

Opening Statement of

George E. Thompson

Deputy Director (Plans and Programs), Homeland Security Institute

Before the House Committee on Homeland Security

**Subcommittee on Emerging Threats,
Cybersecurity, Science and Technology**

**Nuclear Smuggling Detection:
Recent Tests of Advanced Spectroscopic Portal (ASP) Monitors;**

Final Report of the ASP Independent Review Team (IRT)

March 05, 2008

Statement of George E. Thompson
Deputy Director (Plans and Programs), Homeland Security Institute

Introductory Remarks

Mr. Chairman, Representative McCaul, and distinguished members: Thank you for the opportunity to address the Subcommittee on the subject of the Advanced Spectroscopic Portal. My name is George Thompson, and I am the Chair of the ASP Independent Review Team (IRT). Our Final Report was delivered to you and your staff last week. The report is considered For Official Use Only, so I will be providing a general overview rather than a detailed description of the team's findings.

An independent review is a valuable source of advice for decisionmakers—but only if the experts on the review team are truly expert, and only if the advice they provide is truly objective. So before I talk about our findings, I'd like to describe the IRT itself and process that was used to conduct the review.

The Independent Review Team (IRT) Chair

As Chair of the IRT, my own role was to help frame the issues and integrate the contributions of the IRT members into a coherent report. I also contributed substantively in those areas in which I am personally knowledgeable. My formal background is in Applied Mathematics. I have spent the last 30 years as a practitioner of Operations Analysis, which is really just disciplined problem-solving, using the tools of mathematics, probability and statistics, simulation modeling, and systems analysis—with a healthy measure of critical thinking and common sense thrown in. I am currently a Deputy Director of the Homeland Security Institute. The Institute is what is known as a Federally Funded Research and Development Center (FFRDC). It was established in 2004, pursuant to section 312 of the Homeland Security Act, which specified that the Institute was to be administered by the Science and Technology Directorate on behalf of the entire Department of Homeland Security (DHS). Thus, at the same time it established

DHS, the Congress wisely foresaw the need for the Department to have a knowledgeable, independent and objective source of expert technical advice on complex homeland security problems—and that is the mission of the Homeland Security Institute.

In September 2007, Mr. Paul Schneider, then Under Secretary for Management, asked me to serve as the IRT Chair. At that time, the review had already been underway for several weeks. Two other individuals, Dr. Pete Nanos of the Defense Threat Reduction Agency, and Mr. John Higbee of the Defense Acquisition University had, in turn, served briefly in this role but had to withdraw their services.

The IRT Members

When I accepted the role of IRT Chair, one of my first actions was to review the qualifications of the team members that had already been selected by my predecessor. They were, in a word, outstanding.

- Dr. Alan Berman of the Penn State Applied Research Lab is a renowned expert in signal processing who has served on numerous advisory panels for the U.S. Navy and Office of the Secretary of Defense.
- Dr. Dennis Slaughter, formerly of the Lawrence Livermore National Laboratory, is an expert in low energy nuclear physics and cargo security.
- Dr. Peter Vanier of Brookhaven National Laboratory is an expert in the detection of nuclear weapons. He is also a member of the so-called Regional Reachback team that analyzes gamma-ray spectra submitted by state and local law enforcement organizations.
- Dr. Michael Wright of Oak Ridge National Laboratory is another Reachback analyst who is also expert in instrument development and systems integration.
- Dr. Klaus-Peter Ziock of Oak Ridge is a recognized authority on the subject of systematic noise and its impacts on radiation detection.

These individuals are certainly well-qualified in the basic science of nuclear detection.

However, it was clear to me that the review would also need to consider important issues involving acquisition management, systems engineering and the basic principles of test and evaluation. Accordingly, I asked three other individuals with distinguished careers in the Department of Defense (DoD) to serve as reviewers of the draft report.

- Mr. Thomas Christie was formerly the DoD Director of Operational Test and Evaluation.
- Mr. William Houley was the first Director of Defense Acquisition Reform and a former Director of Test and Evaluation on the staff of the Chief of Naval Operations.
- Dr. Marion Williams was formerly Chief Scientist and Technical Director of the Air Force Operational Test and Evaluation Center.

In addition, a small group of technical support analysts—Mr. James Hurd, Mr. Bruce Shelton, and Ms. Georganne John—provided valuable assistance in areas such as systems engineering, process modeling, and program management.

Ensuring Objectivity and Independence

All these individuals—and indeed, all individuals who had access to the study in progress—were required to execute strict conflict of interest and nondisclosure agreements. As IRT chair, I had full visibility into the team’s deliberations, and at no time did I observe anything less than an intellectually honest and open discussion of the issues.

The DHS Undersecretary for Management provided the team a Terms of Reference memorandum, which spelled out the specific questions to be answered. However, the IRT had free reign in answering those questions, and the Undersecretary made it clear that the team was free to offer any other observations we saw fit to provide.

Report Chronology

During the roughly two-month period from late August to late October, the team reviewed over 120 documents including test plans, test reports, directives, technical reports, briefings, and spreadsheets. (Further details are contained in Section II.B of the report, and a complete listing is at Appendix 4.) We conducted interviews and technical discussions with key staff from the Domestic Nuclear Detection Office (DNDO), Customs and Border Protection (CBP), the Pacific Northwest National Laboratory, the National Institute of Standards and Technology, the Department of Energy's National Nuclear Security Administration, and others. (The report lists the dates of the key meetings.) Team members traveled to four ports of entry to observe both first-generation systems and ASP units in operation. (Again, for full details, see section II.B of the report).

At the time, our goal was to complete the report by mid-November, to inform a certification decision by Secretary Chertoff. (As you know, the Fiscal Year (FY) 2007 Appropriations Act contained language requiring the Secretary to certify to the appropriations committees that the ASP represents a "significant increase in operational effectiveness" compared to first-generation radiation detection and identification systems.) However, in early November, as we were drafting our report, the IRT learned that the Secretary had chosen to defer that decision. Nonetheless, Ms. Elaine Duke, Deputy Under Secretary for Management, asked the team to complete the report, since its findings could still be used—for example, to improve a new round of ASP testing. We delivered an interim report on November 19, 2007.

During the remainder of November, December, January, and early February, DNDO and CBP reviewed the interim report. They discussed its contents with the team, and provided some additional data. DNDO and CBP delivered a written response on February 15, 2008. (That response is included in the report as Appendix 8.) The team carefully considered each statement in the response and decided whether to make changes as a result. (See Appendix 9 of the report.) In some cases, the team agreed with DNDO

and CBP, and revised the report accordingly. In other cases, we disagreed with a DNDO and CBP statement; however, we could see the need do a better job in explaining our ideas. In all cases, we were careful to explain why we agreed or disagreed, and what changes (if any) we made as a result.

We delivered the Final Report to DHS on February 20, 2008.

Scope of Review – Primary and Secondary Screening

Section I.C of the report describes which topics were studied, which were not, and why. It is important to understand that our assessment of ASP performance concentrated on the use of the ASP in the so-called Secondary screening role: Primary screening *detects* the presence of radiation in cargo; Secondary screening *identifies* the isotopes to determine whether or not there is a threat.

One reason we focused on Secondary screening was DHS's intent, as of last Fall, to make an initial deployment to Secondary in order to gain greater operating experience with the ASP. We were charged with informing that decision. Another reason is that, in our judgment, the existing test data are insufficient to assess the operational impact of using the ASP in the Primary role. Section V.C of the report discusses the potential benefits and risks associated with using ASP in the Primary role, and the reasons why we believe that additional testing and analysis is needed.

Overview of Report

The report includes a chronology of events associated with the review itself, a description of the process used to ensure quality and objectivity, a summary of our technical approach, the system-of-systems framework that we developed in order to assess the operational significance of improved detection and/or identification capability, and, of course, our independent assessment of the ASP test procedures and the test results.

A series of appendices provides additional technical detail, as well a list of source documents, biographies of the team members, and a copy of the Conflict-of-Interest / Non-Disclosure Agreement (COI/NDA) form that each of them was required to complete. As mentioned previously, the DNDO and CBP Response to the interim report is included as an appendix, as is the IRT's assessment of that Response.

The report findings are organized around the Terms of Reference (TOR). The TOR asked the team to do two things: first, assess the ASP testing approach; and second, compare the performance of the ASP to first-generation radiation detection and identification systems.

Report Findings – ASP Testing Approach

The IRT identified several aspects of the overall testing approach that we believe could and should be improved. In general, these include a broader characterization of system performance and a stronger linkage between test results and operational outcomes. We developed an operational process flow and proposed scoring schema that we believe could help DHS do a better job in assessing the operational impact of the ASP. We also looked at the test procedures that were used in 2007. Although those procedures were not ideal, we did not find any evidence that the test results were thereby biased or manipulated.

Report Findings – ASP Performance

In assessing ASP performance, the IRT considered both security (minimizing the chance that a threat would be allowed to enter the U.S.) and commerce (minimizing the unnecessary screening and inspection of innocent cargo). We identified the key variables and made an independent estimate of ASP impacts on security and commerce based on test data, operating experience with first-generation systems, physical first-principles, and other factors. As noted earlier, our assessment of performance assumes that the ASP is

used in the Secondary screening role, to replace the hand-held systems that are currently used.

In general, we found that the hand-held systems currently used to identify radioisotopes in cargo are characterized by wide variations in performance. These variations derive from the degree to which these systems rely on the judgment of the CBP Officer in adjudicating radiation alarms, the degree to which their performance depends on source-detector geometry and the ability to localize the source within the container, and the degree to which their performance can be degraded by operator inattention or fatigue.

The ASP could—if it performs in the field as intended, and if appropriate standard operating procedures are developed—substantially reduce these variations in performance and thus reduce some key uncertainties in the nation’s ability to counter the threat of nuclear smuggling.

Report Findings - Other

Many of the issues associated with the ASP test program are rooted in a larger set of issues having to do with the processes by which DHS manages large and/or complex acquisition programs. Accordingly, the IRT also offered a number of observations concerning the need for greater discipline in DHS acquisition management, requirements, and test and evaluation oversight.

Concluding Remarks

I am grateful for the opportunity to be of service and to help inform important decisions on homeland security issues such as nuclear smuggling. I will do my best to answer any questions you may have, and I will gladly make myself available to you and your staff for more detailed discussions if you wish. I respectfully request that my formal statement be submitted for the record. Thank you.