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COMBATING TERRORISM: COORDINATION OF NON-MEDICAL R&D PROGRAMS

HEARING

BEFORE THE

SUBCOMMITTEE ON NATIONAL SECURITY, VETERANS AFFAIRS, AND INTERNATIONAL RELATIONS

OF THE

COMMITTEE ON GOVERNMENT REFORM

HOUSE OF REPRESENTATIVES

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COMBATING TERRORISM: COORDINATION OF NON-MEDICAL R & D PROGRAMS

WEDNESDAY, MARCH 22, 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 11:10 a.m., in room 2247, Rayburn House Office Building, Hon. Christopher Shays (chairman of the subcommittee) presiding.

Present: Representatives Shays and Blagojevich.

Staff present: Lawrence J. Halloran, staff director and counsel; J. Vincent Chase, chief investigator; R. Nicholas Palarino, senior policy advisor; Robert Newman, Kristine McElroy, and Thomas Costa, professional staff members; Jason M. Chung, clerk; David Rapallo, minority counsel; and Earley Green, minority staff assistant.

Mr. SHAYS. I would like to call this committee meeting to order and to say that I have a great job being able to serve in this capacity, and I really appreciate the witnesses that are going to be participating today. It is a very important issue and we appreciate the good work of everyone involved. The purpose of this hearing is just to help us sort out where we are at and where we need to go and where we can improve, and that is ultimately the objective of everyone here.

This Friday, in Connecticut, municipal, State and Federal emergency management officials will conduct a tabletop exercise to plan their response to a fictional but all too plausible incident of terrorism involving the use of chemical and biological weapons.

Much of the technology they will discuss—detectors, protective gear, and decontamination equipment—is the producte of research and development [R&D], begun 10 to 15 years ago. Today, we ask how effectively today's Federal R&D efforts are focused on the needs of local first responders to meet tomorrow's terrorism threats.

According to the General Accounting Office [GAO], research and development of non-medical technologies to meet chemical and biological threats is being conducted by several military and civilian agencies. In looking at four major R&D programs, GAO found all four are working on biological agent detectors, three are developing chemical detection and identification capability, and three are pursuing modeling and dispersal simulation. GAO found efforts to

avoid duplication in these R&D programs informal and inconsistent.

As we learned in our previous hearings, terrorism may know no boundaries, but bureaucratic barriers can be impervious to the need for interagency coordination and cooperation. The risk of overlap, waste, or missed opportunities to fill technological gaps is compounded by faulty or dated threat assessments. According to GAO, "Several programs do not formally incorporate existing information on chemical and biological threats or needed capabilities in deciding what research and development projects to fund."

If the threat doesn't drive R&D commitments, what does? Critical decisions are being made today that will determine whether local police, firefighters, and emergency medical personnel will have the technology they need to confront the next generation of terrorism. Our witnesses this morning make many of those decisions, or are in a position to influence those who do. We look to them for assurances that Federal research and development programs will be effectively coordinated and efficiently run.

[The prepared statement of Hon. Christopher Shays follows:]

Statement of Rep. Christopher Shays

March 22, 2000

This Friday in Connecticut, municipal, state and federal emergency management officials will conduct a "tabletop" exercise to plan their response to a fictional, but all too plausible, incident of terrorism involving the use of a chemical and biological weapons. Much of the technology they will discuss - detectors, protective gear and decontamination equipment - is the product of research and development (R&D) begun 10 to 15 years ago.

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Mr. SHAYS. Our first panel is members of the GAO: Kwai-Cheung Chan, Director, National Security and International Affairs Division; Dr. Sushil K. Sharma, Associate Director, National Security and International Affairs Division; and Weihsueh Chiu, also from GAO.

I believe we have just one testimony and that is from you, Mr. Chan.

Mr. CHAN. Yes, sir.

Mr. SHAYS. We are happy to have you here, as always.

Mr. CHAN. Thank you, sir.

Mr. SHAYS. Pardon me. I need to administer the oath. I wish I could just swear you in at the beginning of the year and just call it quits from then on.

[Witnesses sworn.]

Mr. SHAYS. Note for the record all three witnesses have responded in the affirmative.

So we welcome your testimony. Thank you.

STATEMENTS OF KWAI-CHEUNG CHAN, DIRECTOR, SPECIAL STUDIES AND EVALUATIONS, NATIONAL SECURITY AND INTERNATIONAL AFFAIRS DIVISION, U.S. GENERAL ACCOUNTING OFFICE, ACCOMPANIED BY SUSHIL K. SHARMA, ASSOCIATE DIRECTOR, SPECIAL STUDIES AND EVALUATIONS, NATIONAL SECURITY AND INTERNATIONAL AFFAIRS DIVISION, U.S. GENERAL ACCOUNTING OFFICE; AND WEIHSUEH CHIU, EVALUATOR, SPECIAL STUDIES AND EVALUATIONS, NATIONAL SECURITY AND INTERNATIONAL AFFAIRS DIVISION, U.S. GENERAL ACCOUNTING OFFICE

Mr. CHAN. Good morning, Mr. Chairman and members of the subcommittee. I am pleased to be here today to discuss our report on the coordination of Federal non-medical research and development programs addressing chemical and biological threats. We examined four programs which conduct non-medical R&D. These programs focus on developing systems and technologies for detecting, identifying, protecting, and decontaminating against chemical and biological agents.

These programs are, one, DOD's Chemical and Biological Defense Program which was established under the National Defense Authorization Act for fiscal year 1994; the Defense Advanced Research Projects Agency's Biological Warfare Defense Program, established in 1996; three, the Department of Energy's Chemical and Biological Nonproliferation Program, established in 1997 in response to the Defense Against Weapons of Mass Destruction Act passed by Congress in 1996; and, four, the Counterterror Technical Support Program conducted by an interagency Technical Support Working Group [TSWG].

I will discuss the following three issues. First, what processes are used to decide how to invest funds in R&D activities? Second, what similarities exist among Federal programs that conduct R&D in this area? Finally, I will present how these programs are coordinated in the activities.

Before I discuss the results, let me briefly describe the context. Subsequent to the gulf war, concerns about the possible use of chemical and biological weapons in both military and civilian set-

tings led Congress and Federal agencies to implement several new or expanded programs. Overall funding in this area has increased significantly in recent years.

In addition, today several civilian and military agencies are conducting R&D designed to develop equipment to counter these threats. Total non-medical R&D funding in this area has increased from $76.5 million in fiscal year 1996 to a projected amount of nearly $190 million for fiscal year 2001, an increase of over 140 percent in 6 years.

Let me turn to our findings. First, it is important to note that developing technology through R&D can be a lengthy process, sometimes extending to 10 years or more. Hence, it often does not offer a solution to immediate needs. To effectively plan and implement chemical and biological defense R&D, three key steps are to, one, identify, validate and prioritize chemical and biological threats; delineate the capabilities needed to address these threats; and allocate program resources to activities that develop those capabilities.

Assessing threats may involve multiple dimensions, such as which particular chemical or biological agent might be used, how they may be delivered, and who might be the perpetrators. Delineating capability requires risk-based assessment of what specific capabilities are needed to address the threat.

Before allocating program resources to R&D, one must evaluate the extent to which existing technology can address immediate needs and then identify gaps. R&D activities that are conducted outside this framework can carry the risk of developing a system that is technology-driven and not threat-driven, or one that users do not want or need. We have previously reported that civilian programs to combat terrorism do not follow these steps. Specifically, we recommended that a national level comprehensive threat and risk assessment to combat terrorism be done.

Second, we found that these programs have several similarities. For instance, all of them conduct applied research and develop prototype equipment to demonstrate the practical utility of proposed technologies. Two of the programs focus on threats to the military, and the other two focus on threats to civilians.

However, the military and civilian user communities are concerned about many of the same chemical and biological agents, such as nerve agents, and possible perpetrators, such as terrorists. In addition, we found that these programs are seeking to develop many of the same capabilities, such as detection and identification of biological agents.

Furthermore, in some instances the technologies they are pursuing are similar. Examples of this include mass spectroscopy and flow cytometry for detecting bio agents. We also found that in some cases these programs contract with the same laboratories to perform the same research and development work.

Finally, I will discuss the extent of coordination among these programs. Although the four programs we examined currently use both formal and informal mechanisms for coordination, we found several problems that may hamper their coordination efforts.

First, participation in coordination meetings is inconsistent. For instance, sometimes they do not include representatives of the civil-

ian user community. Second, program officials cite a lack of comprehensive information on which chemical and biological threats to the civilian population are most important and what capabilities for responding to these threats are most needed.

Third, programs which are growing rapidly, such as the Department of Energy's program, do not formally incorporate existing information on chemical and biological threats or needed capabilities in deciding which R&D projects to fund. Without effective coordination among these agencies, R&D efforts might be duplicative, resulting in waste, and important capability gaps might not be addressed.

In summary, basic information is needed to compare the goals and objectives of the various program activities to better assess whether overlaps, gaps, and opportunities for collaboration exist. Much of this basic information, beginning with a comprehensive assessment of the threat and the risk, does not yet exist.

This concludes my formal statement, and we will be happy to answer any questions you have.

[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 Government Reform, House of Representatives

For Release on Delivery
Expected at 10:00 a.m.
March 22, 2000, Wednesday

CHEMICAL AND BIOLOGICAL DEFENSE

Observations on Nonmedical Chemical and Biological R&D Programs

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

GAO/T-NSIAD-00-130

Mr. Chairman and Members of the Subcommittee:

We are pleased to be here today to discuss our report on the coordination of federal nonmedical research and development programs that address chemical and biological threats.[1] In the last decade, concerns about the possible use of chemical and biological weapons in both military and civilian settings led Congress and federal agencies to implement new or expanded programs to address these threats. Overall funding in this area increased significantly from 1996 to date. Today, several civilian and military agencies are now conducting research and development programs designed to counter these threats. Without effective coordination among the different agencies, efforts might be unnecessarily duplicated and important questions might be overlooked.[2] Our testimony today identifies similarities among nonmedical research and development programs and explains how coordination mechanisms may ineffectively address potential duplication, research gaps, and opportunities for collaboration.

Nonmedical research and development focuses on developing techniques for detecting, identifying, or protecting against chemical and biological agents as well as for decontaminating personnel and equipment. The scope of our work was limited to federal programs that fund unclassified research and development. We examined four programs: (1) the Department of Defense's Chemical and Biological Defense Program, (2) the Defense Advanced Research Projects Agency's Biological Warfare Defense Program, (3) the Department of Energy's Chemical and Biological Nonproliferation Program, and (4) the Counterterror Technical Support Program conducted by an interagency working group called the Technical Support Working Group. The intended users of the technologies developed in these

[1] *Chemical and Biological Defense: Coordination of Nonmedical Chemical and Biological R&D Programs* (GAO/NSIAD-99-160, Aug. 16, 1999).

[2] See, for example, *Evaluating Federal Research Programs: Research and the Government Performance and Results Act,* National Research Council, National Academy Press, 1999.

programs may be a single military service (such as the Army), multiple services, or organizations that are responsible for addressing threats to civilians (e.g., federal, state, and local emergency response personnel).

SUMMARY

Each of the federally funded programs conducting nonmedical research and development on threats from chemical and biological agents has its own mission objective. However, we found many similarities among these programs in terms of the research and development activities they engage in, the threats they intend to address, the types of capabilities they seek to develop, the technologies they pursue in developing those capabilities, and the organizations they use to conduct the work. For example, these programs conduct a similar range of research and development activities, such as evaluating the feasibility or showing the practical utility of a technology. With regard to threat, two of the programs (those in the Department of Defense and Defense Advanced Research Projects Agency) focus on threats to the military, and the other two (those in the Department of Energy and the Technical Support Working Group) focus on threats to civilians. However, the military and civilian user communities are concerned about many of the same chemical and biological substances (such as nerve agents) and possible perpetrators (such as foreign terrorists). In addition, we found that these programs are seeking to develop many of the same capabilities, such as detection and identification of biological agents. Furthermore, the types of technologies (such as mass spectroscopy) they pursue to achieve those capabilities may overlap. Finally, these programs may contract with the same groups of laboratories to perform research and development work.

Although the four programs we examined currently use both formal and informal mechanisms for coordination, we found several problems that may hamper their coordination efforts. First, participation in formal and informal coordination mechanisms is inconsistent. For instance, several of

these mechanisms do not include representatives of the civilian user community. Second, program officials cited a lack of comprehensive information on which chemical and biological threats to the civilian population are the most important and on what capabilities for addressing these threats are most needed. Third, several programs do not formally incorporate existing information on chemical and biological threats or needed capabilities in deciding what research and development projects to fund. Having and using detailed information on civilian chemical and biological threats and the capabilities needed to respond to those threats would enable coordination mechanisms to better assess whether inefficient duplication or critical research gaps exist, and if so, what changes should be made in federal research and development programs.

BACKGROUND

Four federal programs that currently fund nonmedical research and development (R&D) on chemical and biological threats are described in table 1.

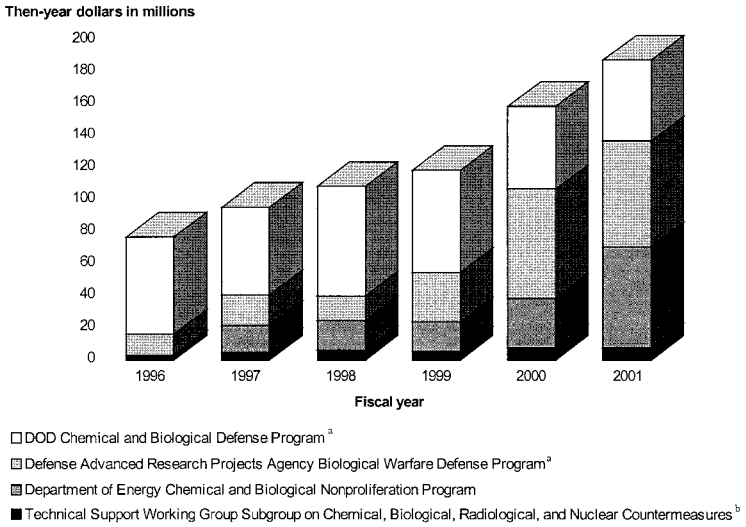
Table 1: Federal Programs Funding Nonmedical R&D on Chemical and Biological Threats

Agency	Program	Description
Department of Defense (DOD)	Chemical and Biological Defense Program	The objective of DOD's Chemical and Biological Defense Program is to enable U.S. forces to survive, fight, and win in chemically and biologically contaminated environments.
Defense Advanced Research Projects Agency	Biological Warfare Defense Program	This program funds R&D projects supporting revolutionary approaches to biological warfare defense, emphasizing high-risk, high-potential technologies.
Department of Energy	Chemical and Biological Nonproliferation Program	This program funds R&D to develop advanced technologies to enable the United States to more effectively prepare and respond to the use of chemical and biological weapons.
Technical Support Working Group	Counterterror Technical Support Program	The Technical Support Working Group is an interagency working group whose mission is to facilitate interagency R&D for combating terrorism primarily through rapid research, development, and prototyping. Their Subgroup on Chemical, Biological, Radiological, and Nuclear Countermeasures oversees, among other activities, the development of techniques to detect, protect from, and mitigate chemical and biological weapons.

Sources: GAO compilation of information from DOD, the Defense Advanced Research Projects Agency, the Department of Energy, and the Technical Support Working Group.

Program funding information, as of July 1999, is summarized in figure 1. Recently initiated non-DOD R&D programs have grown rapidly as compared to DOD's program. R&D funding for DOD's Chemical and Biological Defense Program decreased from $54.6 million in fiscal year 1997 to a projected $50.7 million for fiscal year 2001. In contrast, over the same period, R&D funding for Energy's program as well as for the Defense Advanced Research Projects Agency's program increased to the point of surpassing DOD's program. For instance, Energy's program went from $17 million in fiscal year 1997 to $63 million projected for fiscal year 2001.

Figure 1: Actual and Projected Funding for Nonmedical Basic Research, Applied Research, and Prototype Development Addressing Chemical and Biological Threats



[a] DOD and Defense Advanced Research Projects Agency budgets include only the nonmedical R&D categories of the DOD budget activities of basic research, applied research, and advanced technology development. The fiscal year 1997 DOD Chemical and Biological Defense Program budget excludes Defense Advanced Research Projects Agency funds, which were consolidated into the Chemical and Biological Defense Program for fiscal year 1997 only.

[b] The Technical Support Working Group is funded primarily through the Counterterror Technical Support Program within DOD. Our figures for the Working Group's budget only include funding originating in DOD for the Chemical, Biological, Radiological, and Nuclear Countermeasures Subgroup. Funding for fiscal years 2000-2001 assumes the same annual percentage change as that of total Working Group funding from DOD.

Sources: GAO compilation, as of July 1999, of data from DOD, Defense Advanced Research Projects Agency, and Department of Energy.

According to DOD, three key areas must be addressed in planning and implementing R&D for chemical and biological defense: (1) identifying, validating, and prioritizing chemical and biological threats; (2) delineating the capabilities needed to address those threats; and (3) allocating program resources to activities that develop those capabilities.[3] Assessing threats may involve multiple dimensions of a threat, such as which particular chemical or biological agents may be used, how they may be delivered, and who might be the perpetrators. Delineating capabilities requires risk-based assessments to determine what capabilities, such as the ability to detect biological agents, are needed to address the threat. Allocating program resources includes deciding what research, development, testing, and evaluation projects to fund and making sure that projects address needed capabilities. We have previously testified before this subcommittee that civilian programs to combat terrorism require threat and risk assessments to help determine program requirements and to target resources where most needed.[4] By coordinating analyses of threats and user requirements, military and civilian programs could preclude duplication, address research gaps, and identify research projects that might benefit from consolidation or collaboration.

SIMILARITIES EXIST AMONG FEDERAL NONMEDICAL R&D PROGRAMS

We found similarities in terms of the research and development activities[5] that the four federal R&D

[3] Other issues that DOD considers include their overall military vision, military concepts of operation, and opportunities stemming from technological advances.

[4] See *Combating Terrorism: Observations on Federal Spending to Combat Terrorism* (GAO/T-NSIAD/GGD-99-107, Mar. 11, 1999) and *Combating Terrorism: Observations on the Threat of Chemical and Biological Terrorism* (GAO/T-NSIAD-00-50, Oct. 20, 1999). For more details on threat and risk assessment, see *Combating Terrorism: Threat and Risk Assessments Can Help Prioritize and Target Program Investments* (GAO/NSIAD-98-39, Dec. 1, 1997)."

[5] Types of R&D activities are as follows:

- Basic research involves the investigation of fundamental scientific knowledge, such as the basic physical properties of chemical and biological agents.

programs engage in, the threats they intend to address, the types of capabilities they seek to develop, the technologies they pursue in developing those capabilities, and the organizations they use to conduct the work. For example, all four programs engage in applied research and initial prototype development. Moreover, two—DOD's and Energy's—engage in basic research.

With regard to threat, two of the programs (those in the Department of Defense and the Defense Advanced Research Projects Agency) focus principally on threats to the military, and two (those in the Department of Energy and the Technical Support Working Group) focus on threats to civilians. However, some threats to the military and to the civilian population are similar and may involve the same chemical or biological agents or the same perpetrators. For instance, assessments of both military and civilian threats include concerns about biological toxins such as ricin, biological pathogens such as anthrax, toxic industrial chemicals such as chlorine, and chemical agents such as sarin. The military has traditionally concentrated on the battlefield use of chemical and biological agents by enemy nation-states. However, it has recently expanded its assessment of potential perpetrators to include foreign terrorists—one of the primary concerns of civilian programs.

In addition, we found that these programs are seeking to develop many of the same capabilities and are pursing similar technologies to achieve those capabilities. For example, all four programs are pursuing capabilities to detect and identify biological agents, and three of the four programs are pursuing the capability to detect and identify chemical agents. A summary of the capabilities pursued by each

- Applied research refers to scientific investigation directed towards a technical goal, such as developing and evaluating the feasibility of proposed detection technologies. Applied research generally tests such technologies within a controlled laboratory environment.
- Prototype development is intended to show the practical utility and feasibility of a technology. In general, the initial prototype must be able to perform in an environment similar to that in which it will ultimately be used, though it may not be able to withstand all the stresses of operational use.

program is presented in figure 2. Furthermore, programs sometimes pursue similar technologies in developing these capabilities. Examples of technologies funded by both DOD and Energy include mass spectroscopy and flow cytometry, both of which may be used for detecting and identifying biological agents.

Figure 2: Chemical and Biological-related Capabilities Sought by R&D Programs

R&D area	DOD's Chemical and Biological Defense Program	Defense Advanced Research Projects Agency's Biological Warfare Defense Program	Department of Energy's Chemical and Biological Nonproliferation Program	Technical Support Working Group's Counterterror Technical Support Program
Biological detection and identification	X	X	X	X
Chemical detection and identification	X		X	X
Individual protection	X			X
Collective protection	X			X
Decontamination, restoration, and mitigation	X		X	X
Modeling and simulation	X		X	X
Other applied research (e.g., threat assessment, aerosol technology)	X		X	
Other basic research (e.g., aerosol science, genomic sequencing)	X		X	

Note: An **X** indicates that the program covers the specified capability, by either funding or soliciting for (e.g., through a broad agency announcement) R&D projects in that area. A blank indicates that the program does not cover the specified capability.

Sources: DOD, Defense Advanced Research Projects Agency, Department of Energy, and Technical Support Working Group.

Finally, these programs may contract with the same groups of laboratories to perform the research and development work. All four programs may contract with Energy's national laboratories, and these

- Two other types of R&D activities, conducted primarily by DOD, are Demonstration/Validation and Engineering and Manufacturing Development. These two activities are part of DOD's acquisition cycle, and include the testing and evaluation of technologies.

laboratories have been involved in multiple programs. DOD, Defense Advanced Research Projects Agency, and Technical Support Working Group programs also may contract with laboratories in DOD, industry, and academia.

CURRENT MECHANISMS MAY NOT FACILITATE EFFECTIVE COORDINATION OF R&D PROGRAMS

Although the four programs we examined currently use both formal and informal mechanisms for coordination, we found several problems that may hamper their coordination efforts. First, we found that participation in current coordination mechanisms, whether formal or informal, is inconsistent. Second, program officials cited a lack of comprehensive information on which chemical and biological threats to the civilian population are the most important and on what capabilities for addressing threats are most needed. More detailed information could help guide and coordinate R&D. Third, several programs do not formally incorporate existing information on chemical and biological threats or needed capabilities in deciding which R&D projects to fund. Because of these problems, these programs may not be developing the most important capabilities or addressing the highest priority threats.

Participation in Coordination Mechanisms Is Inconsistent

The four R&D programs we examined are coordinated through both formal and informal mechanisms. For example, the Counterproliferation Program Review Committee—which consists of representatives from DOD, Energy, and the intelligence agencies—is a formal mechanism that reviews and makes recommendations to Congress regarding programs addressing threats from nuclear, chemical, and biological weapons. According to officials involved in these four programs, informal coordination also occurs, through such means as informal briefings, scientific conferences, and participation in each other's planning and review meetings. We found, however, that participation in coordination mechanisms is inconsistent. For instance, the Counterproliferation Program Review Committee's

responsibilities include reviewing Energy's program aimed at chemical and biological threats to civilians. However, the Committee does not formally include representatives from the civilian user community. Nor have Energy's project planning and review processes involved potential civilian users. In addition, although Energy officials are invited to participate in R&D planning and review meetings of DOD's Chemical and Biological Defense Program, they have not consistently attended.

Comprehensive Information Is Lacking on Threats to Civilians and on Capabilities Needed to Address Those Threats

Program officials noted that they lack comprehensive information on civilian chemical and biological threats and on the capabilities needed to address civilian threats— information that could help guide and coordinate R&D. In our previous work on civilian programs to combat terrorism, we have found that these programs lack a comprehensive threat assessment for terrorist chemical and biological threats.[6] For instance, we reported that assessments of domestic-origin terrorists do not rank the specific chemical and biological agents that would most likely be used. By contrast, more detailed military threat assessments exist for chemical and biological threats from nation-states. In addition, specific chemical and biological agents are placed in priority categories that depend on the estimated likelihood of the threat.

Furthermore, the capabilities needed by civilian users are not well defined. We have previously reported that a standardized equipment list developed for civilian emergency response personnel is not based on a validated set of requirements or on a consensus in the civilian community on needed equipment.[7] Attempts to identify R&D needs to improve domestic capabilities to respond to chemical and biological incidents lack detailed performance specifications and do not incorporate threat analyses.

[6] See *Combating Terrorism: Need for Comprehensive Threat and Risk Assessments of Chemical and Biological Attacks* (GAO/NSIAD-99-163, Sept. 7, 1999), pp. 17-19.

By contrast, written specifications of military user needs and requirements are coordinated among the military services and are relatively detailed. For example, DOD's Chemical and Biological Defense Program initially identifies broad needs (such as "individual protection" or "contamination avoidance") from which it develops detailed system performance requirements based on analyses of threats and military missions.

Existing Information on Threats and Needed Capabilities Not Always Used to Determine Project Funding

Among the programs we examined, only DOD's Chemical and Biological Defense Program integrates formal threat assessment into its R&D activities. For instance, DOD's project review process includes a System Threat Assessment Report. This document describes the most important chemical and biological threats that military equipment being developed should address. By contrast, the other three programs do not utilize threat information to the same degree. According to program officials, the Defense Advanced Research Projects Agency's program is meant to address broad categories of threats or threats that are not yet present. As a consequence, their program uses threat information primarily for overall program planning. With regard to civilian programs, although the Energy and the Technical Support Working Group have incorporated threat assessments in overall program planning, the threat assessments are not project-specific.

Finally, the two larger R&D programs—in the Department of Energy and the Defense Advanced Research Projects Agency—do not formally incorporate existing information on user needs in deciding on which R&D projects to fund. Projects in the Energy program do not incorporate existing requirements developed by the Technical Support Working Group or the Institute of Medicine for

[7] *Combating Terrorism: Analysis of Potential Emergency Response Equipment and Sustainment Costs* (GAO/NSIAD-99-151, June 9, 1999).

civilian programs.[8] Similarly, projects in the Defense Advanced Research Projects Agency's program do not necessarily support a documented military need. By contrast, DOD's program has various mechanisms to tie its R&D projects to military needs. For example, DOD's program uses Defense Technology Objectives to specify a particular technology to be pursued and the specific military benefits of that technology. The Technical Support Working Group develops its own list of civilian user needs, which it uses to solicit R&D proposals.

Potential Benefits From Improving Coordination

As a result of these problems, R&D programs may not be developing the most important capabilities and addressing the highest priority threats.[9] To eliminate duplication, these programs need detailed information on civilian chemical and biological threats and the capabilities needed to respond to those threats. For example, after the four military services—which have such detailed information—began coordinating their chemical and biological defense efforts in fiscal year 1994 through DOD's Chemical and Biological Defense Program, they were able to consolidate 44 service-specific developmental efforts in the program's contamination avoidance research into 10 joint-service projects. Having comprehensive information can also help program officials determine whether critical gaps in research exist that could be filled by refocusing one or more programs.

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[8] A prioritized list of needs is developed by the Technical Support Working Group annually; and, in a recent Institute of Medicine study, *Chemical and Biological Terrorism: Research and Development to Improve Civilian Medical Response* (Institute of Medicine and National Research Council, National Academy Press, 1999), some nonmedical R&D needs were delineated.

[9] To facilitate coordination of R&D projects, DOD and Energy are planning on merging their R&D roadmaps through the Counterproliferation Program Review Committee, but this will not be completed for at least 1 year from now.

This 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 contributions to this testimony include Dr. Sushil K. Sharma, Dr. Weihsueh Chiu, and Dr. Jeffrey Harris.

(713051)

Mr. SHAYS. I would like to just ask you if the solutions are administrative or legislative to improving the coordination? And my second followup question is have we legislatively kind of reinforced the lack of coordination?

Mr. CHAN. I think over the years, since 1993, beginning with the bottom-up review, Secretary Aspin had noted this as one of those four major threats that is to be recognized. And there are a number of laws that have been passed over the years to encourage such activities, not only to provide threat and risk assessment as in the case that is directed, I believe, as Public Law 105–261, that the FBI does go and demonstrate the methodology in assessing threats and risk assessment, as well as the formulation of a number of these programs, as I stated in my oral statement, that are encouraged by Congress over the years to really develop these programs and try to, in fact, encourage them to address this threat.

Mr. SHAYS. But my sense is that you are not seeing the coordination you want to see, correct?

Mr. SHARMA. If I could just expand on to this, I think on paper the——

Mr. SHAYS. I just wanted to say, Mr. Chan, you sounded to me like Alan Greenspan then. I was trying to figure out what the answer was to my question there.

Mr. CHAN. I hope I am much younger.

I believe that, in fact, legislatively there has been a lot of action taken. Congress had encouraged them to do that, but nevertheless I think we are still finding problems out there.

Mr. SHAYS. OK, thank you.

Yes?

Mr. SHARMA. I think the coordination mechanisms on pieces of paper do exist. However, one of the problems we are seeing here is that no one is specifically responsible for ensuring that duplication would not occur, or in cases where duplication has occurred, nobody has the responsibility for saying no, or nobody is in charge of ensuring that if there are some specific gaps that exist, they do get addressed through the R&D programs.

Mr. SHAYS. Well, that is a pretty serious comment. It is helpful. I think we all experience this, but in my own office if three people are responsible for it, no one is responsible. So I always in the end say if this doesn't turn out the way it should, it is your fault, and I will point to one person. I might put it in the positive, but the bottom line is I always have one person ultimately responsible.

Your point is we don't have one person ultimately responsible, which begs the next question. Is that because no one wants to have to choose who ultimately is responsible or it is difficult to decide who should be?

Mr. CHAN. Well, I think in the past they believed there is a demarcation between the military needs versus the civilian terrorism needs.

Mr. SHAYS. Say that again.

Mr. CHAN. There seems to be in the past, I think, that each organization pursued their area according to their expertise. What I am trying to say is that the military traditionally had concentrated on the battlefield threat from nation states. However, over time, the concern about terrorism against the military are also increasing.

So while the threat itself is similar and overlap, the priority in addressing them might be different. There are common threats now.

Mr. SHAYS. Is this the concept of the stovepipe view of their mission?

Mr. CHAN. Well, that is a good way to put it, yes.

Mr. SHAYS. But I still need an answer to that question, and then I am going to turn to staff to ask some questions and I would like to listen to your responses and then I may jump back in. But, ultimately, I am assuming, Mr. Chan, that you agree with Dr. Sharma's assessment.

Given what Dr. Sharma said, do you think one person or one agency should be held accountable for the coordination of this effort?

Mr. CHIU. The National Academy of Sciences in looking at coordination of R&D has recommended that in cases where multiple agencies are conducting R&D, there should be a lead agency who is responsible for leading that coordination effort.

Mr. SHAYS. And have they suggested who it should be?

Mr. CHIU. They haven't addressed it in this particular arena. They addressed it on a broader level.

Mr. SHAYS. That is helpful. Thank you very much.

I am going to have both Larry Halloran, the majority staff counsel, and David Rapallo, the minority staff counsel, as some questions.

Larry.

Mr. HALLORAN. In your statement, you mentioned an alternative to a threat-driven R&D system was a technology-driven one. Did you come across an example of a technology that was kind of driving its own development process that had no user at the other end, a gizmo nobody asked for?

Mr. CHAN. Well, I I can approach it from the view that in the Department of Energy, when the program was in place the approach that was taken was looking at ways to maximize the utility and capability of the scientists that are there, how best to use them. And so in defining what the threat is and then see what the needs are, it went in a different direction, which is to optimize the utility of the people and their expertise.

Now, it may eventually converge to the same point, but nevertheless I think——

Mr. HALLORAN. With a lot of luck.

Mr. CHAN [continuing]. Our view is that it should start from a threat-driven approach, and then you assess the risk, then you prioritize the capability you need to achieve, and then ultimately decide where to go. It is a process issue that we are raising here.

Mr. HALLORAN. Right, and let's stay with the process. I know you didn't make formal recommendations in the report, but here you can. What would you see as a mechanism that might be used to develop requirements on the civilian side? I know DOD has a fairly complex requirements iteration process, and the civilian R&D side doesn't seem to have that. Is there a paradigm out there for coordination and for the requirements development process that they might look to?

Mr. CHAN. Well, I think the first observation one would make is that in DOD such a process is pretty well in place over time. I mean, this is something that they are used to, not only in addressing threats, but also developing a strategy by which you set requirements and the mission needs, as well as examining near-term, mid-term and far-term capability that might be needed, and then ultimately come out with so-called science and technology objectives, and so on. So the process itself within DOD is pretty well established.

With the civilian side, this is a very different demand to really try to figure out where to go. First of all, in the national response system under EPA in addressing chemical accidents both on the mobile and stationary side—that means transportation where you have accidents with chemicals—you do have the local emergency planning team there, and first responders, and so on.

Now, there is sort of an infrastructure available organizationally. Whether they are well trained to address not only chemical accidents, but all the way to the chemical agents, which is like warfare, and biological agents, that is clearly something new. And it is done in such a way that has always been with multiple-agency involvement, from the Department of Justice, involving the FBI, to EPA, to the cleanup problems, to even national labs doing analysis to figure out to what degree the civilian population might be affected if this happens. But it is not a very top-down way to approach the issue. So I think, you know, they are beginning to try to figure out how to do that better.

Mr. HALLORAN. One final question. You noted in your statement and in the report that you didn't see much success, maybe some effort in involving civil users in the coordination process. What was the reluctance or what, in your view, caused that to not work? They just didn't think of it, or they tried and failed?

Mr. SHARMA. One of the things that DOE officials told us the reason that, you know—I mean, they gave us two reasons, essentially, that nobody has done the threat assessment, and as far as the users are concerned they really don't know what they want, unlike DOD users.

I think it is partially true, but not correct in the sense that when you think about the civilian and military threats, there are artificially created boundaries. You do need some common things, such as detectors to detect what agents individuals have been exposed to, collective and individual protection systems, and decontamination systems. So these are sort of generic kinds of things, and DOD has years of experience.

Now, users, are very different. They are coming from different States, you know. They are first responders, police, firemen, and so on and so forth. But, basically, everybody has awareness within those three categories of what do they need. What DOE has not done is to make an effort to go beyond what their jurisdiction, which is, you know, they are supposed to do R&D and, you know, they are independent, instead of making an effort to try to reach them and try to do a systematic need assessment, as well as recognizing that R&D does not offer any immediate solution. So you must do an assessment of the available technology and say to the users, look, for specific threats for the time being you could use "x,"

"y" and "z," and here are some of the gaps that none of these currently available technologies could offer. Therefore, we are going to do the R&D.

So what I am saying is that DOE has to do two things. They have to do an outreach to the users and do some education at the same time in terms of what is available and what is not available, what they can use and work on, and go from there.

Mr. HALLORAN. Thank you, Mr. Chairman.

Mr. SHAYS. Thank you.

I will turn to Dave Rapallo.

Mr. RAPALLO. With the varied types of end users on the civilian side, what are some ways that agencies could solicit requirement information and other types of information from the end users?

Mr. Sharma. I think one of the processes is followed by TSWG, and they have a process whereby they invite responders from each State and it is an open meeting. That is one such area where DOE can expand on. I mean, it is not that there are no mechanisms available or it is impossible to do.

Mr. CHAN. But I think before you do that, you need to provide what are the likely threats to those people so that they can understand what they are. And, second, what are the priorities which ones are the most important ones. And, three, what kind of capability gaps do they have now in addressing those possible threats, and the likelihood of these threats and the lethality of these threats, and ultimately how best to be informed.

That way, they can say, hey, we don't have anything to do this, OK? So either you go out and say, OK, do we have current capability to address that or do we need to develop some kind of R&D program for a system or develop a technology by doing so.

I think the reason why we keep raising the question about the threats assessment is that we are seeing a tremendous overlap between the military side and the civilian side. There is no way to distinguish pretty soon, particularly in the chemical and biological arena. So in that case, the only real difference you find is the selection of the agents that might be of concern to the domestic side, and the priorities might be quite different than the military use of such weapons of mass destruction.

So they are different, except the threats are similar. And then I think with the knowledge the users have, that way at least they can sort of react to it, because if you go out there and ask them now, most likely they would just look at the current stuff based on the experience they have with chemical accidents.

Mr. RAPALLO. I just have one followup. Do you know the status of ongoing efforts for threat assessment at the civilian agencies, at FBI and other agencies?

Mr. CHAN. Yes. I think Public Law 105–261 which I commented on before directed the FBI to do a risk and threat assessment, and do some demonstrations. I think that is sort of the beginning of it. What we are looking for is ways to prioritize and then ultimately determine the capability and needs, and then develop future R&D programs out of that effort.

Mr. SHARMA. But we don't know whether or not they have actually done that.

Mr. SHAYS. I am sorry. I am not hearing you. Could you speak a little more into the mic?

Mr. SHARMA. Although the public act requires them to do it, our understanding is that they have not done that, and perhaps you can ask the FBI when they come next what their road map is with regard to the threat assessment.

Mr. RAPALLO. Thank you.

Mr. SHAYS. What will be the effect on chemical and biological defense projects if DOD and DOE merge their R&D road maps? What will be the effect?

Mr. SHARMA. I think if they do merge, one of the things will be that you will identify right away what are some of the projects that are duplicative, and you could then minimize or eliminate the duplication, especially if it is not planned duplication. And you could then curtail waste and use those resources to address more important questions that are not currently being addressed.

Mr. SHAYS. Did any of you look at how civilians view the technology, versus the military, the users? Do the civilians, for instance, have a lower tolerance for equipment functioning a certain way versus the military?

Mr. CHAN. Well, we did a study about 4 years ago. You are taxing my memory now. What we found, of course, is that on the civilian side they are less aware of the possible agents that could be used. And, second, they really have to rely on expertise that is in EPA, such as to identify agents. And often they are not really trained to know what to do. I am talking about, given the incident occurs, what follows. That is where it is wanting often.

Mr. SHAYS. What would be the most important question I could ask each of the next panelists?

Mr. CHAN. The most important question?

Mr. SHAYS. Yes. I am trying to get to the bottom line.

Mr. CHAN. I think the most important one is really ask them not to look from the agency's perspective what they are doing, but rather have them address it from the people's perspective in terms of the community; given these kinds of threats, what kinds of concerns they may have and what kinds of things they might need.

Instead of looking at it from the agency perspective, I think you have to sort of look at it from the user perspective because it is affecting the community and I think that needs to be represented in some form. But before they can respond to that, they need to understand what potential threat there might be. So you need to lay that out first and say, hey, this is what happens to you if this happens, then what would your needs be.

I think you get a lot of statements about this is my agency and this is how we are addressing that issue rather than——

Mr. SHAYS. So, in one sense, it is asking each of them who their customer is?

Mr. CHAN. Exactly.

Mr. SHAYS. And have them define to me who their customer is.

Mr. CHAN. That is the quick and short answer.

Mr. SHAYS. That is helpful.

Is there any comment that any of the three of you would like to make before we get on to the next panel?

Mr. SHARMA. One of the questions I would ask is how is the nature of the threat different between the military and civilian. An agent is an agent, and while the magnitude of the effect might be different in a battlefield scenario versus in a civilian exposure, basically you are dealing with the same category of agents. And how that threat would impact the R&D efforts—a second question is while DOD has been doing a lot of research over the years and has developed many technologies, and that expertise ought to be utilized and have some effect, positive contribution, on the civilian side. But maybe civilian agencies have done some assessment and they find what DOD has done is good for nothing. I don't know, but you could ask them.

Mr. SHAYS. OK, thank you.

Mr. CHIU. Following up on the customer issue, how they are going to ensure—once some of this threat assessment and risk assessment comes out, how will they ensure linkages between the various elements, between the threat and developing the capabilities and the R&D, because one of the things that we found was that there seemed to be some gaps in establishing those linkages.

Mr. SHAYS. Thank you.

We have been joined by the ranking member, Mr. Blagojevich, who serves on our Armed Services Committee as well.

I think you wanted me to go on to the next panel.

Mr. BLAGOJEVICH. Yes.

Mr. SHAYS. OK, so I thank all of you. As always, you provide very helpful information to our committee and a nice introduction to the next panel, so I thank you very much.

Mr. CHAN. Thank you.

Mr. CHIU. Thank you.

Mr. SHAYS. Let me just call the next panel and then I am just going to take care of some housekeeping.

We have Mr. Carmen J. Spencer, Director of Chemical and Biological Defense, Defense Threat Reduction Agency. I might just point out that I think Mr. Spencer is retiring, and I want the record to show he is not retiring because he came before this committee.

Dr. Page Stoutland, Director, Chemical and Biological Nonproliferation Program, Department of Energy; Dr. Donald M. Kerr, Assistant Director, Federal Bureau of Investigation Laboratory, Federal Bureau of Investigation; and Mr. Robert M. Burnham, Section Chief, Domestic Terrorism-Counterterrorism Planning Section, Federal Bureau of Investigation.

Before I ask you to stand up—don't stand up quite yet—I will just 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 Members be permitted to include their written statement in the record. Without objection, so ordered.

If you gentlemen would stand, I will swear you in, and then we will get started here.

[Witnesses sworn.]

Mr. SHAYS. Note for the record that all four witnesses responded in the affirmative.

I think you are seated the way I called you, and we will just go right down the line. We are going to turn the lock on for 5 minutes and then we will roll it over for another 5 minutes, so you have a sense of where we are at. But your testimony is very important, especially in areas that are pretty new to us and this is an area that is fairly new to us.

Mr. Spencer.

STATEMENTS OF CARMEN SPENCER, DIRECTOR, CHEMICAL-BIOLOGICAL DEFENSE DIRECTORATE, DEFENSE THREAT REDUCTION AGENCY; PAGE STOUTLAND, DIRECTOR, CHEMICAL AND BIOLOGICAL NONPROLIFERATION PROGRAM, U.S. DEPARTMENT OF ENERGY; DONALD M. KERR, ASSISTANT DIRECTOR, FEDERAL BUREAU OF INVESTIGATION LABORATORY DIVISION, FEDERAL BUREAU OF INVESTIGATION; AND ROBERT M. BURNHAM, SECTION CHIEF, DOMESTIC TERRORISM-COUNTERTERRORISM PLANNING SECTION, FEDERAL BUREAU OF INVESTIGATION

Mr. SPENCER. Mr. Chairman and distinguished committee members, I am honored to appear before your committee today to address your questions regarding the Defense Department's Chemical and Biological Defense Program.

I am Mr. Carmen Spencer, the Director of the Chemical and Biological Defense Directorate within the Defense Threat Reduction Agency. In this capacity, I am responsible for managing, directing and executing the armed forces joint NBC defense, research, development, and acquisition programs to ensure all our armed forces can survive, fight and win on a battlefield contaminated with chemical or biological weapons.

The Department's Chemical and Biological Defense Program is threat-driven; it is not technology-driven. The chemical and biological weapons threat is potentially increasing in diversity and frequency. Currently, there are over 20 countries with known or suspected chemical and biological weapons programs. Assessing the threat is complicated by several interrelated changes, including the proliferation of weapons, technological advances, unstable political regimes, shifting regional power balances, and the increasing threat of terrorism.

The continued frequent deployment of U.S. forces worldwide makes assessing the threat more difficult. Further, because the countries which are of the greatest concern to the United States are also in regions in which the United States has well-defined national security interests, it is of paramount importance that we continue to maintain a credible, robust capability to protect our forces and provide them capabilities to operate effectively in a chemical or a biologically contaminated environment.

The chemical and biological threat drives warfighting commanders and CINCs and services requirements. The CINCs and services identify the capabilities needed to survive, fight and win. These identified capabilities form the basis for all requirements for the research and acquisition community. The Defense Intelligence Agency provides us with continually updated reports and assessments.

These reports assess the effect of adversaries' weapons systems on how we fight.

The commanders-in-chief identify their priorities which are supported by our joint NBC defense program. Our joint user community evaluates materiel, training and doctrinal improvements to provide the necessary capabilities for our warfighters. If a materiel solution becomes necessary, the joint user community generates requirements in the form of mission needs statements and joint operational requirements documents. The result is that our programs and technologies are driven by validated threat assessments and user mission requirements, not by technologies.

Our Chem-Bio Defense Program coordinates with several relates efforts, including the Defense Advanced Research Projects Agency [DARPA]; the Department of Energy; the Department of Health and Human Services. And we have many international cooperative efforts.

DARPA is charged with seeking breakthrough concepts and technologies. DARPA's biological warfare defense program is intended to complement the DOD Chem-Bio Defense Program by anticipating threats and developing novel defenses against them. The Chem-Bio Defense Program has programmed funding to facilitate the transition to acquisition of any demonstrated DARPA technologies that may meet warfighter needs.

The Department of Energy initiated an effort to develop chemical and biological defensive capabilities for first responders and protection against terrorism attacks within the United States. The Department of Defense program has leveraged the Department of Energy program by funding specific DOE efforts that may have military applications.

Additionally, coordination is achieved by the Department of Energy participation as a non-voting member of our Joint NBC Defense Board, DOE participation in the Chem-Bio Defense Program science and technology reviews, and regular meetings with the Department of Energy and visits to their national laboratories as well.

The Department of Defense's Chemical and Biological Defense Program and DARPA and the Department of Energy's Chemical and Biological Nonproliferation Program have worked together to provide a report to Congress on our cooperative work in chemical and biological defense science and technology. It is prepared through an interagency coordination mechanism known as the Counterproliferation Program Review Committee Focus Group, which involves the Department of Defense, the Department of Energy, and the intelligence community.

The Department of Defense also participates in the National Security Council-led Weapons of Mass Destruction Preparedness Group, which coordinates activity in the U.S. Government toward preventing, detecting and responding to terrorist release of weapons of mass destruction, and toward more effectively managing the health, environmental and law enforcement consequences of such an incident.

This body does not address or oversee the DOD Chem-Bio Defense Program's mission of providing the warfighter with the capability to operate effectively in a chemical and biological-contaminated environment. However, technology development efforts with-

in the Department of Defense, including the Chemical and Biological Defense Program, that can contribute directly to the domestic preparedness mission are coordinated with other agency programs through this R&D subgroup which is chaired by the White House of Science and Technology Policy.

The Department's fiscal year budget request for the Department of Defense Chem-Bio Defense program is approximately $836 million. This is an increase of over $100 million from fiscal year 2000. $362 million is being applied for research, development, test and evaluation, and $474 million will go toward providing equipment to our warfighters.

In summation, the Department of Defense Chem-Bio Defense Program responds to the threat-requirements-programs process. Programs are in place to respond to user needs and shortfalls. Oversight and management of the Department of Defense Chem-Bio Defense Program continues to improve and does comply with Public Law 103–160. The Department is on the right azimuth for fielding needed, improved chem-bio defense equipment to our armed forces to meet warfighter needs. The continued support of Congress and implementation of current plans will continue to improve joint force readiness.

Thank you very much.

[The prepared statement of Mr. Spencer follows:]

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STATEMENT OF

MR. CARMEN SPENCER

DIRECTOR, CHEMICAL-BIOLOGICAL DEFENSE DIRECTORATE, DEFENSE THREAT REDUCTION AGENCY

DOD CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM

ON

MARCH 22, 2000

BEFORE THE

SUBCOMMITTEE ON NATIONAL SECURITY, VETERANS AFFAIRS, AND INTERNATIONAL RELATIONS HOUSE GOVERNMENT REFORM COMMITTEE

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INTRODUCTION

Chairman and Distinguished Committee Members, I am honored to appear before your Committee today to address your questions regarding the Department's Chemical and Biological Defense Program. I am Mr. Carmen Spencer, Director of the Chemical-Biological Defense Directorate within the Defense Threat Reduction Agency.

I. DoD Chemical and Biological Defense Program Overview

The Chemical/Biological Threat

The chemical and biological weapons threat is potentially increasing in diversity and frequency. Currently, there are over twenty countries with known or suspected chemical and biological weapons programs. Assessing the threat is complicated by several interrelated changes, including the proliferation of weapons, technological advances, unstable political regimes, shifting regional power balances, and the increasing threat of terrorism. The continued frequent deployment of U.S. forces worldwide makes assessing threat more difficult. Further, because the countries which are of the greatest concern to the United States are also in regions in which the United States has well defined national security interests, it is of paramount importance that we continue to maintain a credible, robust capability to protect our forces and provide them capabilities to operate effectively in a chemical or biological contaminated environment.

Threat, Requirements, Programs Process

The Department's Chemical and Biological Defense Program is threat-driven, not technology-driven. The chemical and biological threat drives the user to identify requirements, and the capability needed which in turn forms the basis for requirements for the research and acquisition community. The Defense Intelligence Agency provides us with continually updated reports and assessments. These reports assess the effect of adversaries' weapon systems on how we fight. The Commander's-in-Chief identify their priorities for counterproliferation capabilities, which are supported by the NBC Defense program. Our joint user community under the leadership of the Joint Service Integration Group (JSIG) evaluates materiel, training, and doctrine improvements to provide the necessary capabilities to the warfighter. If a materiel solution becomes necessary, the JSIG generates requirements in the form of Mission Needs Statements and Operational Requirement Documents. The result is that our programs and technologies are driven by validated threat assessments and user mission requirements, not by technologies.

Proposed materiel solutions must compete for the limited Department funding available for chemical and biological defense. Proposed projects are brought on an annual basis to the Joint Nuclear, Biological, and Chemical Defense Board (JNBCDB) comprised of voting members from each service for prioritization. All research, development, and acquisition (RDA) programs are ranked according to the warfighting priority with significant input from the Office of the Joint Chiefs of Staff into a single medical and non-medical priority list. The annual

prioritizing by the user community becomes the baseline for all Chemical and Biological Defense Program planning and budgeting for the Program Objectives Memorandum (POM) and the President's Budget submission.

The Chemical and Biological Defense Program consists of all Department research, development, and acquisition efforts to develop and procure systems designed to provide U.S. Forces with the ability to operate effectively in the presence of chemical and biological agents. The Department's fiscal year 2001 (FY01) budget request for the DoD Chemical and Biological Defense Program is approximately $836M (an increase of over $100M from FY00): $362M for research, development, test & evaluation (RDT&E), and $474M for procurement. The RDT&E resources allow continuation of research programs and permit important technology base research work to continue on high priority areas to produce us with next generation CB defense capabilities. All RDT&E work is directed by the warfighting community through the articulation of Joint Warfighter Future Operational Capabilities.

Joint and Service unique RDA efforts are structured to support the framework of four Joint Future Operational Capabilities and mission areas of CB defense: *contamination avoidance* (detection, identification, and reconnaissance), *NBC battle management* (modeling & simulation and warning & reporting), *force protection* (individual, collective, and medical support), and *decontamination*. The programs provide the best available technology to all joint warfighting capabilities by providing an integrated system of systems on the battlefield. When technology is limited, the Chemical and Biological Defense Program charts a phased development program that provides warfighters equipment immediately with provision made to upgrade or replace them with better systems as they become available. It is essential to view all CB defense programs as an integrated system, with each mission area important to the joint forces' survival. Our forces need the full spectrum of defensive equipment to survive, fight, and win in a contaminated environment. For example, protective clothing may be of little value if we don't provide the appropriate detection and warning systems, nor would warning systems be of much use without protective systems to react to the warning.

II. DoD Chemical and Biological Defense Program Management

Public Law 103-160, (Section 1701) of the National Defense Authorization Act For Fiscal Year 1994, directed 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) 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 NBC defense readiness and plans to improve the program.

The Department has implemented all Public Law 103-160 requirements. The implementation of the public law has provided the catalyst for major improvements in the Chemical and Biological Defense Program; it has led to increased cost effectiveness, greater jointness, improved execution of the program, and more robust funding for chemical and biological defense. 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.

The Deputy Assistant to the Secretary of Defense for Chemical and Biological Defense, Dr. Anna Johnson-Winegar—DATSD(CBD)—is the focal point within the Department for the CBD program. The DATSD(CBD) is responsible for the oversight, coordination and integration of all CB defense medical and non-medical acquisition efforts, and provides the overall guidance for planning, programming, budgeting, and executing CB defense programs. The DATSD(CBD) remains the single office within OSD responsible for oversight of the DoD CB Defense Program.

The DATSD(CBD) is also the Executive Secretary of the OSD CB Defense Steering Committee. The Steering Committee enables the multiple specialized chemical and biological defense organizations in the Department of Defense to provide direct oversight of the DoD Chemical and Biological Defense Program. The OSD CB Defense Steering Committee is composed of the following members:

(1) Director, Defense Research and Engineering;
(2) Director, Defense Threat Reduction Agency (DTRA);
(3) Deputy Assistant to the Secretary of Defense for Chemical and Biological Defense, (DATSD(CBD)); and
(4) Office of the Joint Chiefs of Staff, Deputy Director Strategic Plans and Policy (J-5); and
(5) Director, CB Defense Directorate, DTRA, (DTRA/CB).

The USD(AT&L) is the senior DoD official responsible for the CBD program. The Steering Committee provides the fiscal and programming guidance to the JNBCDB to develop the POM. The Joint NBC Defense Board issues POM Preparation Instructions to the subordinate groups who review the validated requirements and build the POM strategy recommendations. The CB Defense Program is divided into the following commodity areas: contamination avoidance, individual protection, collective protection, decontamination, medical chemical defense, medical biological defense, and modeling & simulation. These commodity areas correspond to the 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 CINC requirements and priorities for RDT&E and initial 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 CB Defense Steering Committee may make adjustments 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 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. Each Service has been assigned the lead for the following commodity areas:

- Army—contamination avoidance and medical programs;
- Marine Corps—individual protection;
- Navy—collective protection; and
- Air Force—decontamination.

III. The Process in Action: Development of Biological Integrated Detection System (BIDS)

As a brief illustration of how this process performs in action, I would like to describe the development of the Biological Integrated Detection System (BIDS) from the call from the field to delivery to the warfighter.

Operation Desert Storm identified a major deficiency of U.S. forces to effectively detect and identify biological warfare agents. There was no type classified biological detection system available to U.S. forces. Methods of the time relied on accurate intelligence, analysis of suspicious munitions or events, time consuming laboratory analysis, and the onset of illness among U.S. forces before a biological attack could be detected. National Military Strategy

exacerbated the deficiencies identified during Operation Desert Storm, as the strategy specified a worldwide force projection capability requiring biological warfare detection in order to protect the force against potential threats.

The Chairman, Joint Chiefs of Staff directed the Joint Requirements Oversight Council to review and validate a Mission Needs Statement for a DoD Biological Defensive capability in August 1992, which led to a comprehensive DoD Biological Defense Program in the second quarter 1993. This program addressed both point and early warning detection of biological warfare agents. The U.S. Army Chemical School prepared a more specific Operational Requirements Document for BIDS, which the U.S. Army Training and Doctrine Command approved in June 1993. The Operational Requirements Document addressed the urgency of the near-term need. The adopted acquisition strategy was to field a BIDS non-developmental item (NDI), as Phase I, and identified follow-on phases to meet the user objective.

Once the requirement for biological detection was identified, the Army prioritized it against other Army requirements for the necessary resources. After the passage of Public Law 103-160, the Joint Chemical and Biological Defense Program prioritized this program within the available departmental funds. Through the coordination of the Joint program, the final phase of the BIDS development was completed as a cooperative Army and Marine Corps program.

The Army's BIDS consists of a shelter (S-788 Lightweight Multipurpose Shelter) mounted on a dedicated vehicle (M1097 Heavy High Mobility Multipurpose Wheeled Vehicle (HMMWV)) and is equipped with a biological detection suite employing complementary technologies to detect large-area biological attacks. The system includes a trailer-mounted 15-kilowatt generator to provide electrical power. To ensure uninterrupted operation for at least three days, the complete BIDS system is deployed with a second HMMWV that is used as a support vehicle (to carry additional spares and repairs, and to courier suspect samples to a collection point), and also carries two of the four-man crew.

To meet the immediate need for a biological warfare detection capability, yet take advantage of maturing technologies, the BIDS has taken an evolutionary acquisition approach. Phase I of the BIDS, the non-developmental item (NDI) version, consists primarily of commercial off-the-shelf items. The NDI system is completely manual. The Phase II follow-on system to the BIDS NDI is the BIDS pre-planned product improvement, type classified as the M31A1 BIDS. The M31A1 BIDS P3I has an expanded, semi-automated detection/identification capability. The BIDS P3I also replaces much of the manual immunochemistry with an automated instrument. For comparison, the BIDS NDI costs roughly $1 Million per system and the BIDS P3I costs roughly $1.2 Million. The estimated operating costs of the BIDS NDI in peacetime is $800 per day per system and in wartime $1,425 per day per system.

The BIDS NDI was fielded to the US Army 310th Chemical Company (Reserve) in 1996. The second BIDS Company, equipped with the M31A1 BIDS, was fielded to the 7th Chemical Company (Active) in 1999.

The final phase of BIDS is the fielding of the Joint Biological Point Detection System, a much-improved biological detection suite that will be inserted into the BIDS platform, type

classified as the M31A2 BIDS. This final BIDS system will meet all the desired objectives of the warfighting community stated in the 1993 Operational Requirements Document for biological detection. The BIDS M31A2 will be fielded to a second active biological detection company in FY2001.

The BIDS is designed for defense against the most catastrophic of biological warfare attacks—a long line source. The doctrinal employment concept for the BIDS is to deploy one company of 35 BIDS to an Army Corps or a Joint Task Force. The BIDS systems are then deployed throughout the Corps' area to create a wide area sensor array/network. Any detection is reported directly to company headquarters, which is collocated with the Corps (or Joint Task Force) headquarters. The team consisting of the BIDS Company Commander, Corps Chemical Officer, and Corps Surgeon then determine if, in fact, a biological warfare attack has taken place (as opposed to a single system alert being due to local fluctuations—a false positive). If the determination is that an attack has occurred, then appropriate warning and post attack actions are executed.

While BIDS provides the most advanced operations-level detector available to the force, it is hoped that as system weights and power requirements are reduced, BIDS technologies may be integrated into a single nuclear, biological, and chemical reconnaissance system. Such integration is possible in the far-term given steady progression and investment in research.

IV. Chemical and Biological Defenses: Progress since Operation Desert Storm

Much of the emphasis on chemical and biological defense came from critical deficiencies reported during and after Operation Desert Storm. The Department's Chemical and Biological Defense Program was established to address these deficiencies and field improved systems to enhance our Force's capabilities.

Operation Desert Storm demonstrated particular shortfalls in biological detection. However, today limited biological point detection for fielded forces, coverage of key air fields, sea ports and logistics staging areas, and standoff detection of aerosols is available. Improvements necessary to meet operational needs are directing the fielding of improved early warning and point detection with greater sensitivity and agent identification.

Shortfalls identified in chemical detection during Operation Desert Storm were operationally significant, but did not present the technological challenges of biological detection. The current efforts of the program in chemical detection focuses on fielding improved point and stand-off detection systems to provide full coverage for individuals, ships, and aircraft with better reliability, sensitivity, and additional agent detection capability. Future improvements will also include detection of low-levels of chemical agents, detection of a broader number of chemicals (including some toxic industrial chemicals), programmable detection systems capable of being upgraded to meet changing threat requirements, and reduced size and weight to allow for a greater variety of applications.

Significantly lacking during Operation Desert Storm was an integrated warning and reporting system that would provide commanders a clear battlefield picture and enable them to make well supported decisions. The current reporting and warning system is limited to manual systems with no integration into existing command, control, and communication systems and limited battlefield awareness software for timely, accurate incident display. We began fielding an innovative program to provide digitized and automated warning and reporting capabilities. This system will be improved and integrated into command, control, and communications systems through an evolutionary procurement process--keeping the best available equipment in the hands of the warfighter.

Since Operation Desert Storm, one of the most significant areas of improvement was the fielding of improved individual protective clothing that reduces heat and mobility burdens on the warfighter and extends previous suits' shelf lives. Future protective clothing ensembles will provide lighter weight, and more durable and washable clothing that ultimately can be integrated into the standard duty uniform to provide for continuous protection. Additionally, we are pursuing a Joint Service General Purpose Mask for all Service applications that will be compatible with weapons systems, optical, and communication systems. These protective suits and masks will be supplemented and supported by improvements in collective protection with reduced logistical burdens to enable warfighters to recover and rest from CB attack.

Medical countermeasures for chemical and biological threat agents are limited but improving. Vaccines are the most effective and least costly protection from biological agents. A notable achievement has been the initiation of the anthrax vaccinations of the entire force. Since U.S. forces may be deployed worldwide on short notice and since an enemy may strike deep behind the front lines using terrorists or ballistic missiles, it is imperative to protect all U.S. forces. We know that anthrax exists this very day as a weaponized agent in the arsenals of countries hostile to the United States. As such, it presents a clear and present danger to U.S. Forces around the world. Total force vaccination is essential since full immunity takes about 18 months. To date, our Servicemen and Servicewomen have received nearly 1 million anthrax immunizations, and while side effects do occur in some people, they tend to be temporary, confined to the area around the injection, and mild or moderate in most people. Anthrax is lethal to approximately 95 percent of personnel exposed as compared to those not protected with the vaccine. With the vaccine, fatalities can be expected to drop from 95 percent of personnel exposed to less than ten percent.

V. Future Chemical and Biological Defenses

Following is a summary of key capabilities that are planned for procurement over the future years defense plan in each of the commodity areas within the Chemical and Biological Defense Program

CONTAMINATION AVOIDANCE MODERNIZATION STRATEGY:

The increased lethality and heightened operational tempo of future battlefields, demand responsive detection and warning capabilities to reduce force degradation caused by

contamination. These capabilities, which also encompass reconnaissance, identification and reporting, are given high priority within the CB Defense Program for force readiness.

Early detection and warning is key to avoiding contamination. As a result, CB defense research, development and acquisition efforts are concentrating on providing its warfighters real-time capabilities to detect, identify, locate, and warn against all CB warfare threats below threshold effects levels. Current emphasis is on multi-agent sensors for biological agent detection and stand-off/remote/early warning detection of chemical and biological agents. To meet the needs of the next three to five years, stand-alone detectors and sensors are being developed for a number of applications. As detection technology matures, development efforts will focus on system miniaturization and improved sensitivity and range, reduced false alarm rates and decreased operations and support costs. This focus will integrate CB detection into personal warfighter gear (chemical detectors only) and onto various air, sea, and ground platforms, and will permit CB warnings and messages to be transmitted to commanders throughout the theater via automatic digital communication systems.

Currently fielded biological standoff detection is based on backscatter within the infrared portion of the electromagnetic spectrum. Development work includes approaches for agent identification using fluorescence within the ultraviolet region. New approaches are examining alternatives to standoff identification of biological agents. For example, microwaves may allow agent identification based on molecular rotations; millimeter waves may allow identification based on phonon modes and lattice vibrations; and sub-millimeter through infrared may allow a combination of analytical approaches.

New approaches focus not on individual (and usually expensive) point detectors, but rather a network of lower cost point identification systems that will increase reliability over any one sensor, improve warning, and allow for forecasting of hazards.

Over the past four years, the Joint Program Office for Biological Defense (JPO-BD) has managed several single-service and joint biological detection programs. Three single-service biodetection programs have been fielded, which include:

- the Navy's Interim Biological Agent Detector (IBAD);
  25 ships were equipped throughout FY96–99,
- the Army's Biological Integrated Detection System - Non-Developmental Item (BIDS NDI), which was fielded to the 310th chemical company (US Army Reserves),
- the Army fielded the P3I BIDS to the 7th Chemical Company significantly enhancing the capability to detect and identify biological weapons, and
- the Army's Long Range Biological Standoff Detection System (LR-BSDS NDI), which was also fielded to the 310th chemical company (3 systems).

Key joint systems JPO-BD manages include:

- the Army's Biological Integrated Detection System, Pre-Planned Product Improvement. This program provides increased automation, doubles the number of agents detected and identified (8 *vs.* 4) and reduces identification time (<30 min).

- the Joint Biological Point Detection System (JBPDS) which entered the engineering and manufacturing development (EMD) phase in FY97. The JBPDS will be the first truly joint biological detection acquisition program that is built on an approved joint operational requirements document.
- The air Base/Port Bio Detection (Portal Shield) Advanced Concept Technology Demonstration (ACTD) which has been deployed to key air fields, including several in Korea.
- the Joint Biological Remote/Early Warning System (JBREWS) ACTD which started development in FY98.

Over the past three years, the JSMG and JSIG, through the contamination avoidance commodity area manager, with assistance from JPO-BD transformed and consolidated 44 separate contamination avoidance developmental efforts into nine fully coordinated joint projects. The joint programs are:

- Automatic Chemical Agent Detector Alarm
- Joint Chemical Agent Detector
- Joint Service Lightweight Standoff Chemical Agent Detector
- Joint Service Chemical Warning and Identification LIDAR Detector
- Joint Biological Point Detection System
- Joint Biological Remote Early Warning System
- Joint Service Light NBC Reconnaissance System
- Joint Warning And Reporting Network
- Joint Service Agent Water Monitor

FORCE PROTECTION MODERNIZATION STRATEGY:

Forces cannot always avoid NBC hazards. Therefore, individual warfighting units must be provided clothing and equipment to protect them from effects of these lethal agents. Protection must be effective against all known threats and not measurably degrade the performance of personnel, weapons, or equipment. Total NBC protective measures, which consist of individual and collective protection, allow joint forces to maintain operational tempo in a contaminated environment.

The goal of the protection area is to provide equipment that allows U.S. Forces to operate in a contaminated environment with minimal degradation of the warfighters' performance. Current programs are aimed at maintaining protection levels while reducing physiological and logistical burdens.

Individual protective equipment (IPE) consists of eye, respiratory, and skin protection, a mask with hood and protective garments, boots, and gloves. The IPE issued to joint forces protects against all known threat chemical and biological agents. Its capabilities against chemical agents are routinely demonstrated with actual agents in the Chemical Defense Training Facility (CDTF), Us Army Chemical School, which has recently completed its move to Fort Leonard Wood, Missouri.

Protective masks will be improved to provide greater user comfort and maintainability and reliability under field conditions and to reduce the breathing resistance currently encountered. Mask systems will require increased survivability and compatibility with combat weapons systems optics or personal equipment. Future respiratory systems, such as improved air force and army aircraft masks, will require enhanced compatibility with both life support and tactical systems on fixed and rotary wing aircraft. In the future, the focus will be on integrated respiratory protective ensembles that offer optimal compatibility with personal, tactical and crew support systems.

Future protective clothing ensembles will be required for land, sea, air, and marine forces to achieve reductions in bulk and weight with minimum loss of protection or durability. To satisfy these needs, the four services have consolidated their mission specific requirements into a first truly joint evaluation program for the next generation chemical protective garments—the Joint Service Lightweight Integrated Suit Technology (JSLIST) program. New accessories, such as gloves and footwear, are also required to execute missions and tasks which require greater tactility and traction. The Joint Protective Aircrew Ensemble (JPACE) will be developed to provide aviators the same advantages and improved protection as JSLIST provides to other warfighters.

Collective protection equipment (CPE) development efforts are focused on protection systems at the crew, unit, ship, and aircraft level which are smaller, lighter, less costly and more easily supported logistically. New systems are required to make "clean" environments available for critical operations, *i.e.,* where IPE would place an unacceptable burden upon the service member in performing duties and to provide essential rest and relief. Modernization concentrates on: (1) improved air filtration methodologies, (2) advanced technologies integrated into power and ventilation for systems that offer a significant improvement in logistics, (3) applications on essential vehicles, vans and shelters (4) improvements to current shipboard filters to extend filter life, and (5) benefit applications on essential spaces on ships. Efforts are underway to support major weapons systems developments, such as the V-22 Osprey, the Comanche, the Crusader, USMC Advanced Amphibious Assault Vehicle, aircraft, and armored systems modernization.

CB DEFENSE MEDICAL SUPPORT MODERNIZATION STRATEGY:

DoD maintains a robust medical research and development program for CB defense. This program has resulted in the fielding of numerous products to protect and treat service members. Specific initiatives programmed to improve CB medical readiness include:

- Continued emphasis on NBC medical countermeasures research
- A biological defense immunization implementation plan
- Medical collective protection
- Enhanced medical diagnosis of exposure to agents

The countermeasures for chemical agents include pharmaceuticals, medical equipment, specialized materiel or medical procedures, and concepts for training, doctrine, and organization. Medical countermeasures are designed not only to prevent lethality, but also to preserve and

sustain combat effectiveness in the face of combined threats from chemical and conventional munitions on the integrated battlefield by:

- Prevention of the effects of chemical agents (*e.g.*, pretreatments, prophylaxis, topical protectants);
- Far-forward treatment upon exposure to chemical warfare threats (*e.g.*, antidotes),
- Chemical casualty care (*e.g.*, diagnosis, therapy and management).

In accomplishing the goals of the medical biological defense research program, efforts are focused on three objectives:

- Prevent casualties with medical countermeasures (through the use of vaccines, drugs, and other medical treatments);
- Diagnose disease (through the use of forward deployable diagnostic kits and confirmation assays); and
- Treat casualties to prevent death and maximize return to duty (through the use of antitoxins, drugs, and other medical treatments).

Critical elements of medical biological defense include the ability to rapidly identify an agent and to provide prophylactic and/or therapeutic protection from the agent. Often, the most effective countermeasure is pre-deployment active immunization.

The current program includes the following research areas for the development of medical biological agent countermeasures:

- Characterize molecular biology and physiology of biological threat agents;
- Investigate the pathogenesis and immunology of the disease;
- Determine the mechanism of action of the threat agent through modeling;
- Identify new medical biological defense products by understanding their interaction with and mechanisms of action against bio warfare agents
- Establish safety and efficacy data for new medical bio defense products
- Establish the validity of new medical bio defense products against battlefield use.

There has been significant progress within the area of biological defense vaccine policy and development. The department has established policy, responsibilities, and procedures for stockpiling biological agent vaccines and determined which personnel should be immunized and when the vaccines should be administered. DoD has also identified biological agents that constitute critical threats, and determined the amount of vaccine that should be stocked for each. The Department awarded a Prime Systems Contract in November 1997 to manage advanced development of bio defense products, obtain FDA licenses and produce vaccines using the U.S. pharmaceutical industrial base. The prime contract approach has the advantage of flexibility and allows the market to respond to DoD requirements. RDT&E efforts are underway to develop vaccines against all validated threat agents. Multi-agent vaccine candidates are also being developed that will protect against three or more threat agents.

Through bioengineering efforts in the technology base, human butylcholinesterase enzyme has been genetically altered to a form that selectively hydrolyzes nerve agents, and thus prevents the acetylchoinesterase inhibition that would normally occur following nerve agent exposure.

Basic science efforts are providing information on the mechanism of action for sulfur mustard (HD). This knowledge led to the development of strategies to counter vesicant agents both before and after exposure to agents. For example, there are first-time treatments to prevent DNA alkylation, proteolytic activation and other mechanisms that cause damage at a biochemical level.

Advances in computer technologies have allowed for the ability to create 3-dimensional designs of individual molecules. This level of detail allows for accurate study, which in turn provides the scientific basis for the development of accurate detection of various agents and for the development of effective and safe vaccines.

DECONTAMINATION MODERNIZATION STRATEGY:

Decontamination systems provide a force restoration capability for units that become contaminated. Existing capabilities rely upon the physical application and rinse down of decontaminants on contaminated surfaces. Existing systems are effective against a wide variety of threat agents, yet are slow and labor intensive, and present logistical, environmental, and safety burdens and cannot be used on sensitive electronic equipment. To improve capabilities in this functional area, the joint services place emphasis upon new decontaminating technologies and materiel, which reduce existing manpower and logistics requirements. They are safer to the environment, the warfighter, and equipment.

Serving in a program oversight capacity, the 1998 Defense Technology Area Reviews and Assessment (TARA) process recommended that a structured technology base program be generated to address the growing CB decontamination technology issues. In response to this request a Front End Analysis (FEA) and Master Plan to identify, evaluate, and prioritize the application of CB decontamination technology efforts was conducted. The FEA was User driven in addressing future operational capabilities in five functional areas. From the FEA the Master Plan was built and exhibited a road map for the transition of identified decontamination technologies.

The goal of the CB decontamination program is to provide technology that removes and detoxifies contaminated material without damaging combat equipment, personnel, or the environment. Research and development of non-corrosive, all-agent multipurpose decontaminants and decontaminating systems for combat equipment, cargo aircraft and ships, personal gear, and skin remains a priority. Alternative technologies, such as sensitive equipment decontamination methods and large scale automated decontamination systems, and catalytic coatings and sorbents, attract strong interest across the four services. Large area decon systems are needed to support our power projection strategy into foreign airports or seaports, which may be targeted for CB contamination.

The Army has developed the M291 skin decontamination kit as a replacement to the M258A1 decontamination kit for all services, and is currently introducing the M295 for improved personal equipment decontamination. The M295 provides the warfighter a fast and non-caustic decontamination system for personal gear. A new adsorbent that is more reactive and has higher capacity is being developed to improve the performance of the M295 kit.

In the near- and mid- term, DoD continues to research new multi-purpose decontaminants as a replacement for bulk caustic decontamination solution 2 (DS2) and corrosive super tropical bleach. New technologies, such as sorbents, enzymatic foams, and reactive decontaminating systems are being explored and may offer operational, logistics, cost, safety, and environmental advantages over current decontaminants. It should be noted that present shipboard chlorine-based decontaminant solutions pose an unacceptable corrosion risk to naval aircraft. Current procedures require the use of fresh water and normal aircraft detergent solutions.

In the far-term, the services are seeking non-aqueous decontamination systems to provide for sensitive equipment decontamination at mobile and fixed sites. Additionally, there is interest and research in coatings which can reduce or eliminate the necessity of manual decontamination.

V. Chemical and Biological Defenses: Areas of Future Emphasis

Two subordinate groups support the Joint NBC Defense Board. The Joint Service Integration Group (JSIG) is responsible for identifying Joint CBD requirements and priorities, and for overseeing the development of appropriate training and doctrine. The JSIG also coordinates with the Joint Staff Joint Warfare Capability Assessment process to identify vulnerabilities and prioritize requirements. The Joint Service Materiel Group (JSMG) is responsible for identifying materiel solutions to the requirements and coordinating and integrating research, development and acquisition efforts. These groups perform the planning and programming functions for CBD research, development and acquisition and submit appropriate documentation to the Office of the Secretary throughout the Planning, Programming, Budgeting System (PPBS) cycle. Based on the Joint Warfighting Capability Assessment, CINC priorities, Joint Future Operational Capabilities, and other information, the following areas are of future emphasis:

- Improved biological detection capabilities;
- Integrated sensors and C4I;
- Improved capabilities for protection of fixed sites;
- Improved decontamination technologies;
- NBC contamination survivability for fielded systems;
- Leveraging industrial base for improved drugs, vaccines, and diagnostics; and
- Additional multipurpose licensed medical products (e.g., polyvalent vaccines).

VI. DoD Chemical and Biological Defense Program: Coordination with Related Efforts

The CB Defense Program is coordinating with several related efforts, including the Defense Advanced Research Projects Agency (DARPA), the Department of Energy (DOE), the Department of Health and Human Services (HHS), and international cooperative efforts.

DARPA is charged with seeking breakthrough concepts and technologies. DARPA's Biological Warfare Defense Program is intended to complement the DoD CB Defense Program by anticipating threats and developing novel defenses against them, and pursues 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 may meet warfighter needs.

The Department of Energy initiated an effort to develop chemical and biological defenses capabilities for first responders and protection against terrorist attacks within the United States. The DoD CB Defense Program has leveraged the DOE program by funding DOE efforts that may have military applications. Additionally, coordination is achieved by DoE participation as a non-voting member of the Joint NBC Defense Board, DOE participation in CB Defense Program science and technology reviews, and regular meetings with DoE and visits to national laboratories.

The Department of Defense's Chemical and Biological Defense Program and DARPA and the Department of Energy's Chemical and Biological Nonproliferation Program *have worked* together to provide a report to Congress on our cooperative work in chemical and biological defense science and technology, prepared through an interagency coordination mechanism known as the Counterproliferation Program Review Committee Focus Group, which involves DoD, DOE, and the Intelligence Community.

The Department of Defense also participates in the NSC-led Weapons of Mass Destruction Preparedness Group (WMDP), which coordinates activity in the U.S. government towards preventing, detecting, and responding to the release of terrorist release of weapons of mass destruction, and towards more effectively managing the health, environmental, and law enforcement consequences of such an incident should one ever occur. The WMDP does not directly address or oversee DOD Chemical and Biological Defense Program's mission of providing the warfighter with the capability to operate effectively in a chemical or biological contaminated environment. However, technology development efforts within the Department of Defense, including the Chemical and Biological Defense Program, that can contribute directly to the domestic preparedness mission are coordinated with other agency programs through the WMDP's R&D subgroup, chaired by the White House Office of Science and Technology Policy.

The DoD CB Defense Program is aware of the limited pharmaceutical and vaccine production capability available for both the military and civilian population in the United States. The CB Defense Program will collaborate with the National Pharmaceutical Stockpile Program (NPSP) located at the Center for Disease Control and Prevention within the Department of Health and Human Services to meet the needs of both the military and civilian populations. Additionally, the CB Defense Program will collaborate with the NPSP in the ongoing development of pharmaceuticals and vaccines to improve response capabilities to chemical and biological attacks.

The CB Defense Program also leverages industrial capabilities by briefing industry annually on program technology needs at an annual program briefing to industry. Further, the CB Defense Program reviews industry independent research and development efforts and encourages industry participation in joint field trials conducted annually at Dugway Proving Ground in Utah, which provides an independent validation and assessment of capabilities.

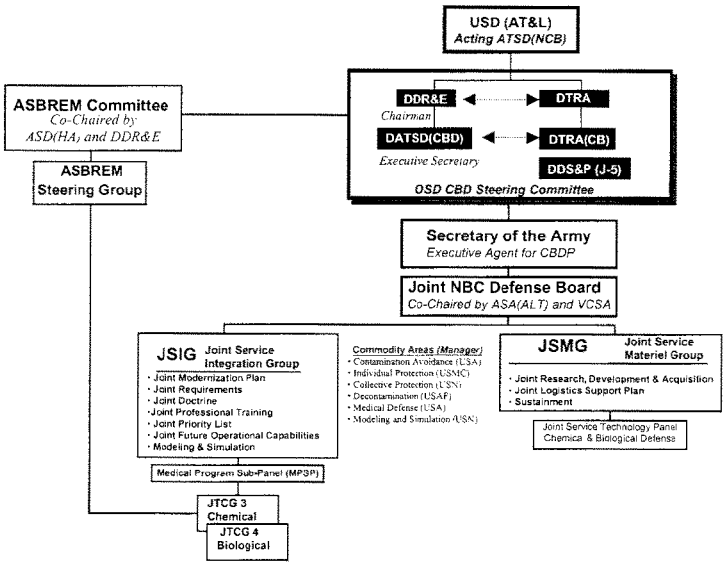
The CB Defense Program has numerous bilateral and multilateral international cooperative efforts. These include working groups with NATO, The Technical Cooperation Program, data exchange agreements, and others.

VII. Conclusion

Since Operation Desert Storm identified deficiencies were detailed in the *Conduct of the Persian Gulf War, Final Report to Congress* (Public Law 102-25), significant progress has been made within the CB defense readiness area. Improvements continue within the near term. The current developmental program is focusing on a jointly integrated, balanced approach to obtaining needed capabilities for joint forces within affordability constraints. Although progress has been made, serious challenges remain with both CB defense technology approaches, and with budget constraints. The Department is continually analyzing priorities and resources required to execute an effective program. The Chemical and Biological Defense Program, just as the myriad other important DoD programs, will continue to compete for scarce resources in a constrained budget environment. Emphasis on joint efforts that eliminate duplication of effort will result in achieving the most effective use of limited resources.

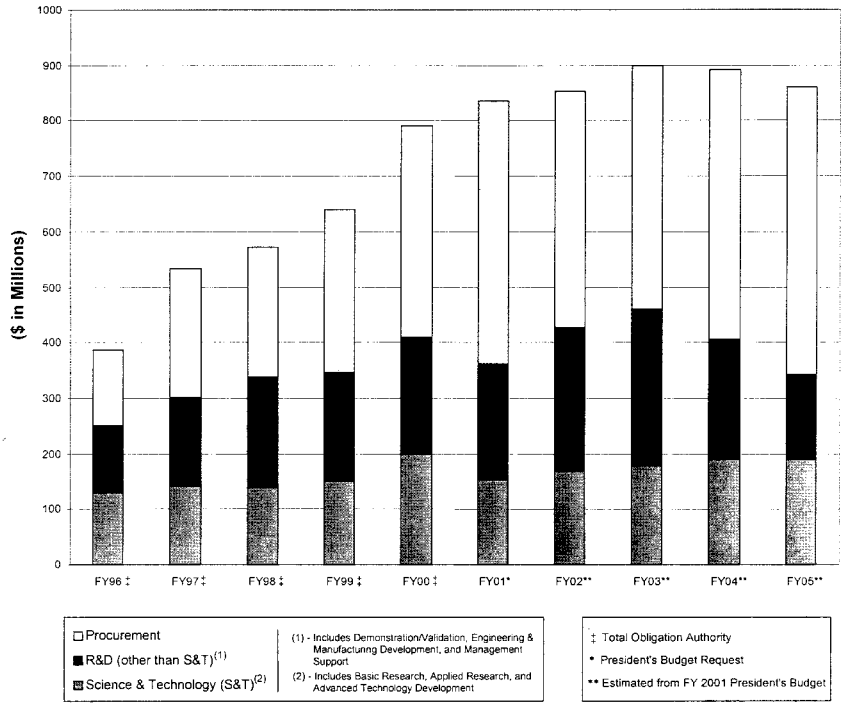
In summation, the DoD CB Defense Program responds to the threat – requirements - programs process. Programs are in place to respond to user needs and shortfalls. Oversight and management of the DoD CB defense program continues to improve and complies with Public Law 103-160. Significant progress has been made in implementation of management initiatives required. The Department is on the right azimuth 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.

Organization of the DoD Chemical and Biological Defense Program



ASA(ALT) - Assistant Secretary of the Army for Acquisition, Logistics, and Technology
ASBREM - Armed Service Biomedical Research Evaluation and Management
ASD(HA) - Assistant Secretary of Defense for Health Affairs
ATSD(NCB) - Assistant to the Secretary of Defense for Nuclear and Chemical and Biological Defense Programs
DATSD(CBD) - Deputy Assistant to the Secretary of Defense for Chemical and Biological Defense
DDR&E - Director, Defense Research and Engineering
DDS&P - Deputy Director, Strategy and Policy (J-5), Joint Staff
DTRA - Director, Defense Threat Reduction Agency
DTRA(CB) - Director, DTRA Chemical and Biological Defense Directorate
JTCG - Joint Technology Coordinating Group
USA - United States Army
USAF - United States Air Force
USD(AT&L) - Under Secretary of Defense for Acquisition, Technology & Logistics; serves as the chairman of the Defense Acquisition Board
USMC - United States Marines Corps
USN - United States Navy
VCSA - Vice Chief of Staff of the Army

DoD Chemical and Biological Defense Program
Source: FY01 President's Budget



Mr. SHAYS. Thank you very much.

We are going to have two votes, so we might as well go until we have to leave because then we have to wait for the next vote.

So we are probably going to interrupt you, Dr. Stoutland, but why don't you start?

Mr. STOUTLAND. I would like to thank the chairman and the members of the subcommittee for the opportunity to appear before you and describe our efforts to counter the use of weapons of mass destruction.

My name is Page Stoutland and I am the Director of the Department of Energy National Nuclear Security Administration's Chemical and Biological Nonproliferation Program. Today, I will concentrate on the important topic of equipment and operational requirements and coordination as they relate to chemical and biological research and development programs.

The Department's Chemical and Biological Nonproliferation Program [CBNP] as we refer to it, was initiated in response to the fiscal year 1997 Defense Against Weapons of Mass Destruction Act. The mission of the program is to develop, demonstrate and deliver systems and the supporting technologies that will lead to major improvements in the U.S. capability to prepare for and respond to chemical or biological attacks.

Technology plays a critical role in defending the U.S. population against attacks with chemical and biological weapons. These emerging threats, whether of domestic or foreign origin, are rooted in science and technology, and any effective response must draw on similar expertise.

Our program has three principal elements: analytical studies, technology development, and domestic demonstration application programs. Analytical studies are used to help guide the overall program direction, as well as individual technical areas. One overarching study was initiated last year to examine alternative system concepts for defending cities against chemical or biological attack. This was done jointly with the Defense Threat Reduction Agency.

Technology development is the core program element. The program targets not incremental improvements, but major capability enhancements that can be achieved in the 3 to 5-year timeframe. There are currently four areas of specific focus: detection, biological foundations, modeling, and decontamination.

The third program element consists of domestic demonstration application programs which bring together individual technologies into more capable systems in the 2 to 3-year timeframe. This integration is important, since it is usually only at the system level that problems are solved. The goal of these programs is to integrate current technology into prototype operational systems directed at specific applications.

I now turn to the issues central to this hearing: assessing the chemical and biological threats, defining non-medical R&D requirements, and more generally determining what we do within the CBNP.

In a general sense, our R&D investments are guided by a process that considers the threat and related vulnerabilities, and the benefit that a particular technology or system would have were it to be

developed. Within this context, we have undertaken a number of specific activities to identify the highest impact areas for R&D.

First, characterizing the threat environment is important for guiding our R&D activities. DOE does not conduct threat assessments in the chemical and biological areas. Instead, we rely on the FBI, the defense and intelligence communities, and public health assessments as appropriate.

These assessments which, for example, consider the agents most likely to be used, are then used to guide our R&D activities. Implicit in this process is the recognition of the uncertainties inherent in estimating the nature and magnitude of the threat, and that these uncertainties must be factored into our planning.

Threat assessments as well as other factors are necessary for the formulation of equipment and operational needs. These needs will ultimately be the result of a complex process that involves policymakers, technologists, first responders, the medical community, and others. As discussed in the GAO report, today there are no formal requirements for countering the domestic chemical and biological threat. This is not because we or others haven't considered the issue, but it is rather representative of the challenges implicit in arriving at a set of needs or requirements that would serve a diverse set of users and act as meaningful targets for R&D programs.

In this environment, one must consider new mechanisms to identify user needs and to guide R&D programs. Within the CBNP, we sponsor two sets of activities that, in our view, contribute to the overall U.S. chemical and biological defense strategy and identify the corresponding needs or requirements.

These activities buildupon our extensive interactions with potential technology users, and participation in the numerous processes designed to more clearly understand their needs. For example, we participate in the NSC-led Weapons of Mass Destruction Preparedness Group. Within this group exists an R&D subgroup chaired by the White House Office of Science and Technology.

We fully support these processes, but in our view more is required. Specifically, we use analytical studies to aid in the development of an overall U.S. strategy to counter the CB threat. Our Defense of Cities Study aims to develop an analytical framework by which we can compare the various chemical and biological defense options available to policymakers. This will help to identify at a high level which components—for example, technologies—would have the highest value in terms of a response system and where further R&D might be most valuable.

The most important component of our program for understanding user needs is our demonstration programs, or DDAPs as we call them. These programs, as I mentioned earlier, are designed to field and demonstrate complete prototype systems that use technology developed within the CBNP or elsewhere. In doing this, we work closely with users who host the demonstration and in an iterative way determine their needs.

It is important to emphasize here the important difference between a stated need for a particular piece of hardware and the requirement for a system with particular performance specifications.

Mr. SHAYS. Dr. Stoutland, I am going to let you summarize when we get back. I am very sorry, but we are going to go vote. I am

sorry that we have to wait for another vote, so if you want to get a Coke or something, you probably have 15 minutes to do it.

So we will stand adjourned.

[Recess.]

Mr. SHAYS. In 20 minutes, we are going to have another vote, so we will see how that unfolds.

Dr. Stoutland, please feel free to conclude.

Mr. STOUTLAND. OK, I will continue and summarize.

The most important component of our program, as I was saying, are our demonstration programs. These are designed to field and demonstrate complete prototype systems that use technology developed within our program or elsewhere. In doing so, we work closely with users who host a demonstration and in an iterative way understand their needs.

In order to provide you with some more insight into one of these programs, I would like to briefly describe one of our demonstration programs, PROTECT. With PROTECT, we are working closely with the Department of Transportation and a number of major U.S. subway systems to examine systematically and rigorously the vulnerability of subway systems to chemical or biological attack. Using computer models, we can estimate not only what the effects from an attack might be, but how to most effectively respond by, for example, changing the air flow in a subway system.

We are now aggressively moving forward both in testing chemical detectors and improving the computer models and information systems necessary to realize these goals. Next year, a demonstration of the complete system will take place involving one subway station, and the following year a network of five stations will be demonstrated. This demonstration will result in the transit authorities being able to assess in their subway the value of such a system, and provides important guidance to our R&D program about where further technology improvements are needed.

Finally, let me address the issue of coordination. The DOE program is designed to complement other U.S. Government programs, while relying on the unique capabilities of the DOE laboratories. We either participate directly or follow the status of a number of interagency coordination mechanisms.

In addition to these groups, we participate in a number of formal coordination mechanisms with the defense and intelligence communities, such as the Counterproliferation Program Review Committee. Within the last year, the Counterproliferation Program Review Committee has formed a chemical and biological defense focus group to specifically help coordination in the chemical and biological area. Informal coordination occurs routinely via information exchanges between our program and other agencies, and we sponsor an annual meeting typically attended by over 200 people to review the status of our program.

Let me conclude by saying that the DOE program if focused on addressing the high-leverage areas, particularly detection, that have been identified as being central to an effective response to chemical and biological attacks. Our program builds upon existing capabilities of the DOE laboratories and has begun to reach out to the industrial and academic communities.

The chemical and biological threat presents enormous challenges. We are committed to fully utilizing the capabilities of the DOE and its laboratories in order to meet these challenges. In carrying out this commitment, we will continue to work closely with others to understand the evolving threat, to better appreciate the needs of technology users, and to coordinate our program with those in other agencies.

Thank you. I would be happy to answer any questions you may have.

[The prepared statement of Mr. Stoutland follows:]

Statement of Dr. Page Stoutland
Director, Chemical and Biological Nonproliferation Program
Office of Defense Nuclear Nonproliferation
National Nuclear Security Administration (NNSA)
U.S. Department of Energy
before the
House Committee on Government Reform
Subcommittee on National Security, Veterans Affairs, and International Relations
March 22, 2000

Combating Terrorism: Coordination of Non-medical R&D Programs

Introduction

I'd like to thank the Chairman and Members of the Subcommittee for the opportunity to appear before you and describe our efforts to counter the use of weapons of mass destruction. My name is Page Stoutland and I am the Director of the Department of Energy National Nuclear Security Administration's Chemical and Biological Nonproliferation Program. This program is carried out within the Office of Defense Nuclear Nonproliferation, headed by Deputy Administrator Rose Gottemoeller. Today I will discuss the Department's efforts in countering chemical and biological threats to the U.S. population and will concentrate on the important topic of equipment and operational requirements as they relate to R&D programs. I will also describe briefly the coordination mechanisms between the DOE and related programs.

Chemical and Biological Nonproliferation Program (CBNP)

I'd like to first describe in general terms the Department's Chemical and Biological Nonproliferation Program (CBNP). This program was initiated in FY 1997 in response to the Defense Against Weapons of Mass Destruction Act ("Nunn-Lugar-Domenici"). The mission of the CBNP is to develop, demonstrate, and deliver systems and the supporting technologies that will lead to major improvements in the U.S. capability to prepare for and respond to chemical or biological attacks. The program builds upon existing DOE capabilities and is focused on developing detection and response systems to improve our domestic preparedness. In selected areas we also support the needs of the Defense and Intelligence Communities. Our FY 2000 budget is $40.0 million; a $21.5 million increase over the FY 1999 budget. Our request for FY 2001 is $42 million.

DOE's and the national laboratories' involvement in this area builds upon a long history of supporting nonproliferation and national security policy. As part of its primary nuclear science and technology mission, DOE has developed substantial capabilities in areas that are directly related to countering the chemical and biological threat. These capabilities, in areas such as genomic sequencing, development of new DNA-based diagnostics, and advanced modeling and simulation, and the linking of these capabilities with our expertise in nonproliferation and national security, form the basis for DOE's role in combating chemical and biological threats. In addition to DOE-supported efforts, our national laboratories conduct over $50 million per year in

chemical and biological defense R&D for other government agencies in direct support of their missions.

Technology plays a critical role in defending the U.S. population against attacks with chemical and biological weapons. These emerging threats, whether of domestic or foreign origin, are rooted in science and technology and any effective response must draw on similar expertise. Technology, however, is only one dimension of the complex system of people, organizations and policies, operational procedures, physical resources, and information flow that comprises a preparedness and response capability. In this context, it is important to recognize the complex issues associated with protecting civilians from chemical or biological attacks that are distinct from the issues the military faces on the battlefield. Technology must be developed with these factors in mind to effectively anticipate and meet operational needs.

Guided by the goal of advancing technology to counter the civilian chemical and biological threats, the CBNP has three principal elements: (1) Analytical Studies, (2) Technology Development, and (3) Domestic Demonstration and Application Programs (DDAPs). I will now briefly summarize each of these elements.

Analytical Studies

The CBNP uses analytical studies to help guide the overall program direction as well as individual technical areas. In general, these studies use analytical and simulation models to assess the value of technology in system applications. At the program level, such studies are useful in comparing impacts of the various technology development areas within the CBNP. They can also be directed at the more comprehensive response system that extends well beyond the scope of the CBNP technology development and demonstration programs. One overarching study was initiated last year to examine alternative system concepts for defending cities against chemical or biological attack.

Technology Development

Technology Development is the core R&D program element. In general, development is focused on technologies for which the basic science is already understood. The program targets, not incremental improvements, but major capability enhancements that can be achieved in the three to five year time frame. Our program currently has four areas of specific focus: detection, biological foundations, modeling and prediction, and decontamination. Our program does not support R&D in medical treatment or individual protection (suits, masks), since other agencies have comprehensive programs in these areas. Coordination in those areas in which several agencies are pursuing R&D is essential, and I will discuss coordination mechanisms later in my remarks.

Domestic Demonstration and Application Programs

The third program element consists of Domestic Demonstration and Application Programs (DDAPs) which bring together individual technologies into more capable systems in a two to three year timeframe. This integration is important since it is usually only at the system level that

problems are solved. The goal of the DDAPs is to integrate current technology into prototype operational systems directed at specific applications. The DDAPs also provide a vehicle for introducing emerging technology and limited capability systems into operational settings, giving system operators experience with the technology. With the same vehicle, technology developers gain a clearer sense of the performance requirements that the technology must meet. There are two DDAPs currently underway:

- PROTECT: Program for Response Options and Technology Enhancements for Chemical/Biological Terrorism.
- BASIS: Biological Aerosol Sentry and Information System.

Both of these programs focus on the demonstration of early detection, identification, and warning (DI&W) systems. I will return to these system application programs shortly.

Recent Highlights

I'd like to briefly summarize a few of the highlights that have occurred within the program over the last year.

A central part of the CBNP is the development of detection systems. Improved detection capabilities are critical— domestically, even small quantities of chemical or biological agents can have severe effects, and false alarms can not be tolerated. The DOE program is developing a suite of detection systems--today I will mention just two of them. The first, a chemical and biological toxin detector will be a hand-held unit able to rapidly detect many different toxic agents with a false alarm rate of less than 1 in 10,000 measurements. This detector is possible because of recent advances in micro-machining technologies and in the fabrication of miniature lasers and optical components—all of these capabilities are resident at our laboratories. This year we will demonstrate a hand-held prototype in the laboratory—in two years it will be demonstrated in a rugged field version.

We are building other detectors for the very different application of detecting biological pathogens such as anthrax. For example, this year one of our laboratories is building half a dozen hand-held biodetectors which will be given to first responders and others for "beta testing" in the field. If successful, we, in conjunction with commercial partners, will build many more.

Requirements

I now turn to the issues central to this hearing: assessing the chemical and biological threats, defining non-medical R&D requirements, and more generally, how we determine what we do within the CBNP. In a general sense, the CBNP R&D investments are guided by a process that considers the threat and the related vulnerabilities, and the benefit that a particular technology or system would have were it to be developed. Within this context, we have undertaken a number of specific activities to identify the highest impact areas for R&D that build upon threat characterization and recommendations regarding specific equipment requirements. I will now briefly describe the CBNP role with respect to threat assessments, equipment requirement

processes, and specific CBNP activities designed to aid in the identification of equipment and system needs.

Characterizing the threat environment is important for guiding our R&D activities. DOE does not conduct threat assessments in the chemical and biological areas. Instead, we rely on the FBI, the Defense and Intelligence Communities and public health assessments as appropriate. These assessments, which for example, consider the agents most likely to be used, are then used to guide our R&D activities. Implicit in this process is the recognition of the uncertainties inherent in estimating the nature and magnitude of the threat, and that these uncertainties must be factored into our planning.

Threat assessments as well as other factors are necessary for the formation of equipment and operational needs. These needs will ultimately be the result of a complex process that involves policy makers, technologists, first responders, the medical community, and others. As discussed in the General Accounting Office report, today there are no formal requirements for countering the domestic chemical and biological threat. This is not because we or others haven't considered the issue, but rather is representative of the challenges implicit in arriving at a set of needs or requirements that would serve a diverse set of users, and act as meaningful targets for R&D programs. Lists of needs must be translated into the highest priority areas for R&D if they are to usefully guide our research activities.

It is useful to contrast this situation with that of the military's requirements process. The military is a vertically integrated organization, with researchers directly supporting users all of whom ultimately report to the Secretary of Defense. The civilian situation is much more complex as there are many users in many different organizations with very different needs. In addition, the science and technology infrastructures and expertise often reside in organizations different from those with the operational responsibilities.

In this environment one must consider new mechanisms to identify user needs and to guide R&D programs. Within the CBNP, we sponsor two sets of activities that, in our view, contribute to the overall U.S. chemical and biological defense strategy, and identify the corresponding needs or requirements. These activities build upon our extensive interactions with potential technology users, and participation in the numerous processes designed to more clearly understand the needs. For example, we participate in the NSC-led Weapons of Mass Destruction Preparedness Group (WMDP) group. Within the WMDP exists an R&D subgroup chaired by the White House Office of Science and Technology Policy which coordinates R&D that addresses the domestic chemical and biological threat, and facilitates the identification of needs. We fully support these processes, but in our view more is required.

Specifically, our analytical studies program component directly contributes to the development of an overall U.S. strategy to counter the CB threat. Presently, within this program element we are conducting a high-level study we call the *Defense of Cities Study*. This study aims to develop an analytical framework by which to compare the various chemical and biological defense options available to policy makers. For example, the study seeks to be able to quantitatively compare the relative merits of various protection and response systems. This will help to identify, at a high level, which components (e.g., technologies) would have the highest value in

terms of a response system and consequently where further R&D might be most valuable. Phase I of this study is complete, and Phase II will be complete this fiscal year..

The most important component of the CBNP for understanding user needs is our demonstration programs, or DDAPs. These programs, as I mentioned earlier, are designed to field and demonstrate complete prototype systems that use technology developed within the CBNP or elsewhere. In doing this we work closely with users who host the demonstration, and in an iterative way determine their needs. It is important to emphasize here the important difference between a stated need for a particular piece of hardware, and the requirement for a system with particular performance specifications.

In order to provide you with more insight into one of these demonstration programs, I'd like to briefly describe one of our DDAPs: PROTECT. Within PROTECT we are working closely with the Department of Transportation and a number of major U.S. subway systems to examine systematically and rigorously the vulnerability of subway systems to chemical or biological attack. Using computer models we can estimate not only what the effects of an attack might be, but how to most effectively respond to them by, for example, changing the air flow in the subway system. Let me give you one example of the impact that such a system might have—our scientists have estimated that if one can respond within minutes with appropriate actions (using existing equipment) that over 1800 lives would be saved in a small-scale sarin nerve gas attack when compared to how we are able to respond today. The reduction in potential casualties could be 10 to 100 times greater in the case of a deadlier biological agent such as anthrax. In either case, mitigating actions depend critically upon prompt detection of the attack. We are now aggressively moving forward both in testing chemical detectors, and in improving the computer models and related information systems that are essential to enable the rapid decisions necessary to realize these goals. Next year a demonstration of a complete system will take place involving one subway station, and the following year a network of five stations will be demonstrated.

This demonstration will result in the transit authorities being able to assess, in their subway, the value of such a system. In addition, the demonstration provides important guidance to our R&D program about where further technology improvements are needed.

Coordination

Finally, let me address the issue of coordination. The CBNP is designed to complement other U.S. Government programs, while relying on the unique capabilities of the DOE laboratories. As part of the coordination process, we either participate directly or follow the status of the Technical Support Working Group (TSWG), the National Defense Preparedness Office (NDPO), and the Weapons of Mass Destruction Preparedness Group (WMDP) efforts. In addition to these groups we participate in a number of formal coordination mechanisms with the Defense and Intelligence Communities such as the Counterproliferation Program Review Committee (CPRC). Importantly, within the last year the CPRC has formed a Chemical and Biological Defense Focus Group to specifically help coordination in the chemical and biological area. A report describing DOE and DoD coordination will be submitted to Congress within the next few weeks.

Informal coordination occurs routinely via information exchanges between the CBNP and the DoD, HHS, DOJ, and other agencies. We also sponsor an annual meeting to review the status of the DOE program. This meeting attracts participants from across the chemical and biological counterterrorism community, and was attended by approximately 200 people last year—nearly 100 of these representing other agencies.

Conclusion

Let me conclude by saying that the Department's CBNP program is focused on addressing the high-leverage areas—particularly detection—that have been identified as being central to an effective response to chemical and biological attacks.

The benefits of these efforts are clear.

Detection and warning systems enable prompt responses that can limit exposures to lethal agents and provide timely information to the medical community, ultimately saving lives and dollars.

Our program builds upon existing capabilities of the DOE national laboratories, and has begun to reach out to the industrial and academic communities. The program emphasizes the near-term fielding of detection and warning systems to protect key events and facilities, while developing more robust capabilities for the longer term. The chemical and biological threat presents enormous challenges—we are committed to fully utilizing the capabilities of the DOE and its laboratories in order to meet these challenges. In carrying out this commitment we will continue to work closely with others to understand the evolving threat, to better appreciate the needs of technology users, and to coordinate our program with those in other agencies.

Thank you, and I'd be happy to answer any questions you may have.

Mr. SHAYS. Thank you very much, Dr. Stoutland.

Dr. Kerr.

Mr. KERR. Mr. Chairman, members of the committee, thank you for the opportunity to speak to you on behalf of the FBI.

I am Assistant Director in charge of the FBI Laboratory Division, and while we have the word "laboratory" in our name, we are a little different from what you might expect, in that while we do forensic examinations of evidence, we also provide a great deal of operational support, particularly in the counterterrorism area.

We work for the FBI field offices, of whom there are 56, so they are a principal customer, if you will. We work for other law enforcement agencies in providing training and equipment, which I will come to, particularly again in the counterterrorism area. And we work with those who manage our investigative programs in the FBI, of whom Bob Burnham, to my left, is one.

The kind of support that we provide and where our needs are made clear can be exemplified by what happened over the millennium weekend, where all eight of the sections of our division were involved, and some 1,100 people in those sections. Of our 43 units, 20 were directly involved, including those in electronic and physical surveillance, people doing chemistry, explosives examination and latent prints on Mr. Rassam's car and what came across the border in it. And we also deployed our explosives render safe teams here in the national capital area, the hazardous materials response capability, and our crisis communications people. So we are, if you will, a tactical technology organization.

Most recently, we have been operating in Irvine, CA, where the mayor had to declare an emergency because of a biological threat. But the biological threat was overlain by explosives and weapons. You may have read about that case where, in fact, the doctor who had all those materials was killed. We ran the crime scenes at the embassy bombings in Africa two summers ago, and of particular moment for this committee the Larry Wayne Harris case with the anthrax samples in Las Vegas was one that we had to respond to. So we learn by our casework.

The counterterrorism activities and the support today underlie the five rapid deployment teams that the FBI has stood up around the country. They are based on our largest field offices; two of them are here in Washington. And there is a technical component now to each of those teams, with the equipment to go with it. We also have the disaster squad responsibility that deals with aircraft crashes, investigations like TWA 800, more recently Egyptair and the Alaska Airlines crash.

The kinds of capabilities we offer more broadly are things like the EXPRESS data base, which is the explosive Reference search system, and that is funded by the Technical Support Working Group in conjunction with the FBI, and it is to provide data to all that might confront an explosive device in order to deal with it properly.

We operate the Hazardous Device School in Huntsville, AL. That is the school that trains all of the State and local bomb techs today across the country, as well as the FBI's own.

Mr. SHAYS. That is a very popular school, I might add.

Mr. KERR. Thank you.

Mr. SHAYS. I mean, there is a long waiting list, as I understand it.

Mr. KERR. Yes, sir, and we are hoping that, in fact, we are going to be able to increase the capacity of it in the next few years. That school now includes a module of training on weapons of mass destruction threats, and so all of the people going through that school or recertified by it are being exposed to the current generation of capability that there is.

In terms of R&D highlights, I should point out that we don't have the resources or the ambition to replicate what other agencies of the Government have in place. So through memoranda of understanding with the Department of Energy, with the Army Fort Dietrick people, with Edgewood Arsenal and others across the country, we have the opportunity to use their specialized facilities and people in many of our programs. So, for example, in the Larry Wayne Harris case we brought the suspected anthrax samples back here to Fort Dietrick for analysis because they have the containment facilities and the expertise to do that quickly.

SBCCOM at Edgewood has developed a fly away laboratory for us. It was deployed, for example, to the World Trade Organization meeting in Seattle. It will be here in Washington for the IMF meeting. But, in fact, it is a replica of the treaty lab that that command had developed for treaty monitoring purposes, with modifications to make it suitable for law enforcement.

The Department of Energy interaction, starting in 1998, has led to 10 projects at the national labs and a number of other more specialized tasks that we fund out of counterterrorism budget. In 1999, we took advantage of expertise at MIT's Lincoln Lab, which is a Department of Defense laboratory where they are developing a simplified DNA extraction capability for field use.

This current year, the large vehicle bomb disablement project is underway jointly with the Department of Defense and Department of Energy. The improvised explosive device data base is being put together this year, and the advanced render safe capabilities that we are doing jointly with the Department of Defense and DOE are well underway, including foreign participation from the United Kingdom.

We, in fact, should point out, in the statement I have given you for the record there is a table that displays some of the specific projects we work on. And for those who serve on the Armed Service Committee or others like them, I should point out that the letter after the number is "k," not "m." It is a way of making a point to you.

Law enforcement and the Justice Department have not had a history of sustained R&D programs. We have tended, to support our casework, to buy off the shelf when we can to support current needs. So these relationships with the Department of Defense and the Department of Energy are particularly valuable to us because they are, in fact, in a mode of sustaining R&D programs over a number of years. They have stability in their technical staffing to provide it, and they don't have to go out and do casework everyday as we do, which takes people away from the R&D projects.

To further support our relationships with the other agencies, one of my Deputies is presently seconded to the Defense Threat Reduc-

tion Agency and heads the Advanced System Concepts Office there, providing us real glue in terms of joint planning and thinking about some of the BW and CW problems.

One of my unit chiefs is stationed at the Lawrence Livermore National Laboratory to tie very closely into the work they do in dealing with weapons of mass destruction detection, planning, and other things that Dr. Stoutland briefed you on. We have four or five people exchanged with counterparts in the intelligence community, not for liaison, but, in fact, to fill real responsible operating jobs. It is a way of cross-pollinating the tools and techniques that we have.

Last, we think while the funding for it is small, the Technical Support Working Group plays a very significant role in bringing the agencies to the table to talk about their joint requirements. It is led, of course, at the executive level by State, Defense, Energy, and now the FBI. But it reaches across the entire law enforcement and national security communities, and it has been an excellent place to fund projects that deal, for example, with explosives detection, some of the biological detection programs. And I think it is a good model for Government cooperation.

We are going to continue to expand these relationships with the other agencies, but the most important thing is that we exercise them almost every month. One of the ways we have had to exercise them is that anthrax threat letters have become, of course, a favorite thing for some people. They come to the Congress, they come to the hospitals, they are everywhere around the country.

We couldn't put people in the position of saying we are going to fly out and pick it up and in 48 hours we will tell you whether you were exposed to a pathogen. That is not satisfactory for the public that we protect. So with the help of the Centers for Disease Control and the public health laboratories across the country, there is now a network in place.

So if we get a call from Cincinnati about a threat letter, we can advise them, first of all, how to package it successfully for their own safety and those around them, and who to take it to so that they can get an answer in a few hours rather than wait for the time it takes to transport it back here to Washington and analyze it. So it is a notable success. I think it is the kind of thing that clearly we benefit from, and hence want to encourage. Congressional interest helps a great deal in that area as well.

Last, with respect to the State and local first responders, I mentioned the HDS school. We also in the past year have been buying and equipping State and local responders with sort of first-level capability, and that has, I think, been a good program. It has not put the most sophisticated equipment in their hands, and there is a reason for that.

One of the things that we have to do is not take the best laboratory equipment to the field; we have to worry about shelf life, maintenance, calibration. We don't want to inflict an added overhead burden on the first responders if we can design around it.

Mr. Chairman, I will be happy to answer your questions.

[The prepared statement of Mr. Kerr follows:]

Statement of
Dr. Donald M. Kerr
Assistant Director, FBI Laboratory Division
Federal Bureau of Investigation
before the Subcommittee on National Security
March 22, 2000

Mr. Chairman, members of the Committee; thank you for the opportunity to appear and discuss with you the counterterrorism research and development activities of the FBI Laboratory Division.

The FBI Laboratory Division's mission is to provide forensic services to the FBI and other law enforcement agencies; deploy effective collection, surveillance, and tactical communications systems to support investigative and intelligence priorities; and to provide technical and scientific assistance through operations support, research, training, technology transfer and access to databases. To accomplish these goals, the FBI Laboratory Division has established five strategic objectives that support FBI national priorities: (1) focus on effective delivery of scientific and engineering support to investigative programs; (2) respond to major cases, terrorist events, and transportation disasters; (3) provide timely, high quality performance from evidence and information collection to courtroom testimony; (4) develop and disseminate new capabilities to support investigations and resolve crimes; and (5) enhance technical partnerships to support FBI mission both domestically and abroad.

The Hazardous Materials Response Unit (HMRU) within the FBI Laboratory, provides the capability to safely and effectively respond to criminal acts involving the possession, use, or attempted use of hazardous chemical, biological or radiological materials. This is accomplished through an integrated effort involving specialized response teams, a national training program, interagency liaison, technical assistance to FBI field and Headquarters divisions, and the development of field response programs. The HMRU also manages and conducts mission-driven research and development (R&D) targeted to enhance the capability to provide these services.

In addition, the FBI Laboratory is also tasked with responding to bombing matters both within the United States and overseas. The majority of the FBI's forensic examinations associated with bombing incidents are coordinated through the Explosives Unit (EU) of the FBI Laboratory. The EU is staffed by a team of qualified examiners who are trained in processing post blast bombing incidents and the analysis of commercial and improvised explosive and incendiary devices that may be associated with these events. Many of these examinations involve the identification and intended function of the components used in the construction of such devices, which include: detonators, wires, electronic components, initiators, tapes, timing mechanisms, containers, and power sources. The EU also has the capability to chemically analyze suspected explosives and accelerants as well as the residues that are formed after an event has occurred. In order to maintain the FBI's technical capability in this field, it is continuing with its efforts to conduct research into unique explosive related problems. Ultimately, these efforts will enable examiners to be better equipped in providing sound, scientifically proven, expert opinions to contributors.

The Explosives Unit is also one of many components of the FBI Laboratory Division that provide direct field support in bombing matters, bombing crime scene investigations, as well as searches of bomb factories and safe houses in which bombs or bomb components may be encountered. The FBI Laboratory Division has made significant efforts to staff and equip five Rapid Deployment Teams (RDT) capable of responding on short notice to major crime scenes around the world. The RDT is a coordinated effort with experts from the FBI Laboratory Division along with predeployed equipment and Evidence Response Team personnel from major FBI field offices. The Rapid Deployment Teams originated following the August, 1998 embassy bombings in both Kenya and Tanzania. The Rapid Deployment Teams also deploy a variety of fly away chemical analysis instruments to crime scenes and search locations as needed. For example, both Thermedics EGIS and Baringer Ionscan explosive detectors have been deployed to incidents requiring onsite testing. Other specialized equipment such as the Raman Spectrometer is capable of interrogating hazardous materials in closed containers. This capability greatly enhances the FBI Laboratory Division's ability to collect, preserve and screen potential chemical evidence collected at major domestic and international terrorist events.

The Explosives Unit of the FBI Laboratory is also responsible for conducting liaison with domestic and foreign manufacturers of explosives as well as maintaining the Explosives Reference File (ERF) and the Explosives Reference Search System (EXPRESS) data base. Both of these systems are used to support forensic examinations. The EXPRESS database system was originally developed with joint funding by the FBI and the Technical Support Working Group (TSWG). The system is the largest single computer reference library in the world for identification and comparison of explosives and explosive components.

In addition to these FBI Laboratory Division components, the Bomb Data Center (BDC) serves as a resource center for the public safety bomb technician community. The programs managed in the BDC include: Technical Intelligence/Information; Field Training; the Hazardous Devices School; Operational Support; and Research and Development. The Research and Development program attempts to identify, develop, and deploy new tools and technologies to increase the safety and effectiveness of improvised explosive device detection, diagnostics, and neutralization operations.

Initiation of R&D Program during FY 97.

During 1997 the FBI Laboratory Division identified a requirement for a field-deployable laboratory capable of providing analyses of hazardous materials on location anywhere within the United States and possibly in certain foreign countries. To develop this "Fly-Away Laboratory," the FBI funded and managed a project with the U.S. Army Solider Biological Chemical Command (SBCCOM). This project was conducted with the cooperation and assistance of the Technical Support Working Group, Office of Special Technology (TSWG/OST), Department of Defense. The Fly-Away Laboratory is operational as of this date. The Fly-Away Laboratory provides a full range of standard chemistry and microbiology instrumentation and sample processing capabilities, as well as the capability to screen samples for radioactivity. The FBI also initiated a project at Pacific Northwest National Laboratory to investigate a new method for rapid screening of samples for pathogenic microbes. This project produced promising results, and has been extended through the end of FY 00.

R&D initiatives during FY 98.

During FY 98 the FBI Laboratory Division conducted an review of R&D requirements. This review resulted in the identification of the following main requirement categories:

1. Analysis of Hazardous Chemical and Biological Materials in Support of Criminal Investigations.

2. Examination of Contaminated Evidential Items.

3. Identification of Unknown Materials in Closed Containers.

4. Processing Samples for Chemical Analysis.

5. Processing Samples for Biological and Biochemical Analysis.

To expedite research in these areas, the FBI established an Interagency Agreement with the Department of Energy (DOE) based on the existing Memorandum of Understanding for Science and Technology between the DOE and the FBI. As a result, 10 new projects were initiated during FY 98:

- Development of a Compact DNA Fragment Analysis Flow Cytometer and Associated Sample Preparation Protocols for Bacterial Identification (Los Alamos National Laboratory)

- Nucleic Acid-Based Detection and Identification of Bacterial and Fungal Plant Pathogens, Crop Plants, and Turf Grasses (Pacific Northwest National Laboratory)

- The use of the Affymetrix™ DNA Chip for Forensic Analysis of Biological Samples (Lawrence Livermore National Laboratory)

- Field-Portable Fiber Optic Raman Spectrometer for Detection and Analysis of Hazardous Materials in Closed Containers (Pacific Northwest National Laboratory)

- Development of Compact Raman Instrumentation and Methods (Oak Ridge National Laboratory)

- Rapid Sample Preparation of Hazardous Materials Using a Field-Portable Supercritical Fluid Extractor (Pacific Northwest National Laboratory)

- Development of Methods for Extracting DNA from Bacterial Spores (Lawrence Berkeley National Laboratory)

- Biological Sampling Process Analysis Plan for the FBI Laboratory (Los Alamos National Laboratory)

- Field-Portable, Pre-PCR DNA Quantitation of Soil and Sediment Samples (Los Alamos National Laboratory)

- Development of a Network and CD ROM Based Course on Hazardous Materials for Law Enforcement Personnel (Oak Ridge National Laboratory)

Several of these projects are now nearing completion and have produced valuable products for the FBI Laboratory. Among these are a Portable DNA Quantifier for processing microbial DNA from complex samples, a Raman spectral data base of 177 selected hazardous compounds including chemical warfare agents and toxins, and a sensor for water-borne biological compounds. Other anticipated products of this joint effort with DOE include a portable supercritical fluid extractor for extracting hazardous chemicals from complex samples, DNA assays for selected high-priority crop pathogens, a portable Raman spectrometer for in-place non-invasive identification of hazardous chemicals inside transparent containers, and a web-based course on law-enforcement and hazardous materials for emergency responders. The latter development effort is slated for completion during FY-00 and will offer a network-based interactive training course on law enforcement operations involving hazardous materials; including biological and chemical agents and radiological materials.

In addition, the FBI Laboratory's Forensic Science Research Unit (FSRU) is currently conducting testing to evaluate and validate the performance of various portable instruments for detecting and identifying hazardous chemicals. In FY 1998, the Department of Justice Counterterrorism (CT) Fund earmarked $5,300,000 for the FBI Laboratory to perform explosives detection and CT research. The FBI Laboratory released a Broad Agency Announcement for Counterterrorism R&D based on these initiatives. The Laboratory received approximately 600 responses, including over 220 from the national laboratories. This funding resulted in the formation of a number of CT technology development research projects (18 projects with the Department of Energy under a MOU signed in May 1998, and projects with industry and academia). In addition to the external projects, FSRU scientists also conduct in-house research focused on the development new techniques of forensic analysis for both counterterrorism and violent crime. These technical experts are actively involved and are invaluable in the testing and validation of the deliverables of the CT technology development effort.

These CT R&D projects were generated through a strategic assessment of the FBI Laboratory's and state and local law enforcement's needs. This resulted in the formation of five critical technology initiatives for targeted CT research and development:

A. Explosives Detection Technology: The FY 98 Budget mandated that the FBI Laboratory pursue field portable explosives detection technology. The new technology will identify traces of explosive residue on suspect items during threat assessment, investigations, or in the examination of suspected packages. The technology can also be used to screen post-blast evidentiary items.

B. Forensic Evidence Analysis and Crime Scene Technology: The collection, preservation and

timely analysis of forensic evidence is critical in terrorism investigations. This initiative will develop new, improved, and validated analytical methods for the forensic comparison of evidentiary materials recovered from explosive devices (pre and post-blast) such as plastic, paint, metal, wires, tapes, explosives, and physiological fluids. These results can be compared with similar items recovered from suspects or to produce investigative leads. New technologies are needed for the laboratory confirmation of trace explosives residue on evidentiary items. Field portable crime scene robots and 3-D vision will be used for the collection and preservation of physical evidence at hazardous crime scenes.

C. Information Infrastructure Technology: There is the need to develop and evaluate secure technologies capable of improving the FBI laboratory's information infrastructure to deal with the massive amounts of forensic evidentiary material recovered during terrorist investigations or crime scene searches. The Laboratory also has the need to develop automated reference collections for common components used improvised explosive or hazardous devices. The need also exists to development methods of institutional knowledge capture and preservation.

D. Specialized and Examiner Training: FBI examiners need training in the newly developed forensic methods and in the nature of chemical, biological, and nuclear hazards that may be encountered as evidence or in crime scene searches though interactive CD-ROM and Internet/Intranet training modules. These training modules can be shared with other law enforcement agencies and first responders.

E. Victim and Terrorist Identification: Victim and/or suspect identification plays a vital role in crisis and consequence management. Fingerprint and DNA technologies also play an important role in other crimes as well. This research will improve latent fingerprint visualization technologies to aid in the identification of victim or terrorist suspects. The research may extend to the determination of survivability of latent fingerprints on pipe bombs. The development of automated methods for the preparation of forensic DNA samples will speed the identification of victims or suspects. It may be possible to recover mtDNA from latent fingerprints.

Counterterrorism R&D Projects

Project Title	Cost
I. Explosives Detection Technology	
▪ *Man Portable Air Defense Forensic System (MANPADS)*	$365K
▪ *Handheld Explosives Detector*	$127K
▪ *Standoff Explosives Detection by Microwaves*	$176K
▪ *Explosive Damage to Metals*	$150K
II. Forensic Evidence and Crime Scene Technology	
▪ *3-D Imaging and Ranging*	DOE$

■ *Serial Number Restoration*	$150K
■ *Elemental Profiling of Metals as Evidence*	DOE$
■ *Statistical Treatment of Class Evidence*	$150K
■ *Enhanced Trace Fiber Evidence Discrimination*	$250K
■ *Small Robotic Vehicle*	$150K
■ *Raman Spectroscopy for Trace Evidence*	$250K
■ *Solid Phase Microextraction*	$75K
■ *Trace Botanical Identification*	$220K
■ *Degradation of Drugs in Embalmed Tissue*	$322K
■ *Automation of mtDNA*	$195K
■ *Crime Scene Reconstruction*	$360K
■ *Active Thermography for S/N Restoration*	$384K
III. Information Infrastructure	
■ *Institutional Knowledge Preservation*	$150K
■ *Rapid DNA Profile Identification*	$282K
■ *SEM X-Ray Spectral Database*	$123K
■ *Raman Spectral Database*	$150K
IV. Specialized and Examiner Training	
■ *First Responder Web-Based Training*	HMRU
■ *Development of Crime Scene Distance Learning*	$105K
V. Victim and Terrorist Identification	
■ *Fluorescent Superglue (Phase II)*	$DOE
■ *mtDNA Sequencing Database (Phase I)*	$542K
■ *Facial Reconstruction*	$465K
■ *Latent Fingerprints in Blood*	$150K

Completed Counterterrorism Research Projects

1) *Solid Phase Microextraction Field Test Kit*
   - ✓ Field test kit of selected SPME fibers for accelerants, explosives, hazardous materials sampling.
2) *Degradation of Drugs in Embalmed Tissue (Phase 1)*
   - ✓ Developed methods to detect drug reactions with formaldehyde in exhumed remains.
3) *Databases of mtDNA sequences (Phase 1)*
   - ✓ 2000 of 5000 mtDNA sequences delivered.
4) *MANPADS - Man Portable Air Defense Systems*
   - ✓ Interactive CD-ROM provides a compendium of information related to the investigation of Manpads attacks on aircraft.
5) *Handheld Explosives Detector*
   - ✓ Modified handheld OIMS explosives detector for evidence screening, tactical operations, HQ Security.
6) *Explosives Damage to Metals*
   - ✓ Proof of principle investigation of Orientation Imaging Microscopy for metals deformations caused by explosives forces.
7) *Standoff Detection of Explosives by Microwaves*
   - ✓ Proof of principle demonstrated new standoff explosives detection technology.
8) *Serial Number Restoration*
   - ✓ Proof of principle for S/N restoration using Surface Acoustic Microscopy.
9) *Small Robotic Vehicle*
   - ✓ Small robotic vehicle for delivery of sensors, imagery, and data from hazardous crime scenes.
10) *SEM X-Ray Spectral Database*
    - ✓ Database for the collection, archiving and comparison of digital SEM photographs and X-Ray data.
11) *Raman Spectral Database*
    - ✓ Database of 250 common explosives, drugs, and WMD precursors.
12) *Development of Distance Learning Modules*
    - ✓ Internet and CD-ROM based Crime Scene Management Training.
13) *Latent Fingerprints in Blood*
    - ✓ New reagents and procedures to develop latent fingerprints in blood on dark objects.
14) *Database of mtDNA Sequences (Phase 1)*
    - ✓ 2000 mtDNA sequences have been added to the FBI database.

R&D initiatives during FY 99

During FY 99 a research project was initiated at MIT Lincoln Laboratory to develop a simplified method for extracting the DNA of microbes from field samples. The projected product of this effort is a simple self-contained cartridge for extracting the DNA. A new project at the SBCCOM was jointly sponsored by the FBI and TSWG/OST to develop analytical protocols for the Fly-Away Laboratory. The HMRU also initiated a complementary project at SBCCOM to develop and maintain the operational capability of the Fly-Away Laboratory. A postdoctoral program was initiated with Oak Ridge National Laboratory (ORNL) to place a qualified scientist within the FBI Laboratory's HMRU Biology Program. Funding was provided to the U.S. Army Medical Institute of Infectious Diseases (USAMRIID) and the Naval Medical Research Command (NMRC) to provide research and development services to the FBI Laboratory. Funding was provided to support a DOE employee working within the FBI Laboratory to develop the HMRU's Radiology Program.

R&D initiatives during FY 00

In FY 00 an agreement was established with DOE's Savannah River Technology Center (SRTC) to develop forensic radiology capability for the FBI Laboratory. An effort is currently underway to obtain an agreement with the U.S. Army Dugway Proving Ground (DPG) to develop containment and forensic analytical facilities for the FBI at that location. A second postdoctoral biological scientist has been placed in the FBI Laboratory with the assistance of ORNL. The FBI Laboratory has also increased its liaison with the Central Intelligence Agency to improve R&D coordination.

The FBI Laboratory, through the Bomb Data Center (BDC), participates in both the Explosive Detection and Disposal (ED&D) and the Chemical, Biological, Radiological, Nuclear (CBRN) subgroups of the Technical Support Working Group. In both of these forums the BDC serves as an advocate for state and local bomb squads, as well as technologies more appropriate for adoption by the FBI, usually due to classification or high unit cost considerations.

In the ED&D subgroup the BDC is the task manager for the following ongoing projects:

- Improvised Explosive Device (IED) Interactive Database: development of a software package consisting of information modules accessed through an interactive operating architecture which will help a bomb technician manage and successfully resolve an major or complex IED incident such as a truck bomb scenario.

- Large Vehicle Bomb Disablement Project: finalizing the testing and fielding of a specially designed and constructed explosively driven water disruption system used to defeat a large truck bomb.

- Low Cost Remote Firing Device: development and testing of a low cost transmitter and receiver set which will remotely initiate electrical and shock tube detonator tools. Useful for both training and operational deployment of specialized IED disposal/disablement tools.

- Characterization of Selected Explosive Disablement Charges: formal testing and characterization of COTS explosive disablement tools for use by state and local bomb squads against a wide range of threats, including vehicle borne IEDs and truck bombs.

- Testing of the Med-Eng, Inc. SRS-5 Search Suit used as ballistic protection against a explosively dispersed chemical/biological agent.

The FBI Laboratory Division also has an ongoing relationship with the National Institute of Justice which is funding several R&D projects directly supporting the bomb technician community. Specifically these projects are:

- Flying Plate Disrupter: adaption of high speed explosively driven flyer plates to disrupt large volume, high mass IEDs, e.g., a fifty-five gallon metal drum filled with four hundred pounds of ammonium nitrate/fuel oil explosive.

- Low Cost Robotics: identify and develop a low cost robotic platform for use by public safety bomb squads to more safely defuse IEDs.

- Real Time Radiography Demonstration Project: distribution and evaluation of the new Real Time Radiographic systems manufactured by SAIC and Fox X-Ray by selected state and local bomb squads.

Finally, under the Advanced Render Safe Team program, the FBI Laboratory Division has an ongoing effort with the DOE National Laboratories aimed at developing new tools and technologies to defeat sophisticated IEDs to include those with a chemical or biological payload. This program underway since FY98 has brought additional training and technical capabilities to the FBI Laboratory which will act to support requesting FBI Field Divisions and state/local responders in the event of a major incident.

Coordination of R&D with other Agencies:

As may be seen from the above, representatives of the FBI Laboratory have developed extensive research and development liaisons within the Federal government. Several other liaison efforts have also occurred.

In response to the increasing need for preparedness for the use of biological threat agents in acts of terrorism, a National Laboratory Response Network (LRN) for Bioterrorism has been established. The LRN is the result of an ongoing collaboration between the Centers for Disease Control and Prevention (CDC), the Association of Public Health Laboratories (APHL), the FBI Laboratory's Hazardous Materials Response Unit (HMRU), and other key federal agency partners. The mission of the LRN is to provide a rapid analysis to determine whether biological threat agents are present in clinical specimens and non-clinical evidentiary or environmental samples.

The LRN is comprised of federal, state, and local public health and veterinary laboratories. These laboratories have in place a full-time scientific staff and necessary containment facilities to isolate and identify biological threat agents. Through a cooperative agreement with the APHL, the CDC has distributed $41 million to 64 state and local public health laboratories in 41 states to provide resources in support of the LRN. These funds will be used to purchase laboratory equipment and reagents necessary for the identification of biological threat agents in clinical and non-clinical samples. Furthermore, the LRN provides standard operating procedures on a restricted-access Internet site which is maintained by the APHL, and supported by the CDC and the FBI's HMRU. The standard operating procedures and necessary reagents (which are ordered through the Internet site) will be used by all public health laboratories for the isolation and identification of biological threat agents in order to provide a uniform testing system. Regardless as to whether specific state public health laboratories received funding in FY99 from CDC, all state laboratories can gain access to the standard operating procedures and reagents by registering with the APHL.

In support of the mission of the FBI, the LRN will provide biological analysis of evidentiary samples collected by law enforcement officials. This will reduce the amount of time required for analysis by eliminating overnight transportation to specialty laboratories. This also will expedite any required treatment and/or decontamination of victims of bioterrorism, and reduce the anxiety of victims of hoax threats.

In addition, to assure direct access to specialized laboratory facilities capable of analyzing Chemical, Biological and Radiological materials the FBI Laboratory has established Memoranda of Understanding with appropriate laboratories within the Departments of Defense and Energy. Also, at the FBI Laboratory's request, the DOE funded a project at DOE's Ames Laboratory to develop a nationwide data base of veterinary resources, and the FBI Laboratory has monitored this project since 1998. Recently the Office of Justice Programs, Department of Justice (OJP/DOJ) initiated a similar effort at Louisiana State University (LSU), and the FBI Laboratory has participated in efforts to coordinate these two projects. As a spin-off of the Ames project, the FBI Laboratory developed a growing liaison with the U.S. Department of Agriculture (USDA). During February 2000, the FBI Laboratory co-sponsored a joint FBI/USDA/HHS national conference to review emerging technology for the detection of pathogens. Over 20 different research and development organizations participated in the conference, displaying both field and laboratory instruments already developed and in use as well as instruments and collection devices soon to be operational. Approximately 175 governmental personnel representing several agencies attended the all day conference. Presenters included DoD organizations (e.g. the US Army Soldier's Biological & Chemical Command, the US Army Medical Research Institute for Infectious Diseases, the US Army Natick Soldier Center, the US Air Force Battle Laboratory, the US Naval Medical Research Center, and the US Naval Research Laboratory), several DOE facilities (e.g. Lawrence Livermore NL, Los Alamos NL, Oak Ridge NL, Sandia NL, and Pacific Northwest NL) as well as several contractors (e.g. Battelle Memorial Institute, Diagra, ITT Industries, MesoSystems Technology INC., Perkin-Elmer, SAIC, and Tetracore) and academia (e.g. Auburn University, John Hopkins University-APL, Massachusetts Institute of Technology – Lincoln Laboratory, Northern Arizona State, the University of Maine, and the University of Maryland). The results of this unclassified conference will be used to direct future research efforts.

The FBI is an executive member of the TSWG and FBI Laboratory personnel routinely serve as co-chairs of TSWG subgroups. FBI personnel have served as co-chairs of TSWG's Chemical Biological Radiological Nuclear Subgroup (CBRN) since 1997 and have managed three TSWG-funded projects. Association with the TSWG helps the FBI Laboratory maintain an awareness of interagency research interests.

Additional R&D Coordination Efforts:

To further enhance it's research efforts and improve interagency coordination the FBI Laboratory Division has temporarily assigned a Deputy Assistant Director to act as the Director of The Defense Threat Reduction Agency's (DTRA) Advanced Systems Concept Office. The FBI Laboratory has also temporarily assigned a mid-level manager to DOE's Lawrence Livermore National Laboratory to act as an interface with Lawrence Livermore, Sandia, Los Alamos and Pacific Northwest National Laboratories. This individual will identify current research efforts at these laboratories that are useful to the FBI and coordinate these with the research requirements established by the FBI Laboratory.

Mr. SHAYS. Thank you very much.

Mr. Burnham, my understanding is you are going to be coming up to Connecticut.

Mr. BURNHAM. Sir, I will be coming up on Friday for the tabletop, as well as on Monday for the hearing.

Mr. SHAYS. It will be great to have you there. Why don't you give us your testimony and we will try to get your testimony done before I go and vote.

Mr. BURNHAM. OK, I think we can get it done, Mr. Chairman.

Again, Mr. Chairman and members of the committee, it is a pleasure to be here. I will be brief because, in the first place, I am a last-minute replacement here. Mr. Watson, my boss, the Assistant Director of the Counterterrorism Division, was unable to make it. His written statement has been submitted.

[The prepared statement of Mr. Watson follows:]

Statement of
Mr. Dale Watson
Assistant Director, FBI Counterterrorism Division
Federal Bureau of Investigation
before the Subcommittee on National Security
March 22, 2000

Chairman Shays, and Members of the National Security Subcommittee, thank you for the opportunity to discuss threat assessments and how they may influence the requirements for the development and acquisition of equipment and training for emergency response personnel reacting to a weapons of mass destruction (WMD) terrorist event.

In June 1995, President Clinton signed Presidential Decision Directive-39 (PDD-39) which reaffirmed the Federal Bureau of Investigation's (FBI) lead law enforcement and crisis management role in the U.S. Government's response to domestic terrorism. In May 1998, the President signed PDD-62 which charged the United States Department of Justice (DOJ), acting through the FBI, as lead agency for the Federal operational response to a WMD incident. Pursuant to both of these directives, the FBI is continuing to increase its involvement with state, local and Federal agencies who have both a crisis and consequence role in responding to a WMD threat or incident. The ability of our communities to respond will be critical to protecting lives and

property and ensuring public safety. Assisting states and localities to better protect themselves from such incidents, particularly incidents involving WMD, is a priority of the Department of Justice and the Attorney General.

Title 14, Section 1404, of the *Strom Thurmond National Defense Authorization Act for Fiscal Year 1999*, referred to as the "Defense Against Weapons of Mass Destruction Act of 1998," required that the Attorney General, in consultation with the FBI Director and representatives of appropriate Federal, State, and local agencies, develop and test methodologies for assessing the threat and risk of terrorist employment of WMD against cities and other local areas. The legislation further required that the development of this methodology include input from cities and local areas selected by the Attorney General, acting in consultation with the Director of the FBI and appropriate representatives of Federal, State and local agencies.

During legislative discussions concerning this enactment, the conferees expressed that, "the efforts of the Federal government to enhance domestic preparedness to respond to an incident involving weapons of mass destruction are hampered by incomplete interagency coordination and by the overlapping jurisdictions and missions of the various Federal departments and

agencies." As a consequence, the conferees recognized that state and local emergency response agencies are often presented with different and/or competing requirements and program priorities from the responsible Federal agencies.

Pursuant to this mandate, the FBI, in cooperation with the National Domestic Preparedness Office (NDPO) and the California Office of Emergency Services, set out to develop a threat and risk methodology which could be utilized by a jurisdiction to determine training and equipment needs. This assessment methodology was distinct in purpose and design from existing assessment methodologies commonly utilized by the FBI.

The FBI has since joined forces with DOJ's Office of Justice Program's (OJP) Office of State and Local Domestic Preparedness Support (OSLDPS), by integrating the FBI jurisdictional threat assessment methodology into a larger needs assessment tool. Specifically, the threat assessment developed by the FBI will be utilized by OJP and the states in implementing the *FY' 99 State Domestic Preparedness Equipment Support Program.* This program is designed to provide funding assistance to the nation's fifty states. Under this funding initiative, states are required to award sub-grants to local jurisdictions based on the results of this needs assessment. These assessments will be used by the

state to develop a statewide strategy for the purchase and/or acquisition of domestic preparedness equipment, training, exercise and technical support programs. These programs will assist the state in targeting available resources or activities having the greatest positive impact on levels of WMD terrorism response preparedness.

This needs assessment model was refined with the assistance of emergency management representatives from the states of California, Maine, Florida, and Oregon. Thereafter, the assessment methodology was piloted at the jurisdictional level, in Baton Rouge, Louisiana, and Cedar Rapids, Iowa, prior to finalization.

In September 1999, OJP initiated the *FY' 99 State Domestic Preparedness Equipment Support Program*. The *State Assessment and Strategy Tool Kit* will be delivered to all fifty states during upcoming OJP Domestic Preparedness Workshops scheduled to begin March 28, 2000. The FBI will participate in these workshops and has offered its assistance in the conduct of the assessments at the jurisdictional and State levels.

This assessment is the first step in gathering data that may be used at the National level to better identify equipment and

training needs across the United States. The assessment will also enable a pairing of this data against the relative risks identified in each geographical region.

What this assessment methodology is unable to answer is what additional resources must be available to effectively respond to the unconventional threat of a WMD, especially incidents involving biological and chemical agents. The FBI recently supported the General Accounting Office's (GAO) recommendation that the FBI prepare a formal, authoritative intelligence threat assessment that specifically assesses the chemical and biological agents that are most likely to be used by terrorists--non-state actors working outside a state-run laboratory infrastructure. Instead of placing the main focus on the "capabilities" and "intentions" of groups and/or individuals deemed to be a potential domestic terrorist threat, the FBI would focus on the particular chemical/biological WMD that is likely to be utilized. The specific WMD hazards chosen for evaluation will be determined by analyzing intelligence sources, case histories, related assessment data from the scientific and health communities, and current trends in domestic and foreign WMD terrorist activity. Once a list of these agents has been developed, they will be prioritized based on the likelihood of use. These factors will be analyzed utilizing a baseline number of casualties intended by

the threat element. Scenarios will be developed for the highest threat hazards as they relate to a deployment within a contained and an open-air environment. This information will not only identify deficiencies in our capabilities to respond, but should form the framework for identifying currently unrecognized requirements in training and equipment enhancements.

Currently, the FBI has not been tasked with the conduct of a national level threat assessment. However, the FBI, along with the NDPO and representatives of our Federal partners continue to avail themselves and help coordinate participation in related projects and/or initiatives at all levels of government.

The FBI and NDPO continue to play an active role in Department of Defense's (DOD) Biological Weapons (BW) Improved Response Program (IRP). This program is a multi-year program designed to identify, evaluate, and demonstrate the best practical approaches to improve BW domestic preparedness. This group determined that a catastrophic medical emergency would quickly saturate local emergency response and medical assets unless plans to cope with such an incident are in place. Such plans do not exist at this time in most cities. Therefore, the BW IRP team identified the need for formulating a generic BW Response Template that embodies the concepts and specific

activities a city could perform to respond effectively to a BW incident. By formulating this template, the BW IRP will help identify the personnel and material resources needed to perform each response activity.

The FBI and members of NDPO have also offered their insight and expertise to the Chemical and Biological Arms Control Institute which is currently conducting a one-year unclassified study on "Bioterrorism in the United States" for the Centers for Disease Control and Prevention (CDC). The task is to calibrate the threat of Bioterrorism, develop response criteria for the health and medical dimensions of preparedness efforts that match the threat, and make recommendations for improving programmatic activities.

The FBI also participated in the CDC-led initiatives to upgrade national public health capabilities to respond to acts of biological terrorism. As part of this initiative, the CDC solicited the input of infectious disease and public health experts, Department of Health and Human Services (DHHS) agency representatives, intelligence experts and law enforcement officials to develop criteria for identifying biological agents of concern. As a result of this process, the CDC was able to prioritize critical biological agents for public health

preparedness. This list is known as the "Critical Agents" list.

The FBI has also assisted the CDC in the creation of "Recommended Notification Procedures for Local and State Public Health Department Leaders in the Event of a Bioterrorist Incident" document. This document provides a brief description of reporting procedures and interrelationships among the public health and law enforcement communities when responding to confirmed or suspected Bioterrorist incidents. These documents may further serve as a guide to establishing funding priorities for WMD response assets.

The NDPO and the FBI also play a functional role in the Environmental Protection Agency's coordination of Local Emergency Planning Committees (LEPCs). LEPCs serve as an information source concerning chemical risks in a community. The LEPC is a committee of people representing numerous occupational categories that have an interest in hazardous materials response planning, including FBI WMD Coordinators. LEPCs are working with industry and the public to encourage continuous attention to chemical safety and accident prevention. These committees are designed to facilitate emergency planning efforts at the local level, and assist with regional coordination, while helping public and emergency responders address hazardous materials public safety

issues.

In October 1998, the FBI and DoD, organized and assembled a group of federal, state and local first responders from across the country to address domestic preparedness problems and issues unique to the civilian response community. This board was named the InterAgency Board (IAB) for Equipment Standardization and Interoperability. It is co-chaired by the FBI and DoD. The main charter of the IAB is to establish, maintain and update a national standardized equipment list (SEL) for use by the interagency community in preparing for and responding to WMD incidents. The IAB is made up of hard-working professionals and experts who are dedicated to ensuring that first responders are adequately trained and equipped. The IAB also interacts with industry to provide guidance in the areas where civilian emergency responders feel their equipment needs fall short and can be improved.

The FBI has also been instrumental in establishing a working group for the development of equipment standards, where none currently exist. Among the membership of this group is the National Institute of Occupational Safety and Health (NIOSH), Occupational Safety and Health Administration (OSHA), National

Institute of Science and Technology (NIST), and National Fire Protection Association (NFPA). When standards are established, they will then have to be applied to test and evaluation protocols for validation. Once complete, industry can apply the new standards to their products to meet the requirements of the appropriate certifying or regulatory agency.

These are some of the initiatives underway that should influence the formulation of formal requirements for the development and acquisition of material and equipment for first responders. The FBI, along with all of its Federal partners, has continued to come together in an effort to develop better protocols, plans, assessments, and other tools to meet this objective. The NDPO has played a significant role in bringing this coordination about. Additionally, the FBI WMD Coordinators have provided a much needed "bridge" to the State and local communities across the United States by establishing and maintaining liaison and facilitating the formation of local working groups and task forces. This collective effort has helped all of us better understand and identify needs on a national perspective.

Mr. BURNHAM. I do work for Mr. Watson. I have got one of the section; I have got the Domestic Terrorism Section, which is part of the Counterterrorism Division. And most of what is in Mr. Watson's statement are areas that are under my responsibility.

Mr. SHAYS. So feel free to talk about them.

Mr. BURNHAM. OK, so I am going to talk about a couple of things. Again, he regrets he couldn't be here.

I guess the overriding theme here is probably defining a threat and risk, and I am going to touch upon a couple of things on that, particularly because it was brought up in the first panel here.

Mention was made of the FBI's—and this is also material that is in Mr. Watson's statement—mention was made by the first panel of a threat and risk assessment that is being done by the FBI. Specifically, that is being done now and it is being done as part of the Defense Against Weapons of Mass Destruction Act of 1998. In that, the FBI was tasked with doing a threat and risk assessment for chem-bio or radiological, whatever the threat may be in the WMD area.

After we started that, pursuant to the fiscal year 1999 State Domestic Preparedness Equipment Support Program, which is administered by OJP, that was rolled then into an overall grant package which is being administered by OJP. We finished the actual threat and risk package, gave that OJP, worked with to OJP. And by the way, the actual threat package itself, the threat and risk package, was also piloted in two cities.

After completing that, we did give that to OJP. OJP has since rolled that into their entire grant package. And starting on March 28, next week, there are five particular locations, and I don't have the locations now, where they are actually going to start—five localities around the country where they will actually start to demonstrate that and get that working.

Now, there are some limitations in that threat and risk package that we did with the locals, in that it was not your typical FBI crime survey; it was not like a lot of intelligence estimates we did. There were inherent limitations on that because of the fact that it was going to be going out to individuals who may not be in law enforcement or the intelligence community. So it did have certain limitations on it and I can discuss that more later.

The other area that was mentioned by the first panel was the General Accounting Office last fall did a study in which they pointed out, and Mr. Spencer has also pointed out, that there are intelligence estimates done for State actors and possible overseas development in the area of WMD or chem-bio. What GAO's assessment or study pointed out was there is nothing really that is done domestically as far as what is out there in the area of chem-bio.

One of the tasks that they did recommend, although we haven't been tasked with it yet, was that there should be a study or a threat and risk assessment done domestically as to what is specifically out there. The GAO report did note that over the last several years a lot of money has been spent in the area of R&D, and a lot of money in first responder training. But what were they training for? Are they training for any particular element? And that hasn't been done and we haven't been tasked with it yet, although on a

daily basis we are dealing with what I would say would be the domestic threat.

Now, we rely heavily, as Mr. Kerr has stated, on the laboratory. I have got an operational section, most of whom are not scientists, most of whom don't have the technical expertise. So we do have to rely heavily on our laboratory. And if I can give you just an example of how we work not only with our Laboratory Division but with our Federal partners, the Department of Energy, the Department of Defense, CDC, typically what we would do on our threat assessment process—and Dr. Kerr had mentioned the fact of an anthrax threat. We could get an anthrax threat in from one of our field offices. Our weapons of mass destruction coordinator may call in and say a particular hospital or doctor's office had received an anthrax threat that day.

Part of the threat assessment process on what we do is we analyze the threat from three viewpoints. We analyze it from a behavioral, a technical, and an operational standpoint. What we will do is we will contact first our National Center for the Analysis of Violent Crime, our behavioral science people, and get them involved. This is all on a conference call. We will also get possibly HMRU and NBDC involved. We will also get the Centers for Disease Control in Atlanta and do a behavioral, a technical and an operational assessment for the local field office.

In most instances, it is done for the first responder because for all intents and purposes, it is going to be the local police department or fire department that is going to receive the message. And if we have been doing our job over the last couple of years, they will contact us. We will do that, we will d a threat assessment, and we do this two to three times a week. So I think from all these threat assessments we are doing, get back to the field office.

Dr. Kerr had mentioned we did just recently have a case out in California where we did exactly that. The call came in on Friday night, indicating possible biological agents. HMRU, the Hazardous Materials Response Unit, for Dr. Kerr, were dispatched out there. We worked with the Office of Emergency Management and the local public health officials out in California. That is typically how we respond. We have been doing it in the local community, and from these I think we have a sense of exactly what is out there now, at least domestically.

I can go through figures and the actual number of cases that we have had in the last year. Predominantly, most of them have been anthrax and most of them have been hoaxes.

Mr. SHAYS. Most or all?

Mr. BURNHAM. I would say about 80 percent of our cases have been anthrax threats, hoaxes.

Mr. SHAYS. Right, and of the 80 percent that are anthrax, have all of them been hoaxes?

Mr. BURNHAM. Yes. We haven't actually—we have not had an actual case, right.

Mr. SHAYS. I just didn't want to misread your statement.

Mr. BURNHAM. No.

Mr. SHAYS. Otherwise, you have got my attention.

Mr. BURNHAM. No, no. I am sorry, no. Let me just spell out we have not had actual cases of anthrax.

Mr. SHAYS. Yet.

Mr. BURNHAM. But, again, that is part of the process and we are going through it on a daily basis, fully expecting that in the next couple of months the FBI, my section, will be tasked with doing an actual threat and risk assessment.

Those are the highlights of Mr. Watson's statement. Again, I would entertain any questions that you may have.

Mr. SHAYS. It is kind of embarrassing to have you gentlemen have to wait around. I apologize for that, but I only have one vote so I can vote and come right back and then we will do the questions. It is very important that we have this hearing, so I really appreciate you being here.

So we will adjourn for a bit and I will be back.

[Recess.]

Mr. SHAYS. I would like to call this hearing to order.

I have a number of questions I want to ask, but I think the first question is I just want to talk about what kinds of equipment we are talking about. I want each of you to describe one or two pieces of equipment that you would be dealing with.

Let's start with you, Mr. Spencer.

Mr. SPENCER. OK, I will lead off. Of course, DOD is concentrating on warfighting, and our No. 1——

Mr. SHAYS. Concentrating on?

Mr. SPENCER. On warfighting requirements, meaning warfighting needs for the commanders-in-chief.

Our No. 1 priority is in the area of detection, identification and early warning. So when we talk detection, we are talking a detection capability that provides us early warning. We need to be able to detect and identify chemical agents, toxic industrial materials, biological agents, prior to them having an impact on exposed personnel so that exposed personnel can then take adequate individual protective measures.

And that leads us into the next area, which is individual protection—clothes, boots, gloves, masks. The detectors themselves range from everything from airborne platform systems, which are basically lidar technology in nature that can send out a beam and scan the horizon to determine if there is a cloud that is not naturally occurring in nature.

We have biological detention devices, something like our portal shield device that is deployed in southwest Asia and the Korean peninsula. Those are point biological detection devices that are for fixed sites that, should they be exposed to a biological aerosol, they will alarm, they will provide an early detection capability.

In collective protection, collective protection is required—and most of us speak the same language when it comes to equipment. For example, a mash unit, emergency medical procedures. You do not want surgeons wearing protective masks, suits and gloves. They need to be in a clean environment, so you have a filtered environmental system that is self-contained so that surgeons can perform those types of operations. And that is also a valuable tool for command and control facilities, maintenance facilities, anywhere you have long-duration facilities. A good example also is the Army. All of their Abrahms armored systems have collective protection.

We have collective protection on citadels, on ships. Some aircraft have collective protection as well.

Mr. SHAYS. Thank you.

Mr. SPENCER. The last thing was decontamination, and obviously those are chemical substances that will decontaminate all known chemical and biological agents.

Mr. SHAYS. So you basically mentioned three: the detection and identification, the protective gear, and the decontamination.

Mr. SPENCER. Correct, and collective protection.

Mr. SHAYS. And what?

Mr. SPENCER. Collective protection, which are the shelters for the mash units, for example.

Mr. SHAYS. OK, so individual protection gear and collective protection gear?

Mr. SPENCER. Correct.

Mr. SHAYS. And I am going to come back to you because of the emphasis on the military. I would love to know what the implications are for civilians of what you do.

Mr. SPENCER. Certainly.

Mr. SHAYS. Dr. Stoutland.

Mr. STOUTLAND. Let me give you two specific examples, one being equipment and the other being a capability. With respect to equipment, one of our detector projects is one that we call micro chem lab CB, short for chem-bio. This will be a handheld unit able to detect many chemical agents, as well as biological toxins, including industrial chemicals as well.

Mr. SHAYS. Will it be a sophisticated, calibrated piece of equipment or is it going to be—we had the problem when we did the gulf war illnesses where we had the military people in the field hearing alarms going off all the time, and then finally they just discounted it because they were being told to discount it. And then the more sensitive equipment would come in and discount most of the readings.

So my point, I guess, is that in the end the handheld stuff, the stuff on the trucks, the jeeps, and so on, were almost useless because if they detected something, we ignored it.

Mr. STOUTLAND. Our goal is to overcome those shortfalls by using a variety of techniques. I can go into them if you want. Basically, what we are doing is we are putting the power of an analytical laboratory, for example, a gas chromatograph which is the size of a microwave oven, into a chip format. So we are moving things literally to micro chips. So something that used to be a meter in length can now be put into a 1-centimeter-squared chip. So you can then put the power on to a chip and you can do things in redundant fashion so that you can eliminate the false alarm problem.

Our goal for this particular device is one false alarm in every 10,000 measurements. Obviously, it is an R&D program. This year, we have the first prototype that will be tested this summer with live agents to see how close we are to that performance goal.

Mr. SHAYS. You wouldn't ignore an alarm like that then, would you?

Mr. STOUTLAND. That is the hope. And, again, getting back to the domestic use, what we hear from the first response personnel and others is that false alarms really are not tolerated domestically. In

the military, of course, you have got some flexibility. You can bring in other units, you can don masks while you are trying to figure out whether the alarm was real or not.

Mr. SHAYS. So are you mostly focused on civilian use protection?

Mr. STOUTLAND. Yes. Well, I will give you two examples. Our program targets civilian use. The first example is detection. The second example is a computer modeling capability. For example, we have developed extensively models to be able to predict the flow or the transport of chemical or biological agents within buildings and within subway structures.

So, for example, it lets us predict what the impact would be of a release at a given subway station, how far away will it travel, how quickly will it get there, which then aids in determining what sorts of mitigative measures you might think of.

Mr. SHAYS. So you are doing detection and identification. You are not doing protective gear.

Mr. STOUTLAND. That is correct.

Mr. SHAYS. You are not doing collective protection.

Mr. STOUTLAND. That is correct.

Mr. SHAYS. And decontamination?

Mr. STOUTLAND. We do have a decontamination effort.

Mr. SHAYS. So you are doing both of those, OK.

Mr. SPENCER. May I comment on that, please?

Mr. SHAYS. Sure.

Mr. SPENCER. Dr. Stoutland used an excellent example of micro chem lab. That is a technology that we are following very, very closely. In fact, we have contributed a significant amount of money and are working collaboratively with the Department of Energy because we at the Department of Defense see that as very promising technology for warfighting application as well.

In the area of modeling and simulation, although we are not first responders, we realize the Department of Defense will be called upon in the event of a national emergency involving chem-bio terrorism to provide assistance to State and local authorities. In that role, we are looking at modeling and simulation as well to ensure that the work the Department of Energy is doing in the domestic arena aligns with the work that we are doing, as well as we provide support. And we are working together on modeling and simulation as well.

Mr. SHAYS. Dr. Kerr.

Mr. KERR. First of all, I think it is important to recognize there are three things that the FBI has to be concerned with in its management of a crisis. The first responsibility is public safety, which leads to the issue of where is the same perimeter, do you evacuate, do you not evacuate, and can you get information quickly to inform those who might take prophylactic action.

The second thing that we are concerned with is the safety of our own investigators as they move into this crime scene or incident scene. So personal protective equipment is, in fact, a very important component of what we need for our people.

And the third thing, of course, is once on the scene we are concerned with attribution; that is, the forensics of the situation, and so more sophisticated and specific identification capabilities that might lead you back to the perpetrator.

That being said, we live on the results of the programs in the Department of Defense and the Department of Energy and what we can buy off the shelf. We are not, in fact, ourselves developing new techniques or new equipment. So it is very important for us that there is, in fact, this set of developments in the other agencies that we can work with.

Mr. SHAYS. Mr. Burnham.

Mr. BURNHAM. Yes, to follow one step further on what Dr. Kerr——

Mr. SHAYS. I am sorry. So you are not into detection and you are not into decontamination and you are not—of the three outlined by Mr. Spencer——

Mr. KERR. We are very much into detection and identification, but the kits that we are now using in the field were developed, for example, by the Naval Medical Research Institute, in Bethesda.

Mr. SHAYS. Are you DOD's customer?

Mr. KERR. What happens is that DOD will in many cases develop a capability and we will go to the same vendor either as part of their procurement or as a separate procurement. There may be a little bit of specialization for us, but in general we try to use the same capability.

Mr. SHAYS. Thank you.

Mr. BURNHAM. To carry one step further what Dr. Kerr was talking about as far as on the crime scene what they came across, what the element is, I think the most important thing that we can do, the FBI, through our WMD coordinators, is impart that information to State and local responders. I can give you several examples.

In the last year, we had dispersions of some type of chemical in a number of movie theaters throughout the Midwest. Once we saw a pattern where there were three or four of them, we deemed it to be important enough to get out Bureau-wide through all of our field offices—to get that information out to the local responders. As it turned out, it was more of a labor relations matter, but I think it is important.

We see this in nationwide cases. Be they anthrax threats, or other patterns, I think it is important that we get that information out, and we are. From that I think the local responders as well as the FBI can then gauge what kind of equipment they need. Again, we would have to rely on Dr. Kerr and HMRU, but I think the important thing is to get the information out, which I believe we have successfully through our WMD coordinators, as well as through the National Domestic Preparedness Office [NDPO].

Mr. SHAYS. I am just deciding which level to go. This is a digression, but I do want to ask now, Dr. Stoutland, I don't know if you made reference the Europeans or if it was you, Dr. Kerr.

Mr. KERR. I did, yes.

Mr. SHAYS. Is Great Britain ahead of us, is France ahead of us? I will tell you why I ask this question. When we went to view how they respond to the whole issue of dealing with gulf war illnesses and protective gear, and so on, I had a sense that the Brits and the French believe this kind of attack is likely to happen, and I think they are more sensitive to it than I think our general population is. I mean, that is just my own view.

I am just curious. Are they ahead of us, behind us, parallel to us?

Mr. SPENCER. Dr. Kerr, can I address that? I think Dr. Stoutland and I can probably do a better job of addressing that question.

I have a requirement for the Department of Defense to monitor all the chem-bio science and technology development programs internationally as well. As part of that responsibility, we have over 50 data exchange agreements in science and technology for chem-bio defense throughout the world. We also have a number of cooperative R&D programs, and we watch very, very closely and work very, very closely especially with the Brits and especially with the French, and the Canadians as well, as part of a memorandum of understanding that is a formal agreement between us.

I can give you my professional and my personal opinion on the status of their R&D programs. Generally speaking, the rest of the world is following the U.S. lead. They are looking at where we are going, they are looking at the technologies that we are developing in the basic sciences as well as in the advanced sciences.

In the area of biological detection, identification and early warning, and addressing the entire biological threat, I personally feel we are 3 to 5 years ahead of them. In the chemical technology arenas and chemical protection arenas, they are pretty close in some areas.

Mr. SHAYS. Well, in some ways they are ahead of us. I mean, the fact is our masks don't work as well as some of theirs. The fact is they have protective gear that is two-ply, and it doesn't have charcoal and can be worn as a general uniform. I am speaking of the French.

Mr. SPENCER. Correct. They are very, very proud of their technology developments. They have been very generous and have provided us much of their newly developed equipment and the equipment that they currently have in advanced development. We have performed similar tests as well.

Mr. SHAYS. Dr. Stoutland.

Mr. STOUTLAND. I have been personally both to the UK and to France over the last year to look at the exact issue that you have addressed. With respect to R&D in particular, I would not disagree with Carmen. I think there are some things that the British in particular do very well, and we are in the midst of signing a memorandum of understanding with them so that we can more closely share information and proceed jointly.

With respect to public awareness, my observation has been that they are a bit behind us, in fact.

Mr. SHAYS. On what?

Mr. STOUTLAND. With respect to public awareness and concern over the threat, my personal observation has been that we are a couple of years ahead of them, if you will. For example, in France there is a new commission called the Haute Commission Francais de la Defense Civile, which is sort of the high French commission for civil defense, and they have just now stood up and are really starting to move forward. So I think they are a couple of years behind in terms of awareness of the threat, but they certainly have some capabilities that we are aware of and we will be making use of.

Mr. SHAYS. But when you go through Paris and you see their police carrying assault weapons, it is not like they are going after the common criminal.

Mr. STOUTLAND. Well, I will defer to the FBI for sort of broad terrorist awareness. But with respect to chemical and biological threats in particular, my observation has been that on a national level they are now taking it much more seriously than they did 2 or 3 years ago.

Mr. KERR. Let me speak briefly to the question you initially asked, which is areas——

Mr. SHAYS. And candidly.

Mr. KERR. Yes, right. With respect to the United Kingdom, we work very closely with them in bombing matters because they have more experience with terrorist bombings than anyone that we know of. We send U.S. bomb techs to their schools. We adopt some of their equipment and adapt it to our use. Similarly, in some of the detection areas they have had activity that for us has been quite useful.

The partners that work most closely, of course, are the UK, Canada, Australia, and the United States. And there are, in fact, working agreements——

Mr. SHAYS. Say that again. You left out France?

Mr. KERR. Correct. France is not part of what I will call the inner close working group. Maybe it is an Anglo-Saxon bias, maybe it is a harmonization of the legal systems, but there is, by tradition and past agreements, more of an open interchange there than with the French.

Mr. SHAYS. When I was in France talking with personnel who deal with both chemical and biological and the nuclear threat, one of their warnings to us was that we can win the traditional war, but then be exposed to the terrorist threat out of frustration by our success militarily and just getting us to have a perception that it only takes a few people.

And so I just found it interesting how sensitive they were to the reality that there will be a nuclear, biological, or chemical attack on some Western country sometime. I am also struck by the fact that when I went to a base in Mississippi, I saw the finest firefighting equipment for our planes, and I saw a crew of just outstanding firemen at this airport. And I thought they may never, ever have to use their equipment, but they prepare everyday as if they do.

I was thinking as you were talking that if there were such an attack, you all would be right up there on the firing line and then there would be people writing articles about who are these people and what have they been doing for the last so many years.

I want a handle on what we are spending in this area. I mean, this isn't classified information, so give me a sense of what we are devoting in each of your units.

Mr. SPENCER. What I will share with you is the fiscal year 2001 President's budget submission for the Department of Defense in this area.

Mr. SHAYS. OK.

Mr. SPENCER. For the joint NBC defense program, which is the program that I manage, in the area of very basic research—this is laboratory-level research for chem-bio—about $33.2 million for fis-

cal year 2001; in the area of applied research, $73.6 million; for advanced development programs, $46.6 million; for what we call demonstration validation of the technologies, $83.8 million; for engineering management development, which is actually putting the technologies into the widgets and doing the final operational and developmental testing, $100.8 million; and for overall management of the program, publication of doctrine, training requirements and the training base for chem-bio defense, about $23.9 million, for a total of $361.9 million for research and development.

But probably more importantly, we are going to be spending $473.9 million to physically procure new equipment and putting it into the hands of the warfighters in all of those areas I discussed—detection, identification, early warning.

Mr. SHAYS. In next year's budget or this year's budget?

Mr. SPENCER. I am sorry. This is for fiscal year 2001.

Mr. SHAYS. 2001, OK.

Mr. SPENCER. This is the President's budget, and that total is $835.8 million.

Mr. SHAYS. So a little more than half is for procurement?

Mr. SPENCER. Correct.

Mr. SHAYS. And is any of that procurement for non-defense personnel or is it all for defense?

Mr. SPENCER. It is all for defense, but it does include, for example, procurement for our civil support teams, formerly known as raid teams, for the domestic mission.

Mr. SHAYS. These are the National Guard units?

Mr. SPENCER. Correct.

Mr. SHAYS. Yes.

Mr. SPENCER. It also includes some procurement for some of our specialty units like the Marine Corps CBIRF units, Chemical and Biological Incident Response Force. It includes procurement for the Army's technical escort unit which has worldwide deployment capability in the area of chem-bio defense, and also for USAMRIID, the U.S. Army Medical Research Institute for Infectious Diseases, which responds around the world to biological incidents as well.

Mr. SHAYS. Dr. Stoutland, can you talk about your budget at all?

Mr. STOUTLAND. Our budget request for the area that I described, that being R&D and the demonstration programs, is $42 million in fiscal year 2001.

Mr. SHAYS. And that is the extent of your budget?

Mr. STOUTLAND. Right.

Mr. SHAYS. Dr. Kerr, you have a little more amorphous area of activity.

Mr. KERR. It is more amorphous, but it also pales in comparison to the numbers that you just heard. The identified increment for counterterrorism R&D is about $5 million in the Bureau. That is not the extent of all that we put into the capabilities that we field because we use some of our base funding that is accounted for quite differently.

But, you know, one way to think about the FBI is that about 65 percent of our budget pays for agent and support personnel. The consumables go for the rest, and so we are not an R&D organization and it is an apples and oranges comparison here.

Mr. BURNHAM. Sir, I can get you the budget for the Counterterrorism Division. As Dr. Kerr indicated, some of that bleeds over from the laboratory. I am going through the process now for the 2002 budget and the cross-cutting. To give you an example, in the Counterterrorism Division I have had to meet with the Investigative Support Division, which is intelligence; with our Critical Incident Review Group, which is CIRG; with the laboratory, all of which would go into our counterterrorism efforts. But we do have that broken out. We are going through that now and I can get you 2001 budget and it is broken out by different divisions that contribute to the counterterrorism effort.

Mr. SHAYS. We don't have the Technical Support Working Group here today, a representative from it. How do you all interface with that Group?

Mr. SPENCER. The Department of Defense interfaces with them. They have a chemical and biological, radiological and nuclear countermeasures subgroup. We are a member of that subgroup and work in this arena with them. That includes the Department of Energy, the FBI, the Department of State, the Department of Agriculture, EPA, Customs, the Postal Service, FDA, the Centers for Disease Control, and FEMA.

Mr. SHAYS. Agriculture because of——

Mr. SPENCER. Domestic biological terrorism.

Mr. SHAYS. Right, OK.

Mr. STOUTLAND. That is basically true for us as well. We have a representative. In fact, DOE is one of the co-chairs of the TSWG, at the working level we have representatives on the appropriate subgroups, including the chemical and biological, radiological subgroup.

Mr. SHAYS. Dr. Kerr.

Mr. KERR. The FBI is also one of the four executive members of TSWG, and then our people have served as co-chairs of things like the chemical and biological, radiological subgroup.

Mr. BURNHAM. From the Counterterrorism Division, our representative is the laboratory, Dr. Kerr.

Mr. SHAYS. How is the nature of the threat, which gets me to your point—you focused primarily on defense. I am not clear yet, and maybe we don't have a panelist here that—maybe I don't have a complete panel to answer this question, but I want to know the difference between the civilian customer and the military customer.

Mr. SPENCER. My customer is obviously the military customer, and my threat is basically a compilation from the intelligence community. The intelligence community—DIA, CIA, NSA—postulate a threat. That threat then receives what we call a validated—becomes a validated threat list after review by the Joint Chiefs of Staff.

That validated threat list is a prioritized threat list, and that is the master threat-based list that we use to develop our research and development programs to counter. And that is both for chemical threats as well as for biological threats.

Mr. SHAYS. I guess what I am asking then would be, before I go on, the need of your customer, the military, is on the battlefield.

Mr. SPENCER. Correct.

Mr. SHAYS. It is not in the basement of the World Trade Center.

Mr. SPENCER. That is correct. The Department of Defense does have some units that we know will be responding to a domestic emergency in the chemical and biological arena, if requested. We also look to provide them the capability to provide that desired response. Those are the units like the TEU, the Technical Escort Unit, the CBIRF, the USAMRIID, and we look for specialized equipment to enable them to do that. The basic threat, though, domestically, as well as for worldwide, although not regionally focused, is primarily the same.

Mr. SHAYS. I am not sure I agree with that. I mean, it is the same because?

Mr. SPENCER. The same types of toxic chemical substances and biological pathogens.

Mr. SHAYS. Right, OK. I just see them being delivered in different forms and I see them——

Mr. SPENCER. Absolutely.

Mr. SHAYS. I would think the exposure would be greater on the military. I have no way of knowing, but it would strike me that way.

Dr. Stoutland.

Mr. STOUTLAND. First of all, there are many obvious similarities, but I think there are some important differences and I will just describe those.

Mr. SHAYS. First off, who is your customer?

Mr. STOUTLAND. We perceive our customers to be the broad domestic preparedness community who would be involved in protecting a city, and within that it would include some Federal agencies. For example, we consider the FBI to be a customer, but also local entities, and that changes depending on what the city looks like.

For example, in the city of Washington it would involve a mixture of people who own facilities that need to be prepared; for example, subway systems. It would involve first responders, be they firemen in some cities or policemen in other cities. So it is a mix, but broadly it is those type of people who would either be involved in preparing for, meaning continually monitoring because they have a building or a facility they consider to be at risk, or people who would rush to the scene should there be an incident.

Mr. SHAYS. Well, before you go on, given that, you said your budget was basically 42?

Mr. STOUTLAND. That is correct.

Mr. SHAYS. But that is basically research and development?

Mr. STOUTLAND. That is correct.

Mr. SHAYS. OK. Someone else is procuring from you? This isn't procurement. You didn't give me any figure on procurement.

Mr. STOUTLAND. Our budget does not have procurement.

Mr. SHAYS. So is that kind of like with the anti-missile defense system? I mean, we are still in research and development, not into procurement?

Mr. STOUTLAND. No. I think there are two issues here. There certainly is procurement going on, and within cities it goes on in a number of different ways. It goes on in local budgets, be they local fire departments having money to procure items.

Mr. SHAYS. But they are not buying from you?

Mr. STOUTLAND. They are not buying from us, no. Our model is to first of all do development until it gets to a stage where we think it is ready for use, and then to move these things into what we call the demonstration phase. So, for example, our demonstration program that I highlighted which looks at subways will put in place chemical detectors, computer models, and so on. Some of those things will be from our program, some of them will be whatever is required to fill out the entire system.

Mr. SHAYS. But we haven't yet perfected those models, have we?

Mr. STOUTLAND. Sorry?

Mr. SHAYS. Have we perfected the equipment that you are researching yet? Are we in a stage to develop them?

Mr. STOUTLAND. There are things in different stages. Let me give you two examples. Some things will never be fielded operationally with a first responder. For example, computer models will be run that will then result in guidance that they will use on a day-to-day basis. Those things are ready.

In other cases we have built, for example, a handheld biological detector where we have built several units, and this year we will be giving those to responders and various people around the country as a beta test. If that beta test pans out and people perceive this to be a valuable piece of equipment, then it will be transferred to the commercial sector and they will produce them. DOE is not in the business of producing many copies.

Mr. SHAYS. I am getting the sense, before I go to the FBI, that we are at a stage where DOD has developed some equipment and is starting to procure, obviously. So it is still going to be in the hands of DOD. You are in the process of researching and testing and getting out in the field some test.

But it leads me to believe that right now the only groups that would really have this equipment at any level would be responders from the Federal Government, not necessarily from the local and State. That is kind of the sense I am getting.

Mr. STOUTLAND. That is not entirely true. The examples I gave you, both the subway, where we are working not with the Federal Government but with transit agencies, which I would consider to be local people—our capabilities are getting into their hands, first, in the form of improving their preparedness plans. The second example, the handheld bio detector, will involve some Federal people, but the majority of people receiving that will be State or primarily local responders.

Mr. SHAYS. But it is "will be."

Mr. STOUTLAND. Excuse me?

Mr. SHAYS. It is a "will be," it is not "already have."

Mr. STOUTLAND. That is correct. The bio detector, in particular, will be——

Mr. SHAYS. That is my point. Right now, I feel like we are kind of vulnerable, that we have not yet reached the point where we are out there yet.

Dr. Kerr, is that accurate? Particularly with a $5 million budget, that is pretty pathetic.

Mr. KERR. Well, our model is a little different. As you know, we have 56 field offices around the country, and so the first thing we have been doing as we have gained new equipment and capability

is push it into our field offices because that way it gets tested on the street.

Mr. SHAYS. Yes, but you don't have that equipment yet.

Mr. KERR. Oh, yes, we have first-generation equipment. We have, in fact, trained up full HAZMAT teams at the 15 largest field offices. They have a first-generation biological detection capability that is what the Navy had developed some years ago. They have radiation detectors of two different types and they have personal protective gear.

In turn, those people then are training their counterparts in the State and local agencies, and for them we have been procuring personal protective gear, a simpler form of radiation detection. We do not yet have a biological detection capability to share with them.

Mr. SHAYS. Yes, and I would just emphasize it is first generation.

Mr. KERR. Correct.

Mr. SHAYS. And you all are working on what generation?

Mr. SPENCER. We are in the process of fielding an improved first-generation bio detector now, and we will be fielding in about 2 years our next generation.

Mr. STOUTLAND. Our program, I would say, is a combination of first and second generation. We are seeing some of the first-generation things now coming out. We have given a number of things to response personnel, first responders rules of thumb for what they should do based on extensive calculations, and so on. But really the bulk of our program is going to be delivering things in the next couple of years. The program is 3 years old. We have set our program targets for programs or projects that are 3 to 5 years out that will make major capability enhancements, and so things are now just beginning to get out of the R&D pipeline.

Mr. SHAYS. So let me ask you and Dr. Kerr again, because I didn't really pursue it enough, how is the nature of the threat different to the civilian versus the military?

Mr. STOUTLAND. I would divide it into three areas and maybe give a couple of specific examples. One is "what?" I mean, I think the list of agents—particularly in the chemical area, one can imagine a much broader set of agents that could have very dramatic effects in confined urban spaces. Obviously included in those would be industrial chemicals, and so the detection capabilities, for example, need to not only do the conventional CW threat agents, but a broader set of agents.

The other point would be where things are going to be used. If they are going to be used in confined urban areas, be they inside of buildings or inside of subways, that requires a different set of capabilities both in terms of detection, because false alarms is a problem inside of buildings with outgasing of materials, and so on, as well as with the various modeling calculations that would help you to characterize the threat.

And, finally, the differences with who is going to use the capability. First responders and others have very different training in many cases than those in the military, and we must develop equipment that is suitable for their level of training and expertise.

Mr. SHAYS. So one of your points would be that the civilians will not have the same capability of training?

Mr. STOUTLAND. No, no. It could be better. My only point is that it is different.

Mr. SHAYS. OK, fair enough.

Mr. KERR. Having participated in the Defense Science Board for a number of years before I came back to Government, I was involved with many studies of urban warfare and what the military has called operations other than war. And I would argue that their thinking about the role of chemical and biological threats in that environment is virtually identical to the civilian issue that you are asking about.

The difference in detail is that they are thinking about it in terms of a conflict situation. In law enforcement, we have to think about it in terms of it being embedded within the larger civilian population whose safety we have to assure first. So there is some difference in the amount of equipment you would need for, if you will, the first crude detection in order to set up a perimeter for safe access. But the specific threats, the so-called threat list, whether it be biological or chemical, is virtually the same, augmented in the chemical area by some of the industrial chemicals like chlorine. With respect to radiological dispersal, the ability to detect radioactive materials on the battlefield or in a city is no different. The same laws of physics apply.

And the other thing I should point out is that we also have to deal with some of these things in conjunction with one another. We have had threats where we have responded which have been a combination of explosives and suspected biological material. We do have some 2,500 bombings a year in the United States, which is part of our backdrop in the counterterrorism program.

So one way we look at this problem of high consequence and so far low probability event is that we ought to be incrementally adding capability, but we should not be withdrawing capability from the threats that we are facing everyday.

Mr. SHAYS. Thank you very much.

Let me ask this question, and we are getting to a close here. Who in the U.S. Government is in charge of ensuring the coordination of R&D efforts for the military and the civilian requirements?

We will start again with you, Mr. Spencer.

Mr. SPENCER. Under the National Security Council——

Mr. SHAYS. Let me just say the pregnant pause is very telling. It is, it is, and it is not a criticism of anyone; it is just telling.

Mr. SPENCER. If you are looking for one individual to be in charge to ensure that the Department of Defense, the Department of Energy, and the Department of Justice are all working toward the same common goal, and that common goal is domestic preparedness, I believe that would come under the National Security Council. And they have established seven working groups that are looking at all aspects of this particular issue. But, again, that is one body. They have visibility. They do not have decisionmaking authority, nor do they probably have the resources to do what is actually required.

Mr. SHAYS. It sounds to me like you are just saying the President has the responsibility.

Mr. SPENCER. No. There is an individual that has been designated, and that is Mr. Dick Clark.

Mr. SHAYS. Right, but does Mr. Clark have this responsibility?

Mr. SPENCER. Yes.

Mr. SHAYS. Do you think he knows he has the responsibility?

Mr. SPENCER. Yes, I do. I think if you take a good external look at the programs, I think at the scientific level when you talk about the science and technology, the scientists working for the Department of Defense are working very closely with the scientists in the Department of Energy, and the FBI is a customer for both of us.

As you work your way up in the bureaucracies, there are bureaucratic mechanisms that are in place that physically look and attempt to assure that the proper coordination is taking place. But the bottom line to really the whole effort is—and a good example of this and probably the best example occurred in the last 30 days.

In the last 30 days, we had what we call a technical area review and assessment, where I had my principal scientists for every one of our programs brief a scientific panel of non-DOD, non-Government personnel. And the panel also had a representative from the Department of Energy on it, from academia, as well as from industry.

The scientists briefed, are we going in the right direction? They briefed their program and they looked for opportunities to improve leveraging what is going on in academia and industry and internationally. Also presenting at that week-long effort was the TSWG. The Department of Energy briefed their programs, and at the scientific level that exchange is taking place and it is a very positive exchange. Redundancy in all cases is not bad, especially when you look at high-risk technologies, and there are high-risk technologies involved in biological defense.

That is an excellent example, but if you look above that level within the Federal Government, I think there is probably a void.

Mr. SHAYS. Probably what?

Mr. SPENCER. Probably a void.

Mr. SHAYS. And that void again is where? I know you used the word "probably."

Mr. SPENCER. I am going to qualify my statement.

Mr. SHAYS. Sure.

Mr. SPENCER. We have the Counterproliferation Review Committee with the senior executive levels of the Department of Energy and the Department of Defense that they participate on, and that coordination is working well.

What is really lacking, and I think what you are really looking for is what we are all striving toward, and that is there is no national architecture. What is the national capability for domestic preparedness that is desired by this Nation for chemical and biological antiterrorism and counterterrorism activities? To what capability should the Department of Energy, under Presidential Decision Directives 39 and 63, be developing a defensive capability for the United States? That national architecture does not exist.

Mr. SHAYS. Fair enough. That is very helpful.

Dr. Stoutland, do you want to respond in any way?

Mr. STOUTLAND. I will agree, first of all, with what Mr. Spencer said and maybe add just a couple of things. My observation is that at the working level coordination is working very well. People are

not duplicating projects. Scientists talk regularly, whether they be from Justice, Energy, or Defense-sponsored programs.

What we are lacking, as was pointed out, is a high-level architecture for where we are going so that we know what the targets are, and that is exactly the purpose of the study that is now being jointly funded within my program and within the Defense Threat Reduction Agency, a study that call the Defense of Cities Study, to try to develop a framework so that we can compare in a rigorous analytical manner various high-level policy options to present to policymakers to then make decisions as to what our level of preparedness should be, which then feeds back into my R&D program and others so that we know where we are going.

In addition to that, the Counterproliferation Review Committee group was mentioned. This year, at the urging of my Under Secretary Moniz and Under Secretary Gansler, of the Department of Defense, we formed a chemical and biological defense focus group. The purpose of this group is really to focus specifically on chemical and biological areas, with the goal over the next year of developing integrated R&D road maps in a number of areas where we both have programs going on with different missions, different technologies, but to look, in fact, at where there are intersection points where we can benefit to a greater extent from the other agency's programs.

So I think that is a very positive step that has now been approved at the highest levels of Defense and Energy. And, of course, we will be vetting that with the NSC-led Weapons of Mass Destruction Preparedness Group, including the Office of Science and Technology Policy which chairs the R&D subgroup.

Mr. SHAYS. Dr. Kerr or Mr. Burnham, either one of you?

Mr. KERR. I think I will take it and I will do it on a slightly different tack, not to disagree with those who preceded me, but there are a couple of people who have made a difference in this area. One is the present Deputy Secretary of Defense John Hamre. Another, working with him, has been the Attorney General, and they have had now two Saturdays this past month a major WMD exercise bringing Justice and Defense and other agencies together, thinking about not just technology and R&D, but thinking perhaps beyond that, how will it be used, what are the operational and policy implications of what is being discussed.

They have been meeting regularly about every 6 weeks for the past year in order to try to harmonize the needs of the law enforcement community and the tremendous capabilities resident in the Department of Defense.

Mr. SHAYS. Yes. I read that, though, differently. I read that as a very sensible thing to do because there is somewhat of a void.

Mr. KERR. Right, and what I was trying to do was point out that some individuals, by name, have tried to fill that void.

Mr. SHAYS. I have got you, I have got you.

Mr. KERR. Yes, sir.

Mr. SHAYS. Then let me ask you who should do it. That will probably be my last question, but the issue is who should be doing that? It is not going to be the Technical Support Working Group. It is not going to be that. Who should it be, in your judgment?

Mr. KERR. I think the voice that has been missing in the discussions that have gone on between the Department of Energy and the Department of Defense has been, in fact, the voice of those charged with the crisis management responsibility. We have to find a way to bring the Department of Justice into that discussion, recognizing that unlike the other two, it is not an acquisition agency, it is not an R&D agency. Yet it is, in fact, desperately dependent on what can be produced by those who do it so well. And we have to get that coupling not just at the working level, which is the TSWG, but at the policy level where people like the DOE and DOD Under Secretaries have an effective relationship today.

Mr. SHAYS. Dr. Stoutland, who do you think it should be?

Mr. STOUTLAND. I am sorry. Who should coordinate this?

Mr. SHAYS. Yes.

Mr. STOUTLAND. I think it needs to be led at the level that it is being led at, that is the President's coordinator for counterterrorism, Richard Clark.

Mr. SHAYS. And let me just say I realize that Mr. Clark is working hard, but chooses to have a low profile. He is not looking to be called the terrorist czar, but it may make sense for our committee to ask him this same question and really get a sense of how he weighs in on this.

This is a question that I would love answered ultimately, and it is too serious a question and too important a question not to feel certain about it. But I just think this is a very telling conversation, in a way, because you are all kind of wrestling with it, but nothing comes quickly to mind.

Mr. STOUTLAND. Well, that is right, and what I won't do is suggest maybe a particular mechanism that would solve all of our problems because if we knew that, obviously we would be more than willing to put it forward.

Mr. SHAYS. And I realize that you all work for bosses who may have a different opinion.

Mr. STOUTLAND. I think what this is more telling of is the complexity of this problem. We have presently got a number of coordinating groups, some of which are quite effective. I think the Counterproliferation Review Committee is an effective group, but focused not on the domestic problem. I think the Weapons of Mass Destruction Preparedness R&D Subgroup is also an effective group which builds upon the CPRC.

But I think ultimately the fundamental challenge and one that we have not grappled with as well as we could have is trying to figure out how to make the lash-up between those organizations with scientific and technical capabilities, represented to the most extent here by DOE and DOD, with those organizations with operational responsibility, which would include the FBI as well as State and local responders. That is hard thing to do. I think we are working toward it and we are making progress, but we are going to continue to struggle with that.

Mr. SHAYS. This is a nice lead-in to what I will see on Friday and Monday when we have our hearing. We are going to be seeing how the fire departments and the police departments all interact in this effort to deal with a terrorist threat.

What is helpful for me is to know that if I were on the outside looking in and saying, well, the Technical Support Working Group, there is someone in charge and they should be doing that, I think there is consensus that it is not that organization that I should be looking at. So this is something the committee will do, and I think we will have further dialog.

I am prepared to close the hearing, but as is my practice, I am very happy to have you make any closing comments, if there is any question that we should have asked that you were primed to answer or just feel you need to answer. Is there anything?

[No response.]

Mr. SHAYS. Well, I thank you very much. I think we are all hungry, and you were a wonderful panel. Thank you for your patience.

[Whereupon, at 1:42 p.m., the subcommittee was adjourned.]