ON NATIONAL SECURITY, VETERANS AFFAIRS AND INTERNATIONAL RELATIONS
DOD CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM: MANAGEMENT AND OVERSIGHT
WEDNESDAY, MAY 24, 2000

PAGE NUMBER 44 /LINE NUMBER 1009

DEFENSE TECHNOLOGY OBJECTIVES (DTO'S) RELATED TO THE CHEMICAL BIOLOGICAL DEFENSE AREA

The information follows:

Attached is the information requested by Mr. Halloran of the Subcommittee concerning the Defense Technology Objectives (DTOs) related to the chem-bio defense area.

Chemical/Biological Defense
Defense Technology Objectives

I.02 Joint Biological Remote Early Warning System ACTD.
CB.06 Advanced Lightweight Chemical Protection
CB.07 Laser Standoff Chemical Detection Technology
CB.08 Advanced Adsorbents for Protection Applications
CB.09 Enzymatic Decontamination
CB.19 Chemical Imaging Sensor
CB.20 Biological Sample Preparation System for Biological Identification
CB.22 Medical Countermeasures for Vesicant Agents
CB.23 Medical Countermeasures for Staphylococcal Enterotoxin B
CB.24 Medical Countermeasures for Encephalitis Viruses
CB.25 Multiagent Vaccines for Biological Threat Agents
CB.26 Common Diagnostic Systems for Biological Threats and Endemic Infectious Diseases
CB.27 Therapeutics Based on Common Mechanisms of Pathogenesis
CB.28 Chemical Agent Prophylaxes II
CB.29 Reactive Topical Skin Protectant

Combating Terrorism
Defense Technology Objectives

L.07 Terrorist Chemical/Biological Countermeasures.
L.12 Force Medical Protection/Dosimeter ACTD

I.02 *Joint Biological Remote Early Warning System ACTD.*

Objectives. Evaluate the military utility of remote early warning for biological warfare (BW) attacks against U.S. forces, and develop the operational procedures and doctrine associated with that capability. An additional objective is to provide the CINCs with an interim residual capability to detect and provide automated warning and reporting to promptly alert only those forces that may be exposed to BW agents. The ACTD will leverage advanced biological detection technologies (e.g., UV laser particle sizer, immunoassay fiber-optic wave guide) from the DoD counterproliferation initiative and technology base community. The ACTD will demonstrate several remote early warning platforms, man-emplaced detectors, and standoff active laser detectors. All of the remote detectors will be connected to a warning and reporting system that enables the CINC to promptly (in less than 15 minutes) alert forces who are downwind of BW agents. Extensive simulation will be conducted in parallel to evaluate the operational utility of the remote early warning system for employment during early entry, buildup, defensive, offensive, and consolidation phases. Preliminary modeling of BW attack against U.S. forces during a proposed buildup phase shows that an early warning system could reduce casualties by up to 95%.

Payoffs. In FY99, the system demonstrated in CONUS networked (Joint Warning and Reporting Network (JWARN)) remote early warning systems against point and long-line source BW attacks. Data fusion of remote detectors into a JWARN is the key to providing early warning of potential BW attacks; this capability may eliminate nearly all (95%) casualties from a biological attack.

Challenges. Technical barriers include the demonstration of a UV particle sizer, sufficiently miniaturized detection technologies, and effective active laser biodetection technology. Demonstration of a simulation capability for operational use is needed that enhances warning and reporting capabilities.

Milestones/Metrics.

FY2000: Provide the CINCs with an interim residual capability to detect and provide automated warning and reporting to promptly alert only those forces that may be exposed to BW agents. Conduct military utility assessment. Conduct unit training. Deliver residual assets. Commence interim capability support.

FY2001: Provide sustainment of demonstrated equipment at selected locations for operational use. Conclude interim capability support.

Customer POC	Service/Agency POC	USD(AT&L) POC
LTC Ken MANFRA, USA	Mr. Brian J. DAVID	Dr. Anna JOHNSON-WINEGAR
HQ PACOM/STA	JPO/BD	DATSD(CBD)
LTC Robert C. NEUMANN, USA		Dr. Laura PARKER
USEUCOM		DUSD/AS&C
Lt Col Mike URBAN, USAF		
CENTCOM		

I.02 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY00	FY01	FY02	FY03	FY04	FY05
0603750D	P523	2.6	3.8	0.0	0.0	0.0	0.0
	DTO Total	**2.6**	**3.8**	**0.0**	**0.0**	**0.0**	**0.0**

I.02 Non-S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY00	FY01	FY02	FY03	FY04	FY05
0603884BP	CP4	4.7	4.4	0.0	0.0	0.0	0.0
	DTO Total	**4.7**	**4.4**	**0.0**	**0.0**	**0.0**	**0.0**

CB.06 ***Advanced Lightweight Chemical Protection.***

Objectives. Develop and demonstrate materials for a new generation of lightweight chemical/biological (CB) protective clothing ensembles based on selectively permeable membrane technology that will eliminate or reduce the use of carbon in CB clothing. The resulting advanced material system will be 30% lighter in weight than the battle dress overgarment material system, allow selective permeation of moisture while preventing the passage of common vesicant agents, provide protection against penetration by toxic agents in aerosolized form, and provide at least the current level of protection against toxic vapors and liquids. The ultimate objective will be to demonstrate a CB protective garment that replaces the standard duty uniform.

Payoffs. This DTO will reduce the logistics burden as a result of improved launderability, lighter weight, and reduced volume (less bulky); and significantly improve performance while in a mission-oriented protective posture as a result of significantly reduced thermal stress and bulk of uniform. Ultimately, incorporation of CB protection into standard duty uniform will provide continuous protection. This DTO supports Land Warrior, Air Warrior, Mounted Warrior, Joint Service Lightweight Integrated Suit Technology (JSLIST) P3I, Advanced Development Clothing and Equipment, and Engineering Development Clothing and Equipment. In FY99, this DTO demonstrated material durability. Advanced membranes with lightweight shell fabrics and novel closure systems were integrated into a lightweight CB duty uniform concept. The CB duty uniform is launderable, 30% lighter in weight, and less bulky than the JSLIST duty uniform/ overgarment system, with equivalent durability, reduced logistics burden, and lower cost.

Challenges. The key technical challenge is the development of selectively permeable membranes suitable for all battlefield applications. Closure concepts and material that provide maximum protection must also be improved.

Milestones/Metrics.

FY2000: Fabricate and demonstrate a lightweight CB duty uniform that is 30% lighter with the same or better protection.

Customer POC	Service/Agency POC	USD(AT&L) POC
CPT Jon CARROLL, USA USAIC	Dr. Gary RESNICK SBCCOM/TPCBD	Dr. Anna JOHNSON-WINEGAR DATSD(CBD)

CB.06 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY00	FY01	FY02	FY03	FY04	FY05
0602384BP	CB2	0.6	0.0	0.0	0.0	0.0	0.0
	DTO Total	**0.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

CB.07 ***Laser Standoff Chemical Detection Technology.***

Objectives. Provide a standoff laser integrated chemical and bioaerosol detection capability for protection of fixed sites, reconnaissance, and other battlefield applications.

Payoffs. Demonstrate capabilities in field testing with sufficient laser power and detector sensitivity to detect agents at a distance of 20 km (a 400% increase from the FY96 baseline), evaluate sensitivity for "dusty" chemical agent detection, and enhance protection at fixed sites against CB agents. This DTO supports Joint Service Chemical Warning and Identification LIDAR Detector, Joint Service Nuclear/Biological/Chemical (NBC) Reconnaissance System, and Airbase and Shipboard Chemical and Biological Defense. In FY99, a brassboard build for a multipurpose detector was initiated.

Challenges. Demonstration of the existing laser standoff chemical detector (LSCD) in all joint service scenarios requires expansion of current azimuth and elevation scanning limits (low risk) and enhanced information display (low risk). Minimization of system response time will require upgrading to a real-time algorithm or display (low-to-moderate risk). Maximization of system ranges will require upgrading to a larger telescope (low risk) and higher-energy, tunable CO2 laser (moderate risk). Although a laser having the exact specifications for this application has not yet been developed, recent experiments indicate that there are at least three viable laser architectures suitable for development. The feasibility of adding improved mustard detection capabilities depends on developing and demonstrating 8-μm laser technology (high risk). The feasibility of adding dusty agent detection capabilities requires the characterization of optical properties of such particles (low-to-moderate risk) and modeling of LIDAR performance (low risk). In addition, substantiation of the theoretical analysis on dusty agent detection capabilities depends on the generation and testing of an appropriate simulant (moderate risk).

Milestones/Metrics.

FY2000: Demonstrate brassboard capabilities in field testing with sufficient laser power and detector sensitivity to detect chemical and biological agents at a distance of 20 km (a 400% increase from the FY96 baseline); evaluate sensitivity for dusty chemical agent detection.

Customer POC	Service/Agency POC	USD(AT&L) POC
LTC Mike LANPHERE, USA JSIG	Dr. Gary RESNICK SBCCOM/TPCBD	Dr. Anna JOHNSON-WINEGAR DATSD(CBD)
COL Stephen V. REEVES, USA NBC Defense Systems		

CB.07 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY00	FY01	FY02	FY03	FY04	FY05
0602384BP	CB2	0.0	0.0	0.0	0.0	0.0	0.0
0603384BP	CB3	5.4	0.0	0.0	0.0	0.0	0.0
	DTO Total	**5.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

CB.08 ***Advanced Adsorbents for Protection Applications.***

Objectives. Develop advanced adsorbent bed compositions (e.g., layered adsorbents) to enhance the chemical agent filtration capabilities of current single-pass filters as well as regenerative filtration systems under development.

Payoffs. Advanced adsorbent bed compositions for use in nuclear/biological/chemical (NBC) filters will result in smaller, lighter-weight filtration systems with reduced logistical requirements, improved protection against toxic industrial materials (TIMs), and reduced combustibility. Smaller, lighter-weight filters are especially desirable to address respirator needs for (1) improved face seal (less filter weight improves mask-to-face bond), and (2) improved weapons sighting (reduced filter size improves man-to-weapon interface). Development of noncombustible adsorbent beds is desirable to eliminate the possibility of a filter fire in the event of overheating resulting from malfunctioning of system components. In FY99, adsorbent materials and combinations of materials exhibiting the desired properties and performance were prepared. An agent sorption assessment was initiated.

Challenges. For single-pass filters, adsorbent beds that improve kinetics of agent removal are needed to address the goal of smaller, lighter-weight filters. For regenerable filters, adsorbent beds that readily release adsorbed agent during the purge cycle are needed to minimize size and energy requirements. The identification of noncombustible adsorbents with high levels of agent removal at all humidity conditions has proven to be an especially difficult challenge. Adsorbent bed compositions need to address recent drafted requirement documents for NBC protection systems (e.g., JSGPM, JTCOPS), including capability for protection against TIMs, which is not adequately provided by current NBC filters.

Milestones/Metrics.

FY2000: Adsorption equilibrium correlation to be developed so that predictions of equilibria are available for formulation of adsorbent bed compositions. Identify additional bed formulations to address competitive adsorptive effects of water adsorption and retention of high-vapor-pressure agent/TIMs for regenerative applications. Optimize the performance to minimize water adsorption and maximize adsorption capacity for high-vapor-pressure agents/TIMs.

FY2001: Select the best adsorbent bed composition for protective mask applications against agents/TIMs.

FY2002: Select the best adsorbent bed composition for single-pass collective protection applications against agent/TIMs.

FY2003: Select the best adsorbent bed composition for regenerative filtration applications against agent/TIMs. Conduct qualification testing to verify the performance expected in host filter systems against agent/TIMs.

Customer POC	Service/Agency POC	USD(AT&L) POC
Mr. Roger LABATAILLE PEO/GSI	Dr. Gary RESNICK SBCCOM/TPCBD	Dr. Anna JOHNSON-WINEGAR DATSD(CBD)
COL Stephen V. REEVES, USA NBC Defense Systems		

CB.08 S&T Funding

(Dollar Amounts in Millions)

PE	Project	FY00	FY01	FY02	FY03	FY04	FY05
0602384BP	CB2	0.9	1.1	1.2	1.1	0.0	0.0
	DTO Total	**0.9**	**1.1**	**1.2**	**1.1**	**0.0**	**0.0**

CB.09 *Enzymatic Decontamination.*

Objectives. Develop and demonstrate a new generation of enzyme-based decontaminants that are nontoxic, noncorrosive, environmentally safe, and lightweight (freeze-dried concentrate).

Payoffs. Enzyme-based systems have the potential to reduce the logistical burden by 50- to 100-fold. High-activity G-agent enzymes have been identified, characterized, and demonstrated to be effective in NATO-sponsored agent trials. Several V-agent enzymes and H-agent reactive polymers have been identified, but their activity will need to be improved. Enzyme-based materials may also have applications in some nonaqueous systems (sorbent, sensitive equipment decontamination). In FY99, enzymes for V- and H-agents were evaluated. Reactive polymers and other materials for enhanced H-agent hydrolysis/oxidation and compatibility with nerve agent enzymes were also evaluated.

Challenges. The major technical challenge is to identify appropriate enzymes and enzyme-compatible chemicals that are (1) reactive with all nerve and blister agents; (2) genetically engineered for large-scale production; and (3) nontoxic, noncorrosive, and environmentally safe.

Milestones/Metrics.

FY2000: Select the best candidate V- and H-agent enzymes and use molecular biology techniques to facilitate their production. Optimize use of reactive materials for H-agent hydrolysis/oxidation in enzyme-based decontaminants.

FY2001: Produce sufficient V- and H-agent enzymes and reactive materials to optimize their use in foams, detergent solutions, or other types of dispersion systems.

FY2002: Demonstrate the efficacy and stability of enzyme/chemical decontamination systems for G-, H-, and V-type agents in foams, detergent solutions, or other types of dispersions systems.

Customer POC	Service/Agency POC	USD(AT&L) POC
COL Leonard A. IZZO, USA USACS	Dr. Gary RESNICK SBCCOM/TPCBD	Dr. Anna JOHNSON-WINEGAR DATSD(CBD)
LTC Mike LANPHERE, USA JSIG		

CB.09 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY00	FY01	FY02	FY03	FY04	FY05
0602384BP	CB2	0.8	0.8	0.9	0.0	0.0	0.0
	DTO Total	**0.8**	**0.8**	**0.9**	**0.0**	**0.0**	**0.0**

CB.19 *Chemical Imaging Sensor.*

Objectives. Demonstrate a lightweight, wide-area, passive standoff imaging detection system capable of rapidly detecting chemical agent vapors for the purpose of contamination avoidance, reconnaissance, and facilities evaluation. The final system will operate at 360 Hz with a 256 x 256 focal plane array (FPA), and is scheduled for transition to development in FY03. This DTO will focus on development of ultra-high-speed interferometers, integration of off-the-shelf FPAs, and development of a signal processing algorithm.

Payoffs. The chemical imaging sensor (CIS) will allow rapid evaluation of large areas for chemical warfare (CW) contamination, and provide detailed information as to the position of a CW agent cloud. Current single-pixel designs have an extremely limited field of view (typically 26 m at a distance of 1 km). In addition, they cannot scan at sufficient speeds for proposed high-speed applications (i.e., tactical helicopter, high-speed aircraft, and hemispherical scanning applications). The CIS will be capable of operating at fields of view at least 250 times greater than current systems. In addition, scan speeds will be increased by almost two orders of magnitude for extremely high-speed applications. The potential deployments include fixed sites, ground vehicles, unmanned aerial vehicles, helicopters, high and low aircraft, and even low-Earth-orbit configurations. In FY99, real-time operation at 30 Hz was demonstrated.

Challenges. Proposed deployment of the CIS includes many ground and airborne scenarios that require high-speed operation. Speeds of at least 360 scans per second are required in many airborne operations in order not to "blur" the data. A significant effort is required to run an imaging spectrometer at these high speeds. The proposed spectrometer will contain (at the least) a low-density array of 9 to 16 pixels with higher density arrays being incorporated as they become available. The most significant current challenges are signal processing hardware and software, high-density FPA development, and high-speed interferometry. Commercially available interferometers typically operate at a few scans per second, with ten being a typical number. A CIS operating at 360 Hz with a 256 x 256 FPA will require about 1 TFLOP of computing power. Extrapolating current speed increases of high-speed computers into future signal processing hardware that can handle the CIS is expected to be available commercially in about 5 years.

Milestones/Metrics.

FY2000: Demonstrate 16-pixel spectrometer at 100 Hz (offline processing of data).

FY2001: Demonstrate real-time operation at 100 Hz.

FY2002: Demonstrate 16-pixel spectrometer at 360 Hz.

Customer POC	Service/Agency POC	USD(AT&L) POC
LTC Mike LANPHERE, USA JSIG	Dr. Gary RESNICK SBCCOM/TPCBD	Dr. Anna JOHNSON-WINEGAR DATSD(CBD)
COL Stephen V. REEVES, USA NBC Defense Systems		

CB.19 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY00	FY01	FY02	FY03	FY04	FY05
0602384BP	CB2	2.1	2.2	2.4	0.0	0.0	0.0
	DTO Total	**2.1**	**2.2**	**2.4**	**0.0**	**0.0**	**0.0**

CB.20 ***Biological Sample Preparation System for Biological Identification.***

Objectives. Develop and demonstrate by 2001 an advanced Biological Sample Preparation System (BSPS) for incorporation with leading-edge biological identification technologies. The advanced BSPS will be compatible with an array of agents of biological origin (ABO) identification approaches under development for next-generation field biodetection systems, and represents an essential enabling technology for the success of these systems. The final product of this effort is intended to transition to Joint Biological Point Detection System Block II.

Payoffs. When incorporated with advanced biological identification technologies, the technology being developed will expand the scope of detectable and identifiable ABOs, shorten the time required for sample analysis, ensure that a maximum and properly prepared sample load is analyzed, and reduce the associated logistics burden as well as overall footprint. The development of these technologies, along with concurrent advances in biological identification systems, will permit more rapid and reliable response at a lower overall implementation investment to biological threats on the battlefield, as well as in applications related to domestic preparedness, intelligence gathering, and treaty verification issues. In FY99, methodologies to reduce time for disruption of spores and viral particles to 20 min at sensitivities corresponding to one agent-containing particle per liter air, as measured using DNA detection on gene probe sensors and protein biomarkers in mass spectrometry, were demonstrated.

Challenges. Specific ABO identification platforms requiring the development of this technology include gene probe sensors, which provide highly specific and sensitive detection; and biological mass spectrometry, which provides broad spectrum coverage. Major technical challenges include the removal of environmental/biological materials that may diminish performance of these platforms, rapid preconcentration of samples, rapid and efficient extraction of nucleic materials or proteins, automation of the entire sample treatment process to permit fully unattended operation, and the development and incorporation of microscale (MEMS-level) components where possible while maintaining overall sensitivity and response time.

Milestones/Metrics.

FY2000: Demonstrate a fully automated, 2-ft3 BSPS concept coupled with a gene probe sensor and the next-generation biomass spectrometer for bio-aerosol analysis.

FY2001: Incorporate microscale approaches to reduce size of BSPS by 35% while maintaining overall sensitivity on both platforms against eight bacterial and viral materials. Demonstrate reduction of sample preparation time to 15 min.

Customer POC	Service/Agency POC	USD(AT&L) POC
LTC Mike LANPHERE, USA JSIG	Dr. Gary RESNICK SBCCOM/TPCBD	Dr. Anna JOHNSON-WINEGAR DATSD(CBD)

CB.20 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY00	FY01	FY02	FY03	FY04	FY05
0602384BP	CB2	3.3	2.8	0.0	0.0	0.0	0.0
	DTO Total	**3.3**	**2.8**	**0.0**	**0.0**	**0.0**	**0.0**

CB.22 *Medical Countermeasures for Vesicant Agents.*

Objectives. Demonstrate a safe and effective pharmacological countermeasure to prevent or decrease the severity of injuries caused by vesicant chemical agents, focusing principally on sulfur mustard. Several pharmacologically distinct classes of compounds have been identified and assessed, each of which interferes at a different point in the multistep chain of biological events triggered by sulfur mustard. These classes, which have been shown to have efficacy in one or more cellular or animal models, include intracellular calcium modulators, protease inhibitors, and various anti-inflammatory drugs. The various technological alternatives will ultimately be competed against one another with respect to safety and efficacy to determine an optimal approach (or combination of approaches) for transition to advanced development.

Payoffs. Vesicant chemical agents, such as sulfur mustard, are a significant threat to U.S. forces. There are no specific medical counteragents for blister agents. Medical management of the injuries these agents inflict presently depends on immediate decontamination followed by conventional treatment of the resulting blisters or burns, rather than on specifically designated pretreatment/treatment. This work will yield a vesicant agent countermeasure that will substantially reduce the number of casualties or degree of injury among exposed soldiers, with consequent reductions in the medical logistic burden. Effective countermeasures to vesicant chemical agents would deter their use and enhance capabilities of U.S. forces to sustain operational tempo.

Challenges. Major technical challenges include developing effective pretreatments completely devoid of side effects, developing suitable animal models, and extrapolating efficacy test results from animals to man.

Milestones/Metrics.

FY2000: Identify candidate medical countermeasures that reduce both morbidity and healing time by 50% following vesicant exposure. Demonstrate safety and efficacy of this countermeasure sufficient to transition to advanced technology development (concept exploration phase).

Customer POC	Service/Agency POC	USD(AT&L) POC
COL Robert DEADERICK, USA AMEDD/C&S	COL Gennady PLATOFF, USA USAMRMC	Dr. Anna JOHNSON-WINEGAR DATSD(CBD)
COL Ernest TAKAFUJI, USA OSD/HA		

CB.22 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY00	FY01	FY02	FY03	FY04	FY05
0602384BP	TC2	3.4	0.0	0.0	0.0	0.0	0.0
0603384BP	TC3	5.5	0.0	0.0	0.0	0.0	0.0
	DTO Total	**8.9**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

CB.23 ***Medical Countermeasures for Staphylococcal Enterotoxin B.***

Objectives. Develop medical countermeasures against the biological warfare (BW) threat of staphylococcal enterotoxin B (SEB) toxin. Recombinant vaccine technology will be exploited to provide an effective candidate that may be safer and more affordable to manufacture than traditional toxoid vaccines.

Payoffs. SEB is a validated BW threat of high priority. It is an incapacitating and potentially lethal biological toxin that can be delivered by either aerosol or oral routes to a target population. This easily produced bacterial toxin can be a serious problem on the battlefield, causing sepsis (blood poisoning) and shock. Deliberate exposure of troops to SEB delivered as a BW agent would significantly reduce mission effectiveness. The development of a vaccine against SEB reduces this threat for the warfighter, deters its use as a BW agent, and enhances strategic mobility.

Challenges. Major technical challenges include developing appropriate model systems for investigational purposes, determining expression vectors for recombinant products, and retaining antigenicity without superantigen properties in a vaccine candidate.

Milestones/Metrics.

FY2000: Transition to advanced development (program definition and risk reduction) a second-generation (recombinant) SEB vaccine that protects 80% of immunized personnel against both a lethal and an incapacitating aerosol challenge of SEB.

Customer POC	Service/Agency POC	USD(AT&L) POC
COL Robert DEADERICK, USA AMEDD/C&S	COL Gennady PLATOFF, USA USAMRMC	Dr. Anna JOHNSON-WINEGAR DATSD(CBD)
COL Ernest TAKAFUJI, USA OSD/HA		

CB.23 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY00	FY01	FY02	FY03	FY04	FY05
0602384BP	TB2	0.0	0.0	0.0	0.0	0.0	0.0
0603384BP	TB3	1.9	0.0	0.0	0.0	0.0	0.0
	DTO Total	**1.9**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

CB.24 ***Medical Countermeasures for Encephalitis Viruses.***

Objectives. Develop medical countermeasures against the biological warfare (BW) threat of the equine encephalitis viruses. Recombinant vaccine technology will be exploited to provide effective vaccine candidates.

Payoffs. Equine encephalitis viruses are a group of viruses that cause disorientation, convulsions, paralysis, and death. They are important BW threats because of aerosol infectivity and relative stability. Clinical illness associated with Venezuelan, Eastern, and Western equine encephalitides (VEE, EEE, and WEE, respectively) includes headache, fever, chills, nausea, vomiting, mental confusion, sleepiness, and sometimes seizures and other neurological signs and symptoms. Mosquito vectors normally transmit these alphaviruses to birds, horses, and humans; however, alphaviruses are very stable when freeze-dried and have the potential to be used as a biological weapon. Safe and effective vaccines are needed to protect warfighters. Current vaccines for alphaviruses causing encephalitis are inadequate. Improved vaccines would decrease the threat of BW and enhance strategic mobility. Under this DTO, vaccine candidates for EEE and WEE analogous to a VEE vaccine have been constructed.

Challenges. Major technical challenges include development of appropriate model systems for investigational purposes, and determining expression vectors for recombinant products.

Milestones/Metrics.

FY2000: Complete construction of analogous EEE and VEE IIIAa vaccine constructs. Complete assessment of VEE IE, VEE IIIA, EEE, and WEE in small animal models.

FY2001: Complete safety and efficacy testing of VEE IE, VEE IIIA, EEE, and WEE in nonhuman primate models. Complete potency and stability studies on all vaccine candidates. Complete definition of surrogate protection markers.

FY2002: Complete formulation and vaccine interference studies. Transition VEE multivalent vaccine (VEE IA/B, VEE IE, VEE IIIA)

FY2003: Transition combined VEE/EEE/WEE vaccine.

Customer POC	Service/Agency POC	USD(AT&L) POC
COL Robert DEADERICK, USA AMEDD/C&S	COL Gennady PLATOFF, USA USAMRMC	Dr. Anna JOHNSON-WINEGAR DATSD(CBD)
COL Ernest TAKAFUJI, USA OSD/HA		

CB.24 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY00	FY01	FY02	FY03	FY04	FY05
0602384BP	TB2	0.5	0.7	0.2	0.2	0.0	0.0
0603384BP	TB3	0.6	0.6	0.8	0.8	0.0	0.0
	DTO Total	**1.1**	**1.3**	**1.0**	**1.0**	**0.0**	**0.0**

CB.25 ***Multiagent Vaccines for Biological Threat Agents.***

Objectives. Produce a vaccine or vaccine delivery approach that could be used to concurrently immunize an individual against a range of biological warfare (BW) threats. Bioengineered and recombinant vaccine technologies (naked DNA vaccines or replicon vaccines) will be exploited to achieve multivalent vaccines that are directed against multiple agents, yet use the same basic construct for all of the agents.

Payoffs. Vaccines currently being developed for biological threat agents are univalent with respect to the threat itself (e.g., separate vaccines against agents such as anthrax, plague, botulinum toxins, variola virus). Multiagent vaccines to be demonstrated through this DTO would be analogous to such commercial vaccines as the combined diphtheria-pertussis-tetanus vaccine and the measles-mumps-rubella vaccine. The possibility of achieving protective immunity against multiple BW threat agents with a much reduced requirement for the number of vaccines or immunization schedules means greater flexibility and fewer time constraints in fielding a force protected against the threats. Other potential benefits include decreased cost of production, greater range of potential vaccine production facilities, and possibly faster licensure of vaccines. Due to the nature of some of the threat agents and lack of commercial viability for such a combined product, there is no other commercial or foreign source through which to procure such products. In FY99, animal models were developed for evaluating single and potential combined vaccines.

Challenges. Major technical challenges include development of appropriate model systems for investigational purposes; and evaluation of immunogenicity, efficacy, and possible interference effects of a multiagent vaccine candidate.

Milestones/Metrics.

FY2000: Select most promising approach and identify final agents to be incorporated into the combined product; begin evaluation of immunogenicity for combined products and examine for possible interference effects.

FY2001: Test efficacy of combined products both individually and in combined products.

FY2002: Complete preclinical data package for FDA; submit package for transition to advanced development (program definition and risk reduction phase).

Customer POC	Service/Agency POC	USD(AT&L) POC
COL Robert DEADERICK, USA AMEDD/C&S	CDR Shaun B. JONES, USN DARPA/DSO	Dr. Anna JOHNSON-WINEGAR DATSD(CBD)
COL Ernest TAKAFUJI, USA OSD/HA	COL Gennady PLATOFF, USA USAMRMC	

CB.25 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY00	FY01	FY02	FY03	FY04	FY05
0602383E	BW-01	1.0	1.0	1.0	0.0	0.0	0.0
0602384BP	TB2	1.0	0.5	0.3	0.0	0.0	0.0
0603384BP	TB3	0.9	1.5	1.7	0.0	0.0	0.0
	DTO Total	**2.9**	**3.0**	**3.0**	**0.0**	**0.0**	**0.0**

CB.26 *Common Diagnostic Systems for Biological Threats and Endemic Infectious Diseases.*

Objectives. Develop state-of-the-art technologies (platforms/devices) capable of diagnosing infectious disease and biological warfare (BW) agents in clinical specimens. The devices will be used by preventive medicine personnel for disease surveillance and monitoring, and by medical laboratory personnel for the diagnosis of disease due to natural and BW threat agents. Efforts will focus on an immunologically based membrane device to rapidly detect host immune responses to etiologic agents or the antigens or products of the agents themselves, and on miniaturized polymerase chain reaction technology for detection and identification of nucleic acids of natural infectious disease and BW agents.

Payoffs. The ability to quickly identify exposure to specific BW and infectious disease agents and rapidly treat warfighters is critical to maintaining the strength of the force and to giving commanders the ability to provide specific protective measures to yet unexposed warfighters. The technologies to be provided will benefit all elements of health care from forward-based to CONUS-based fixed medical facilities, and will allow medical diagnosis of biological threat agents and endemic infectious diseases much farther forward on the battlefield than is currently possible. Many BW agent-induced illnesses have early symptoms that are flu-like and indistinguishable from each other and other less harmful pathogens. The ability to detect infection immediately after exposure would be extremely helpful in determining whether a BW attack has occurred and how many warfighters were exposed and in need of treatment. Early diagnosis is key to providing effective therapy. An effective broad diagnostic capability is important in locating the correct therapeutics and getting them moved in-theater in a timely manner. Collaborations with industrial/biotechnology entities, government, and academic centers of excellence will be developed to leverage continuing advances in biotechnology and industry. In FY99 an immunologically based membrane platform was transitioned to advanced development (program definition and risk reduction phase.) The immunologically based membrane platform requires no special instrumentation and is capable of (1) the rapid detection of specific host immune responses to a broad range of etiologic agents, or (2) the detection of the antigens or products of these agents in clinical specimens with 100% specificity and 97% sensitivity for each agent.

Challenges. Requisite technologies require adaptation for clinical use and for detection of specific infectious disease or BW agents. Challenges include development of appropriate antibodies, elimination of interference from substances contained in clinical samples, and selection of appropriate nucleic acid probes. There are a large number of actual and potential biological threat agents. The diagnostic system must be able to distinguish these diverse pathogens both from each other and from those common natural infections that may begin with similar signs and symptoms. Current diagnostic systems also require manual sample collection and preparation, which is labor intensive and time consuming, especially when large numbers of clinical samples must be collected in the field.

Milestones/Metrics.
FY2002: Transition to advanced development a handheld device capable of detecting and identifying nucleic acids of a broad range of natural infectious disease and BW agents in clinical specimens with 100% specificity and 97% sensitivity for each agent. Refine diagnostic technologies as applied directly to the diagnostic tests and devices, emphasizing specific genetic targets as derived from genomic sequencing. Define and characterize immunological and nucleic acid-based diagnostic platform methodologies. Validate immunologically based diagnostic assays for specific BW agents.

Customer POC	Service/Agency POC	USD(AT&L) POC
COL Robert DEADERICK, USA AMEDD/C&S	COL Charles H. Jr. HOKE, USA - USAMRMC	Dr. Anna JOHNSON-WINEGAR DATSD(CBD)
COL Ernest TAKAFUJI, USA - OSD/HA	Dr. Steven S. MORSE – DARPA/DSO	
	COL Gennady PLATOFF, USA - USAMRMC	

CB.26 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY00	FY01	FY02	FY03	FY04	FY05
0602383E	BW-01	2.0	1.0	0.0	0.0	0.0	0.0
0602384BP	TB2	0.6	0.6	0.6	0.0	0.0	0.0
0603384BP	TB3	1.0	1.0	1.0	0.0	0.0	0.0
	DTO Total	**3.6**	**2.6**	**1.6**	**0.0**	**0.0**	**0.0**

CB.27 *Therapeutics Based on Common Mechanisms of Pathogenesis.*

Objectives. Develop a suite of medical countermeasures against broad classes of biological pathogens (bacterial, viral, bioengineered, etc.) that share common mechanisms of pathogenesis.

Payoffs. Effective pathogen countermeasures may not eliminate the threat of biological warfare by a determined adversary, but they can provide a significant disincentive to its use. Program success will provide vaccine and therapeutic countermeasures that will reduce the threat of biological warfare and its operational impact through the development of new broad-spectrum antivirals and antibacterials. These will be particularly important for new emerging and bioengineered threats for which we have no current countermeasures.

Challenges. The large number of actual and potential threats include hitherto unknown pathogens and virulence strategies. A particular concern is the exploitation of modern genetic engineering by adversaries to develop ``super-pathogens`` or to disguise agents. This emerging capability puts an even greater stress on our ability to detect and combat the medical consequences of exposure and infection. In addition, the operational environment constitutes one of generalized immunosuppression, further increasing both the risk from biological threats and the need for robust immune defenses.

Milestones/Metrics.

FY2000: Identify broad-spectrum strategies with potential for immunomodulatory activity against multiple pathogens. Identify virulent mechanisms shared by multiple pathogens.

FY2001: Develop novel therapeutics targeting the common pathways of pathogenesis.

FY2002: Demonstrate efficacy of candidate therapeutics in laboratory and animal models.

FY2003: Develop testing and evaluation architectures for operational force protection efficacy.

Customer POC	Service/Agency POC	USD(AT&L) POC
COL Robert DEADERICK, USA AMEDD/C&S	Dr. Michael GOLDBLATT DARPA/DSO	Dr. Anna JOHNSON-WINEGAR DATSD(CBD)
COL Ernest TAKAFUJI, USA OSD/HA	CDR Shaun B. JONES, USN DARPA/DSO	
	COL Gerald PARKER, USA ACC/HQ USAMRMC	

CB.27 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY00	FY01	FY02	FY03	FY04	FY05
0602383E	BW-01	14.0	12.0	9.0	5.0	0.0	0.0
	DTO Total	**14.0**	**12.0**	**9.0**	**5.0**	**0.0**	**0.0**

CB.28 ***Chemical Agent Prophylaxes II.***

Objectives. As a follow-on to the completed DTO CB.21, continue development (Phase 0) of a prophylactic that can detoxify nerve agents at a sufficient rate to protect the warfighter from exposure to up to five median lethal doses (5LD50) of nerve agents. The prophylactic substance should be nontoxic, produce no adverse side effects, have no adverse effect on performance, be easy to administer, and have a long in vivo half-life.

Payoffs. Nerve agents are a validated threat to U.S. forces. In comparison to currently fielded nerve agent countermeasures, achievement of this technology objective would provide a capability for extended protection against a wide spectrum of nerve agents without causing side effects, behavioral effects, or the need for extensive postexposure therapy. Improved prophylaxis for chemical warfare agents deters their use by the enemy and increases the capability of U.S. and allied forces to sustain operational tempo and provide full-dimension protection. The successful application of this technology could reduce the reliance on mission-oriented protective posture gear by the warfighter.

Challenges. Major technical challenges include developing effective prophylactics devoid of side effects, developing circulating scavengers with extended half-lives, developing suitable animal models for these studies, producing sufficient material for safety and efficacy studies, and extrapolating efficacy test results from animals to man.

Milestones/Metrics.

FY2000: Develop in vivo transgenic animal models for use as testbeds for evaluating scavengers. Expand the evaluation of human protein catalytic scavengers to include enzymes and human butyrylcholinesterase. Initiate development of an animal model capable of producing large quantities of recombinant enzyme scavenger. Identify several delivery platforms for bioscavenger genetic material for exploration of administration of bioscavengers via gene therapy.

FY2001: Expand physiologically based pharmacokinetic (PK) models for use as PK studies of candidate scavengers with/without agent present. Complete the evaluation of human protein catalytic scavengers. Examine human protein scavengers for human safety. Determine the 3D x-ray crystallographic structure of human CaE and human PON-1. Determine through discussions with the FDA the type(s) of data required for submission with an Investigational New Drug application for a human recombinant catalytic protein.

FY2002: Complete development/validation of a transgenic animal model capable of producing sufficient amounts of recombinant enzyme scavenger material for clinical trials. Determine safety and efficacy of scavenger candidates in two animal species. Complete testing of various vector/gene combinations to validate in an animal model the concept of gene therapy for delivery of bioscavengers. Convene milestone I in-process review to approve transition of candidate(s) scavengers to Phase I of development.

FY2002: Transition to a chemical warfare agent prophylactic that will protect the warfighter for a period greater than 8 hr against exposure to 5LD50s of nerve agent.

Customer POC	Service/Agency POC	USD(AT&L) POC
COL Ernest TAKAFUJI, USA OSD/HA	COL Gennady PLATOFF, USA USAMRMC	Dr. Anna JOHNSON-WINEGAR DATSD(CBD)
COL Helen S. TIERNAN, USA USAMEDD/C&S		

CB.28 S&T Funding

(Dollar Amounts in Millions)

PE	Project	FY00	FY01	FY02	FY03	FY04	FY05
0602384BP	TC2	1.3	1.2	1.0	0.0	0.0	0.0
0603384BP	TC3	0.6	0.7	1.0	0.0	0.0	0.0
	DTO Total	**1.9**	**1.9**	**2.0**	**0.0**	**0.0**	**0.0**

CB.29 *Reactive Topical Skin Protectant.*

Objectives. The technical objective of this program is to increase the protection offered by the existing topical skin protectant (TSP) by incorporating a reactive compound that will detoxify nerve and blister agents. This reactive substance must be compatible with the TSP and not irritate the skin.

Payoffs. Vesicant and nerve agents are significant threats to U.S. forces. While prophylaxis and treatment compounds are available for nerve agents, no specific countermeasures have been developed for vesicants such as sulfur mustard (HD). Reactive TSPs would either augment the protection afforded by the protective overgarments or, ideally, redefine and reduce the circumstances requiring mission-oriented protective posture levels. The rapid action of vesicating agents such as HD and lewisite suggests that a pre-exposure skin protection system offers the best opportunity to prevent the serious consequences from percutaneous exposure to these agents. This approach also reduces the risks from exposure to nerve agents. Improved prophylaxis for chemical warfare agents deters their use by the enemy and increases the capability of U.S. and allied forces to sustain operational tempo.

Challenges. Major technical challenges include identifying catalytic reactive moieties, developing suitable evaluation models, and extrapolating efficacy test results from animals to man.

Milestones/Metrics.

FY2000: Initiate formulation studies of mixtures of reactive compound and TSP. Begin downselection process

FY2001: Demonstrate the efficacy of reactive TSP formulation candidate(s) using two animal species.

FY2002: Complete formulation studies. Perform acute eye and skin irritation safety evaluations. Demonstrate efficacy of RTSP formulation against estimated battlefield levels of nerve and blister agent as liquids or vapors. Select best formulation candidate(s) for transition to development. Convene in-process review (milestone I) to consider transition of RTSP formulation to Phase 1 (Program Definition and Risk Reduction). Transition RTSP formulation capable of protecting against anticipated battlefield levels of nerve or blister agents with no adverse side effects.

Customer POC	Service/Agency POC	USD(AT&L) POC
COL Ernest TAKAFUJI, USA OSD/HA	COL Gennady PLATOFF, USA USAMRMC	Dr. Anna JOHNSON-WINEGAR DATSD(CBD)
COL Helen S. TIERNAN, USA USAMEDD/C&S		

CB.29 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY00	FY01	FY02	FY03	FY04	FY05
0602384BP	TC2	0.0	0.0	0.0	0.0	0.0	0.0
0603384BP	TC3	0.4	0.4	0.4	0.0	0.0	0.0
	DTO Total	**0.4**	**0.4**	**0.4**	**0.0**	**0.0**	**0.0**

L.07 *Terrorist Chemical/Biological Countermeasures.*

Objectives. Develop effective countermeasures for detecting and identifying chemical/biological (CB) agents and toxic industrial chemicals (TICs) deployed in terrorist weapons.

Payoffs. The development of enhanced countermeasures will improve the capabilities of military and civilian units responding to terrorist threat incidents.

Challenges. The key challenge is to develop lightweight systems to detect and identify a wide range of CB and TIC threats in an urban environment, while overcoming system complexity, operability and affordability issues. Another key challenge involves the development of systems capable of standoff nonintrusive detection and identification of improvised terrorist devices containing CB threats.

Milestones/Metrics.

FY2000: Demonstrate enhanced chemical point detection systems that detect and identify 30% more chemical threat agents than current systems. Perform laboratory testing of nonintrusive detection and identification of priority chemical threat agents contained in improvised devices.

FY2001: Demonstrate lightweight (30% weight reduction) chemical point detector with capability to detect and identify a wide range of chemical threat agents and priority TIC threat agents. Perform field trial for nonintrusive detection and identification of priority chemical threat agents contained in improvised devices.

FY2002: Demonstrate lightweight (at least 30% weight reduction) system capable of point detecting at least six priority biological agents. Demonstrate first system capable of nonintrusive detection and identification of chemical terrorist threat agents with high impurities, and determine feasibility of nonintrusive detection of biological agents

FY2003: Demonstrate lightweight CB detection systems having less than a 2% false-alarm rate, and the capability of detecting a wide range of terrorist threat agents in urban environments.

Customer POC	Service/Agency POC	USD(AT&L) POC
LTC Vincent KAM, USA	Mr. Tracy CRONIN	Dr. Anna JOHNSON-WINEGAR
JCS, J34	CTTSO	DATSD(CBD)
	Mr. David R. LEWIS, USAF	Mr. John REINGRUBER
	DTRA/SWP	OSD/SOLIC

L.07 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY00	FY01	FY02	FY03	FY04	FY05
0603122D	P484	3.0	3.0	2.5	2.5	0.0	0.0
0603160BR	P539	1.1	1.1	1.0	2.0	0.0	0.0
	DTO Total	**4.1**	**4.1**	**3.5**	**4.5**	**0.0**	**0.0**

L.12 *Force Medical Protection/Dosimeter ACTD.*

Objectives. Develop an individually worn sampler that can continuously measure and archive exposure levels of chemical and biological warfare agents. Phase I of the development will emphasize collection and archiving of exposure to chemical agents using passive sampling methodology. Phase II will trap biological pathogens for real-time and later analysis, and could potentially provide an alarm to warn the wearer of an immediate chemical hazard.

Payoffs. Improved detection and identification capabilities will provide greater awareness of immediate chemical exposure risk, more precise identification of exposure, and amount of individual or multiple doses that will result in improved situational awareness, treatment, and record keeping. Additional payoffs will include the (1) ability to perform real-time analysis of agents, (2) communication of exposure information to command centers, and (3) increased battlefield awareness and intelligence. This ACTD leverages activities in the Terrorist Chemical/Biological Countermeasures program and DARPA efforts in pathogen detection/identification.

Challenges. Specific challenges include developing technologies to collect, analyze, and differentiate between agents, interferents, and naturally occurring compounds; and improving selectivity and sensitivity to agents. Providing communications capabilities and real-time alarm while reducing size and weight will require advances in sampling methods, chemical analysis techniques, and electronics. Developing a concept of operations to include use of a sampler will require modeling, experimentation, and field testing to improve capabilities and increase utility.

Milestones/Metrics.

FY2000: Conduct technical evaluations of Phase II candidate technologies and select technologies for integration into the Phase II sampler. Begin laboratory of Phase II technologies. Conduct demonstration to assess sampler's ability to deal with operational issues identified by USACOM and other federal partners.

FY2001: Deliver residual capability to selected units for further user testing and development.

FY2002: Deliver residual capability to selected units for further user testing and development.

Customer POC	Service/Agency POC	USD(AT&L) POC
LTC Vincent KAM, USA	Mr. Doug BRYCE	Dr. Anna JOHNSON-WINEGAR
JCS, J34	MARCORSYSCOM/CSSLE	DATSD(CBD)
	Mr. Randy ROHR	Dr. Laura PARKER
	DTRA	DUSD/AS&C
		Mr. Jeff PAUL
		ODUSD(S&T)/SS
		Mr. John REINGRUBER
		OSD/SOLIC

L.12 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY00	FY01	FY02	FY03	FY04	FY05
0603122D	P484	1.2	0.0	0.0	0.0	0.0	0.0
0603160BR	P539	1.0	0.7	0.0	0.0	0.0	0.0
0603750D	P523	0.6	0.1	0.1	0.0	0.0	0.0
	DTO Total	**2.8**	**0.8**	**0.1**	**0.0**	**0.0**	**0.0**

Mr. HALLORAN. Thank you.

Mr. SHAYS. Mr. Blagojevich.

Mr. BLAGOJEVICH. Yes. Hi. I have been listening. We voted for legislation that requires your agency to conform to the Results Act. Can you tell us when you expect you will be conforming with the Results Act?

Ms. JOHNSON-WINEGAR. Well, I think it is an evolving process. Obviously, it will be something that we come to agreement on within the Department as to when we have reached what we consider compliance. I think we have taken the first steps toward that in identifying our mission and our goals, and we are now in the process of refining that a little bit further. We hope to have most of that work completed this year.

Mr. BLAGOJEVICH. Good. So that next year, when you come back before this committee, it is reasonable to think that we can expect that you will be conforming to the Results Act?

Ms. JOHNSON-WINEGAR. Well, certainly that will be your interpretation, as to whether we're conforming, but we certainly hope to be well along the way, if not completely there.

Mr. BLAGOJEVICH. OK. All right. So of course, the objective ultimately would be that a year from now, you can come back before this subcommittee and say, "We've conformed?"

Ms. JOHNSON-WINEGAR. I would certainly like to be able to say that, in my opinion, we're conforming. Of course, other people could always develop their own opinions, although I would hesitate to presuppose that because I think I'm conforming, that everyone else would naturally agree with me.

Mr. BLAGOJEVICH. OK. Well, your interpretation of conforming next year would certainly be a first step, I would think?

Ms. JOHNSON-WINEGAR. Yes. Certainly. [Laughter.]

Mr. BLAGOJEVICH. OK. Thank you.

Mr. SHAYS. Let me put it a different way.

Ms. JOHNSON-WINEGAR. OK.

Mr. SHAYS. It may be that Rod is the chairman of this committee, or it may be that I am, but whoever it is, you have to comply——

Ms. JOHNSON-WINEGAR. Yes.

Mr. SHAYS [continuing]. And when I chaired the Human Resources Committee and we had the tainted blood supply that had resulted in the death of individuals from AIDS and the contamination because of Hepatitis-C, we could have really nailed HHS, but that wasn't our motive. Our motive was to see bad practice become good practice.

I have that same feeling here. You have to conform, and it's not just for the $791 million that you're spending, but it's what DARPA spends, it's what all DOD spends. And you are our hope that it will be spent well. And it's not going to be your opinion; it's going to be whether or not you conform to the law.

I would feel a lot better about this if your answer to Mr. Blagojevich had been simply, "We know we have areas where we have to improve, and we're going to do it; and next year, when we come here, we will have done it." The Results Act doesn't mean that all the results are good; it means that now we have a system

to know what our goals and objectives are, and we have a way to evaluate it. And we don't feel we have that.

There is really not much more that we need to say today about that. You have a wonderful reputation. You've worked there for years. But we have wanted to get DOD to change practices that have existed for years. It's not really a debatable issue, I don't think. And in terms of DARPA, this will be something this committee will look at. You clearly have oversight over DARPA as it relates to chemical and biological responsibilities, and this committee, Mr. Blagojevich and myself and our staff, we stand ready to help you, and so does GAO. GAO is not there throwing darts; they are there to point out what needs to be done, and they will help you. And I would say to you that being the focal point does not mean that you aren't in charge. You are in charge of this responsibility, and I have the confidence that you will be able to make sure that it is done, I really do.

I don't have anything else to add. Do you have anything you would like to say?

Ms. JOHNSON-WINEGAR. Well, I would just like to clarify—perhaps I was a little too negative when I said we would be in compliance, and I perhaps implied that we wouldn't. I certainly commit to you and to everyone that is involved in the program that I am certainly committed to making our program as compliant as I can, with the understanding, of course, that it is an evolving process——

Mr. SHAYS. No, that's not acceptable. It's not an evolving process. I'm not saying that we're going to see chemical and biological success in all those areas, that you are going to have met all your goals. But the process needs to be in place now, tomorrow, the next day. You need to sit down with your people and say, "Where are we conforming with the Results Act and where aren't we? And where we're not, we're going to do it." And if you need help from GAO or anyone else, you need to get it. That's the bottom line. There really is a bottom line. It can't be an evolving process.

If I let you get away with that statement, that basically is like saying that no one is in charge. No, you are in charge; the law is clear; and I would like to hear you say that you will make sure it's done. With all the experience that you have—and I sound like I'm lecturing; I don't mean to be, I just have to say, please say that. When we had the Secretary of HHS here and she came—she could have had someone else come to describe and defend the failure to protect the blood supply—she came and said, "We haven't done it correctly, that's obvious; it will get done." Now, I admit that she happens to be the Secretary, so she carries a lot more authority.

I will say this to you: you are in charge of this program. If you do not think you can do it, I would like to know, because then we will ask whoever is not enabling you to do that to come before the committee.

Ms. JOHNSON-WINEGAR. Oh, I certainly can do it, and I commit to you that I will do it——

Mr. SHAYS. Thank you.

Ms. JOHNSON-WINEGAR [continuing]. And I guess my evaluation of the evolution and the evolving process was meant to say that we will set very high goals for our program, and we may have to com-

promise and accept interim goals, but we will have measurable goals so that we are in compliance.

I take your comment that maybe we won't make all our goals as a personal challenge because I would certainly like to see us——

Mr. SHAYS. I understand that, if that's the context in which you meant it. But the bottom line question is, does your agency intend to follow the Results Act?

Ms. JOHNSON-WINEGAR. Certainly. For the Chemical and Biological Defense Program, I make that commitment to you, yes.

Mr. SHAYS. Thank you.

With that, we will stand adjourned.

[Whereupon, at 11:25 a.m., the subcommittee was adjourned.]

○