

GAO

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COMBATING NUCLEAR SMUGGLING

DHS's Decision to Procure and Deploy the Next Generation of Radiation Detection Equipment Is Not Supported by Its Cost- Benefit Analysis

Statement of Gene Aloise, Director
Natural Resources and Environment





Highlights of [GAO-07-581T](#), a testimony before the Subcommittee on Emerging Threats, Cybersecurity, and Science and Technology; Committee on Homeland Security; House of Representatives

Why GAO Did This Study

The Department of Homeland Security (DHS) is responsible for addressing the threat of nuclear smuggling. Radiation detection portal monitors are key elements in our national defenses against such threats. DHS has sponsored R&D and testing activities to develop a “next generation” portal monitor, known as the advanced spectroscopic portal monitor. However, each one costs 6 times more than a current portal monitor. In March 2006, we recommended that DHS conduct a cost-benefit analysis to determine whether the new portal monitors are worth the additional cost. In June 2006, DHS issued its analysis. In October 2006, we issued our report that assessed the DHS study.

GAO’s statement, based on our October 2006 report, addresses whether DHS’s cost-benefit analysis provides an adequate basis for its decision to purchase and deploy the next generation portal monitors.

What GAO Recommends

GAO’s October 2006 report included two recommendations designed to improve the quality and comprehensiveness of the Department’s analysis. DHS neither agreed nor disagreed with our recommendations, but continued to support its analysis as a solid basis for buying and deploying the new generation of radiation portal monitors.

www.gao.gov/cgi-bin/getrpt?GAO-07-581T.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Gene Aloise at (202) 512-3841 or aloise@gao.gov.

COMBATING NUCLEAR SMUGGLING

DHS's Decision to Procure and Deploy the Next Generation of Radiation Detection Equipment Is Not Supported by Its Cost-Benefit Analysis

What GAO Found

DHS’s cost-benefit analysis does not provide a sound analytical basis for its decision to purchase and deploy the new portal monitor technology. Our review of the analysis determined that it had the following problems:

Regarding the performance of the portal monitors:

- Instead of using the results of its own portal monitor tests conducted in 2005, DHS assumed that the new portal monitor technology would correctly detect and identify highly enriched uranium (HEU) 95 percent of the time—a performance level that far exceeds the new technology’s current capabilities.
- To determine the performance of the current generation of portal monitors in detecting HEU, DHS used data from limited tests carried out in 2004 that test officials concluded were unreliable for such purposes.
- DHS’s analysis of the new technology portal monitors was incomplete because the analysis focused on identifying HEU, but did not fully consider how well the new portal monitor technology could correctly detect or identify other dangerous radiological or nuclear materials.

Regarding cost estimates:

- In comparing the costs of the new and current technologies, the procurement costs of the current generation portal monitors were highly inflated because DHS assumed a unit cost of about \$131,000. However, the contract price at the time of the analysis was about \$55,000. According to officials who manage the contract, it was to expire and they expected portal monitor prices to increase, but not nearly as much as DHS assumed.
- DHS stated that the primary benefit of deploying the new portal monitors is reducing unnecessary secondary inspections. However, DHS’s analysis does not fully estimate today’s baseline costs for secondary inspections, which makes it impossible to determine whether the use of the new portal monitors as currently planned, will result in significant cost savings for these inspections.
- The new portal monitor contract price has exceeded DHS’s total cost estimate by about \$200 million. The cost-benefit analysis shows the total cost for deploying both current and new portal monitors to be about \$1 billion. However, in July 2006, DHS announced that it had awarded contracts to develop and purchase up to \$1.2 billion worth of the new portal monitors over 5 years.
- DHS’s cost-benefit analysis omitted many factors that could affect the cost of new portal monitors, such as understating the life-cycle costs for operating and maintaining the equipment over time.

For these reasons, DHS’s cost-benefit analysis does not meet the intent of our March 2006 report recommendation to fully assess the costs and benefits before purchasing any new equipment.

Mr. Chairman and Members of the Subcommittee:

I am pleased to appear here today to discuss our assessment of the Department of Homeland Security's (DHS) May 2006 cost-benefit analysis used to support the purchase and deployment of next generation radiation portal monitors.¹ This is an important decision because, if procured, these new portal monitors will be considerably more expensive than the portal monitors in use today. Combating nuclear smuggling is one of our nation's key national security objectives and the deployment of radiation detection equipment including portal monitors at U.S. ports of entry, including border crossings and domestic seaports, is an integral part of this system. DHS, through its Domestic Nuclear Detection Office (DNDO), is responsible for acquiring and supporting the deployment of radiation detection equipment, including portal monitors, within the United States. The Pacific Northwest National Laboratory (PNNL), one of the Department of Energy's (DOE) national laboratories, is under contract to manage the deployment of radiation detection equipment for DHS.² U.S. Customs and Border Protection (CBP) is responsible for screening cargo as it enters the nation at our borders, which includes operating radiation detection equipment to interdict dangerous nuclear and radiological materials.

The radiation portal monitors in use today can detect the presence of radiation, but they cannot distinguish between types of radiological material. For example, they cannot tell the difference between harmless products that emit radiation, such as ceramic tile, and dangerous materials, such as highly enriched uranium (HEU), that could be used to construct a nuclear weapon. Generally, CBP's standard procedures require incoming cargo to pass through one of these radiation portal monitors to screen for the presence of radiation. This "primary inspection" serves to alert CBP officers when a radioactive threat might be present. If there is a

¹GAO, *Combating Nuclear Smuggling: DHS's Cost-Benefit Analysis to Support the Purchase of New Radiation Detection Portal Monitors Was Not Based on Available Performance Data and Did Not Fully Evaluate All the Monitors' Costs and Benefits*, [GAO-07-133R](#) (Washington, D.C.: Oct. 17, 2006). GAO, *Combating Nuclear Smuggling: DHS Has Made Progress Deploying Radiation Detection Equipment at U.S. Ports of Entry, but Concerns Remain*, [GAO-06-389](#) (Washington, D.C.: Mar. 22, 2006).

²DOE manages the largest laboratory system of its kind in the world. The mission of DOE's 22 laboratories has evolved. Originally created to design and build atomic weapons, these laboratories have since expanded to conduct research in many disciplines – from high-energy physics to advanced computing.

potential threat, CBP procedures require a “secondary inspection.” To confirm the presence of radiation, this secondary inspection usually includes a second screening by a radiation portal monitor as well as a screening by CBP officers using radioactive isotope identification devices. These handheld devices are used to differentiate between types of radioactive material to determine if the radiation being detected is dangerous. Both the radiation portal monitors and handheld devices are limited in their abilities to detect and identify nuclear material.

DHS would like to improve the capabilities of its portal monitors so that they can perform the dual roles of detecting radiation and identifying radiological materials. In this regard, DHS has sponsored research, development, and testing activities designed to create the next generation of portal monitors capable of performing both functions. These new, advanced portals are known as advanced spectroscopic portals (ASPs). In July 2006, DHS awarded contracts to three vendors for developing the advanced spectroscopic portals’ capabilities. These awards were based mainly on performance tests conducted at DHS’s Nevada Test Site in 2005, where ten competing advanced spectroscopic vendors’ monitors were evaluated. At the same time, three current technology portal monitors were also tested.

To ensure that DHS’s substantial investment in radiation detection technology yields the greatest possible level of detection capability at the lowest possible cost, in a March 2006 GAO report,³ we recommended that once the costs and capabilities of ASPs were well understood, and before any of the new equipment was purchased for deployment, the Secretary of DHS work with the Director of DNDO to analyze the costs and benefits of deploying ASPs. Further, we recommended that this analysis focus on determining whether any additional detection capability provided by the ASPs was worth the considerable additional costs. In response to our recommendation, DNDO issued its cost-benefit analysis in May 2006, and an updated, revised version in June 2006. According to senior agency officials, DNDO believes that the basic conclusions of its cost-benefit analysis show that the new advanced spectroscopic portal monitors are a sound investment for the U.S. government.

³GAO, *Combating Nuclear Smuggling: DHS Has Made Progress Deploying Radiation Detection Equipment at U.S. Ports of Entry, but Concerns Remain*, [GAO-06-389](#) (Washington, D.C.: Mar. 22, 2006).

Mr. Chairman, my remarks today focus on the cost-benefit analysis DNDO used in support of its decision to purchase new ASP portal monitors. Specifically, I will discuss whether DNDO's June 2006 cost-benefit analysis provides an adequate basis for the substantial investment that acquiring and deploying ASPs will necessitate.

My testimony is based upon our October 2006 report that evaluated DNDO's cost-benefit analysis.⁴ The work for our report was done in accordance with generally accepted government auditing standards.

In summary, DNDO's 2006 cost-benefit analysis does not provide a sound analytical basis for its decision to purchase and deploy the new advanced spectroscopic portal monitor technology.

Regarding the performance of the portal monitors:

- Instead of using the results of its performance tests conducted in 2005, DNDO's analysis simply assumed that ASPs could detect highly enriched uranium 95 percent of the time, a performance level far exceeding the capabilities of the new technology's current demonstrated capabilities. The 2005 test results showed that the best of the three winning vendor monitors could only identify masked HEU⁵ about 50 percent of the time.
- To determine the current generation of portal monitors' performance in detecting HEU, DNDO used data from limited tests carried out in 2004 that test officials concluded was unreliable for such purposes. In their written report, test officials explicitly stated that the data were not indicative of how well current technology portal monitors might perform in the field particularly for detecting HEU.
- DNDO's analysis of the new technology portal monitors' performance was deficient because it focused on detecting and identifying HEU, but did not fully consider other dangerous radiological or nuclear materials. DNDO should have assessed the ASPs' abilities to detect several realistic threat materials.

⁴GAO, *Combating Nuclear Smuggling: DHS's Cost-Benefit Analysis to Support the Purchase of New Radiation Detection Portal Monitors Was Not Based on Available Performance Data and Did Not Fully Evaluate All the Monitors' Costs and Benefits*, [GAO-07-133R](#) (Washington, D.C.: Oct. 17, 2006).

⁵"Masking" is an attempt to hide dangerous nuclear or radiological material by placing it with benign radiological sources.

Regarding cost estimates:

- In comparing the costs of the new and current technologies, the procurement costs of the current generation portal monitors were highly inflated because DNDO assumed a unit cost of about \$131,000, while the contract price at the time of the analysis was about \$55,000. According to officials who manage the contract, it was to expire and while they expected portal monitor prices to increase, they did not believe the cost would be as much as the price used in DNDO's analysis.
- DNDO stated that the primary benefit of deploying the new portal monitors is reducing unnecessary secondary inspections. However, DNDO's analysis did not fully estimate today's baseline costs for secondary inspections, which makes it impossible to determine whether the use of the new portal monitors as currently planned will result in significant cost savings for these inspections.
- The new portal monitor contract price has exceeded DNDO's total cost estimate by about \$200 million. The cost-benefit analysis shows the total cost for deploying both current and new portal monitors to be about \$1 billion. However, in July 2006, DHS announced that it had awarded contracts to develop and purchase up to \$1.2 billion worth of the new portal monitors over 5 years.
- DNDO's cost-benefit analysis omitted many factors that could affect the cost of new portal monitors, such as understating the life-cycle costs for operating and maintaining the equipment over time.

Background

In general, DHS is responsible for providing radiation detection capabilities at U.S. ports of entry. Until April 2005, CBP managed this program. However, on April 15, 2005, the President directed the establishment of DNDO within DHS. DNDO's duties include acquiring and supporting the deployment of radiation detection equipment, including portal monitors. CBP continues its traditional screening function at ports of entry to interdict dangerous nuclear and radiological materials through the use of radiation detection equipment. The SAFE Port Act of 2006 formally authorizes DNDO's creation and operation.⁶ PNNL manages the deployment of radiation detection equipment for DHS.

⁶Pub. L. No. 109-347, tit. V, 120 Stat. 1884, 1932 (2006).

DHS's program to deploy radiation detection equipment at U.S. ports of entry has two goals. The first is to use this equipment to screen all cargo, vehicles, and individuals coming into the United States. The second is to screen this traffic without delaying its movement into the nation. DHS's current plans call for completing the deployment of radiation portal monitors at U.S. ports of entry by September 2013. The current technology portal monitors, known as plastic scintillators or PVTs, cost about \$55,000 per unit, while the advanced spectroscopic portal monitors, known as ASPs, will cost around \$377,000 per unit.⁷

In July 2006, DHS announced that it had awarded contracts to three ASP vendors to further develop and purchase \$1.2 billion worth of ASPs over 5 years. Congress, however, provided that none of DND's appropriated funds for systems acquisition could be obligated for full procurement of ASPs until the Secretary of DHS certifies through a report to the Committees on Appropriations for the Senate and House of Representatives that ASPs would result in a significant increase in operational effectiveness.⁸

⁷Prices include only equipment purchase. Installation costs are extra.

⁸Department of Homeland Security Appropriations Act for Fiscal Year 2007, Pub. L. No. 109-295, tit. IV, 120 Stat. 1355, 1376 (2006).

DNDO Ignored Its Own Performance Test Results and Instead Relied on the Potential Performance of New Portal Monitors and Unreliable Estimates of Current Equipment Performance

DHS is developing new portal monitors, known as ASPs that, in addition to detecting nuclear or radiological material, can also identify the type of material. In 2005, DNDO conducted side-by-side testing at the Nevada Test Site (NTS)⁹ on 10 ASP systems and 3 PVT systems developed by private sector companies, including the PVT systems currently deployed. DHS requested that the National Institutes of Standards and Technology (NIST) provide assistance by conducting an independent analysis of data acquired during the last phase of developmental testing of ASPs to help DHS determine the performance of ASP portal monitors being proposed by private sector companies. NIST compared the 10 ASP systems, and in June 2006 submitted a report to DHS on the results of that testing.¹⁰

Performance tests of ASPs showed that they did not meet DNDO's main performance assumption in the cost-benefit analysis of correctly identifying HEU 95 percent of the time it passes through portal monitors. The 95 percent performance assumption included ASPs' ability to both detect bare, or unmasked, HEU in a container and HEU masked in a container with a more benign radiological material.¹¹ Based on NIST's assessment of the performance data, the ASP prototypes (manufactured by the three companies that won DNDO's recent ASP procurement contract) tested at NTS identified bare HEU only 70 to 88 percent of time. Performance tests also showed that ASPs' ability to identify masked HEU fell far short of meeting the 95 percent goal established for the cost-benefit analysis. According to DNDO, identifying masked HEU is the most difficult case to address. DOE officials told us that benign radiological materials could be used to hide the presence of HEU. NIST reported that the best ASP prototype DNDO tested in Nevada during 2005, and which won a procurement contract, was able to correctly identify masked HEU and depleted uranium (DU) only 53 percent of the time. Similarly, the ASP prototypes submitted by the other two companies that won DNDO ASP procurement contracts were able to identify masked HEU and DU only 45 percent and 17 percent of the time.

⁹DHS and DOE are collaborating in building a new Radiological and Nuclear Countermeasures Test and Evaluation Complex at the Nevada Test Site to support the development, testing, acquisition, and deployment of radiation detection equipment. The facility is expected to become fully operational in early 2007. Currently, an interim facility at NTS is being used to test radiation detection equipment.

¹⁰NIST did not evaluate the PVTs or compare their performance to the performance of the ASPs.

¹¹The ability to detect masked HEU is based on DOE guidance on performing the evaluation.

Despite these results, DNDO did not use the information from these tests in its cost-benefit analysis. Instead, DNDO officials told us that since the new portal monitors cannot meet the 95 percent detection goal, they relied on the assumption that they will reach that level of performance sometime in the future. DNDO officials asserted that the ASPs' current performance levels would improve, but they provided no additional information as to how the 95 percent goal will be achieved or an estimate of when the technology would attain this level of performance.

Moreover, DNDO's cost-benefit analysis only considered the benefits of ASPs' ability to detect and identify HEU and did not consider the ASPs' ability to detect and identify other nuclear and radiological materials. The ability of an ASP to identify specific nuclear or radiological materials depends on whether the ASP contains software that is specific to those materials. In our view, a complete cost-benefit analysis would include an assessment of ASPs' ability to detect and identify a variety of nuclear and radiological material, not just HEU. By excluding radiological and nuclear materials other than HEU, DNDO's analysis did not consider the number of secondary inspections that would be related to these materials and hence it likely underestimated the costs of ASP use. Further, DNDO told us the assumptions for the ability of ASP systems to detect and identify HEU 95 percent of the time came from the ASP performance specifications. However, we examined the performance specifications and found no specific requirement for detecting or identifying HEU with a 95 percent probability.¹² While there is a requirement in the performance specification for the identification for HEU and other special nuclear material, we found no associated probability of success in performing this function.

DNDO's cost-benefit analysis also may not accurately reflect the capabilities of PVTs to detect nuclear or radiological material. DNDO officials acknowledged that DNDO tested the performance of PVTs along with the ASPs in 2005, but did not use the results of these tests in its cost-benefit analysis. According to these officials and NIST staff who assisted in the testing, the PVT performance data were unusable because the PVTs' background settings were not set properly. Consequently, DNDO officials

¹²The performance specifications contain a requirement for detecting, not identifying, californium-252 with a 95 percent probability. Californium-252 has similar radiological properties to HEU. In addition, the performance specifications contain a requirement for detecting, but not identifying, other radiological materials such as cobalt-57, cobalt-60, barium-133, cesium-137, and americium-241.

told us the analysis was based on the performance of PVT monitors that PNNL tested during 2004 in New York. However, the results from these field tests are not definitive because, as PNNL noted in its final report, the tests did not use HEU and, therefore, the results from the tests did not indicate how well PVT portal monitors would be able to detect HEU in the field.¹³ Moreover, the PVT portal monitors that PNNL used had only one radiation detection panel as opposed to the four-panel PVT monitors that DHS currently deploys at U.S. ports of entry. An expert at a national laboratory told us that larger surface areas are more likely to detect radiological or nuclear material. DNDO also stated that due to the nature of the testing at the Nevada Test Site, the tests did not provide the data needed for the cost-benefit analysis. According to DNDO officials, this data would come from analysis of the performance of fielded systems at U.S. ports-of-entry where the probability to detect threats could be compared to false alarm rates.

DNDO's director stated twice in testimony before the House Homeland Security Committee, Subcommittee on Prevention of Nuclear and Biological Attack—once on June 21, 2005, and again on May 26, 2006—that the ASP and PVT portals would be evaluated against one another in “extensive high-fidelity” tests. In our view, the results of such testing are critical to any decision by DNDO to employ new technology, such as ASPs, that might help protect the nation from nuclear smuggling. According to DNDO officials, new tests now underway at the DHS Nevada Test Site are comparing the performance of ASPs and PVTs side-by-side.

¹³Pacific Northwest National Laboratory, *A Sensitivity Comparison of NaI and PVT Portal Monitors at a Land-Border Port-of-Entry*, p. iii, November 2004. For Official Use Only.

DNDO's Cost-Benefit Analysis was Incomplete and Used Inflated Cost Estimates for PVT Equipment

DNDO officials told us they did not follow the DHS guidelines for performing cost-benefit analyses in conducting their own cost-benefit analysis.¹⁴ These guidelines stipulate, among other things, that such studies should address all of the major costs and benefits that could have a material effect on DHS programs. However, DNDO's analysis omitted many factors that could affect the cost of new radiation portal monitors. For example, DNDO officials told us that there are over 12 different types of ASP monitors, yet they only estimated the cost of cargo portal monitors that would be used at land border crossings. In reality, DNDO and CBP plan to deploy different types of ASPs that would have varying costs, such as portal monitors at seaports which would have higher costs. Additionally, DNDO did not capture all the costs related to developing the different types of ASP monitors. In our view, developing realistic cost estimates should not be sacrificed in favor of simplicity.

DNDO also underestimated the life-cycle costs for operations and maintenance for both PVT and ASP equipment over time. DNDO's analysis assumed a 5-year life-cycle for both PVT and ASP equipment. However, DNDO officials told us that a 10-year life-cycle was a more reasonable expectation for PVT and ASP equipment. The analysis assumes that the annual maintenance costs for PVT and ASP monitors will each equal 10 percent of their respective procurement costs. This means that maintenance costs for PVTs would be about \$5,500 per year per unit based on a \$55,000 purchase price and ASP maintenance costs would be about \$38,000 per year per unit based on a \$377,000 purchase price. Given the much higher maintenance costs for ASPs and the doubling of the life-cycle to 10 years, the long-term implications for these cost differences would be magnified. Consequently, DNDO's analysis has not accounted for about \$181 million in potential maintenance costs for ASPs alone.

Furthermore, DNDO did not assess the likelihood that radiation detection equipment would either misidentify or fail to detect nuclear and radiological materials. Rather, DNDO's cost-benefit analysis focuses on the ability of ASPs to reduce false alarms—alarms that indicate nuclear or radiological material is in a container when, in fact, the material is actually non-threatening, such as ceramic tile. Reducing false alarms would reduce the number of secondary inspections of non-threatening nuclear and

¹⁴DHS, Capital Planning and Investment Control, *Cost-Benefit Analysis (CBA) Guidebook 2006, Version 2.0*, February 2006. Traditional rules of performing cost-benefit analyses include assessing the full life-cycle costs for operation and maintenance, and determining the level of confidence in cost data.

radiological materials and therefore the costs of those inspections. However, as required by DHS's guide to performing cost-benefit analyses, DNDO's analysis did not include all costs. In particular, the analysis did not include the potentially much bigger cost of "false negatives." False negatives are instances in which a container possesses a threatening nuclear or radiological material, but the portal monitor either misidentifies the material as non-threatening or does not detect the material at all, thus allowing the material to enter the country. During the 2005 Nevada tests, the incidence of false negatives among the three vendors who received contracts ranged from about 45 percent to slightly more than 80 percent. This raises concerns because, as explained to us by a scientist at a national laboratory, at this level of performance, ASPs could conceivably misidentify HEU as a benign nuclear or radiological material or not detect it at all, particularly if the HEU is placed side by side with a non-threatening material such as kitty litter.

In recent testimonies before Congress, DNDO's Director has cited the primary benefit of deploying ASP monitors as reducing unnecessary secondary inspections.¹⁵ DNDO's cost-benefit analysis focused on measuring the benefits of ASP's ability to reduce false alarms—alarms that indicate nuclear or radiological material is present when, in fact, it is not or such material is actually non-threatening. Reducing false alarms would reduce the number of secondary inspections of non-threatening nuclear and radiological materials and therefore the costs of those inspections. Even on this point, however, DNDO's analysis was flawed. For example, it did not estimate the costs of secondary inspections as they are carried out today. DNDO's analysis needs these baseline costs to compare alternatives because without them, it is impossible to determine whether the use of ASPs, as planned, will result in cost savings for secondary inspections. While we agree that facilitating commerce at U.S. ports of entry by reducing unnecessary secondary inspections is an important goal, we believe that the primary rationale for deploying portal monitors should be to protect the nation from nuclear and/or radiological attack. We found that DNDO's analysis did not even attempt to measure the level—or value—of security afforded by portal monitors.

¹⁵*Enlisting Foreign Cooperation in U.S. Efforts to Prevent Nuclear Smuggling: Hearing Before the House Committee on Homeland Security, Subcommittee on Prevention of Nuclear and Biological Attack*, 109th Cong. (May 25, 2006)(statement of Mr. Vayl S. Oxford, Director, DNDO); *Detecting Smuggled Nuclear Weapons, Hearing Before the Senate Judiciary Committee, Subcommittee on Terrorism, Technology, and Homeland Security*, 109th Cong. (July 27, 2006)(statement of Mr. Vayl S. Oxford, Director, DNDO).

In addition, the ASP contract award has exceeded DNDO's estimate for total cost by about \$200 million. The cost-benefit analysis shows the total cost for deploying PVT and ASP monitors to be about \$1 billion, which covers all costs related to acquisition, design, maintenance, and physical inspection over 5 years (for both PVT and ASP). However, in July 2006, DHS announced that it had awarded contracts to develop and purchase up to \$1.2 billion worth of ASP portal monitors over 5 years. Furthermore, the cost-benefit analysis underestimates total deployment costs and does not account for other major costs, such as physical inspections of cargo containers, an additional procurement of 442 new PVT monitors, installation and integration, and maintenance.

Finally, DNDO overstated the purchase price of PVT monitors. Although DHS is currently paying an average of about \$55,000 per monitor, DNDO's cost-benefit analysis assumed the PVT would cost \$130,959—the highest published manufacturers' price for the government.¹⁶ According to DNDO's Director, DNDO chose the highest published price because the current contract for portal monitors at that time was to expire, and the portal monitors will probably cost more in the future. However, the information DNDO provided us does not explain why DNDO assumes that the future price will be more than double what DHS was currently paying, as assumed in DNDO's analysis. PNNL officials told us that the future price will almost certainly be lower than the price used in DNDO's analysis.

In conclusion, DNDO's approach to the cost-benefit analysis omitted many factors that could affect the cost of new radiation portal monitors. For these reasons, DHS's cost-benefit analysis does not meet the intent of our March 2006 report recommendation to fully assess the costs and benefits before purchasing any new equipment.

Mr. Chairman, this concludes my prepared statement. I would be happy to respond to any questions that you or other members of the Subcommittee may have.

¹⁶DNDO, *Cost Benefit Analysis for Next Generation Passive Radiation Detection of Cargo at the Nation's Border Crossings*, May 30, 2006.

**GAO Contact and
Staff
Acknowledgements**

For further information about this testimony, please contact me, Gene Aloise, at (202) 512-3841 or at aloisee@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this statement. John Delicath, Jim Shafer, and Eugene Wisnoski made key contributions to this statement.

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