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# NUCLEAR NONPROLIFERATION

# U.S. Efforts to Help Other Countries Combat Nuclear Smuggling Need Strengthened Coordination and Planning

G A O

Accountability * Integrity * Reliability

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**United States General Accounting Office**
**Washington, DC 20548**

May 16, 2002

The Honorable Pat Roberts
Ranking Minority Member,
Subcommittee on Emerging Threats
and Capabilities
Committee on Armed Services
United States Senate

Dear Senator Roberts:

Illicit trafficking in or smuggling of nuclear and other radioactive materials occurs worldwide and has reportedly increased in recent years. According to the International Atomic Energy Agency[1] (IAEA), as of December 31, 2001, there had been 181 confirmed cases of illicit trafficking of nuclear material since 1993. (See app. I for more information about nuclear smuggling cases.) A significant number of the cases reported by IAEA involved material that could be used to produce a nuclear weapon or a device that uses conventional explosives with radioactive material ("dirty bomb") to spread radioactive contamination over a wide area. Nuclear material can be smuggled across a country's border through a variety of means: it can be hidden in a car, train, or ship, carried in personal luggage through an airport, or walked across an unprotected border.

Many nuclear smuggling cases have been traced to nuclear material that originated in the countries of the former Soviet Union. The United States, through the Department of Energy's Material Protection, Control, and Accounting (MPC&A) program,[2] has helped these countries secure nuclear material at civilian and defense facilities—this effort is considered the first line of defense against potential theft and/or diversion of nuclear

[1]IAEA is affiliated with the United Nations and has 133 member states, including the United States. Its objectives are to promote the peaceful use of nuclear energy and to verify that nuclear material under its supervision or control is not used to further any military purpose.

[2]This review will only focus on U.S. assistance to combat nuclear smuggling at countries' borders. We recently reported on the Department of Energy's MPC&A program and found that the program is reducing the risk of theft of nuclear material but hundreds of metric tons of nuclear material still lack improved security systems and are vulnerable to theft. See *Nuclear Nonproliferation: Security of Russia's Nuclear Material Improving; Further Enhancements Needed* (GAO-01-312, Feb. 28, 2001).

materials. To address the threat posed by nuclear smuggling, the United States is helping these countries improve their border security—a second line of defense—but these assistance efforts face daunting challenges.[3] For example, Russia alone has almost 12,500 miles of borders with 14 countries, including North Korea. It is also in close geographical proximity to Afghanistan, Iran, and Iraq.

As agreed with your office, this report addresses U.S. efforts to combat nuclear smuggling by (1) identifying the U.S. federal programs tasked with combating the threat of illicit trafficking in nuclear materials and the amount of U.S. funding spent on this effort; (2) determining how well the U.S. assistance is coordinated among federal agencies; and (3) assessing the effectiveness of the equipment and training provided by the United States. We visited four countries to obtain a first hand look at U.S. radiation detection equipment installed at different border crossings and meet with officials responsible for border security, law enforcement, and export controls.

## Results in Brief

U.S. assistance efforts to combat nuclear smuggling are divided among six federal agencies—the Departments of Energy, State, and Defense; the U.S. Customs Service; the Federal Bureau of Investigation (FBI); and the U.S. Coast Guard. From fiscal year 1992 through fiscal year 2001, the six agencies spent about $86 million to help about 30 countries, mostly in the former Soviet Union and Central and Eastern Europe, combat the threat of smuggling of nuclear and other materials that could be used in weapons of mass destruction. The agencies have provided a range of assistance, including radiation detection equipment and training, technical exchanges to promote the development and enforcement of laws and regulations governing the export of nuclear-related equipment and technology, and other equipment and training to generally improve countries' ability to interdict nuclear smuggling. The Department of Energy (DOE) has two programs to combat nuclear smuggling and primarily focuses on Russia. Energy has installed radiation detection monitors at eight border crossings, including at an airport in Moscow, and plans to install similar equipment at close to 60 sites in Russia. The State Department has provided radiation detection monitors, mobile vans equipped with

[3] While some of the assistance specifically targets nuclear smuggling, a portion of the assistance is intended to improve countries' ability to interdict any weapons smuggling—nuclear, chemical, biological, and conventional.

radiation detectors, handheld radiation detectors, and other assistance to about 30 countries through two separate programs. The Department of Defense (DOD) has two programs that have provided radiation detection monitors, handheld detectors, and other assistance to about 20 countries. With funding provided by the Departments of State and Defense, the U.S. Customs Service, the Federal Bureau of Investigation, and the U.S. Coast Guard have provided a variety of training and equipment to customs, border guard, and law enforcement officials in numerous countries.

U.S. assistance is not effectively coordinated and lacks an overall governmentwide plan to guide it. Although an interagency group, chaired by the State Department, exists to coordinate U.S. assistance efforts, the six agencies that are providing assistance do not always coordinate their efforts through this group. As a result, the Departments of Energy, State, and Defense have pursued separate approaches to installing radiation detection equipment at other countries' border crossings; consequently, some countries' border crossings are more vulnerable to nuclear smuggling than others. Specifically, the Department of Energy is installing equipment at border sites in Russia and the Department of Defense is installing equipment in another country that is better able to detect weapons-usable nuclear material, while the State Department has installed less sophisticated radiation detection monitors in other countries. Coordination problems also exist within agencies. For example, the Department of Energy's Second Line of Defense program does not coordinate its efforts with another office within the Department that also provides radiation detection equipment because that office receives funding from and installs equipment on behalf of the State Department. Officials of the Departments of State, Energy, and Defense have acknowledged that U.S. assistance efforts lack adequate planning and need better coordination among all the agencies. In addition, these officials told us that the roles and responsibilities of each agency in the overall U.S. assistance effort should be better clarified. This report makes recommendations to improve the planning and coordination of U.S. assistance to combat nuclear smuggling.

While U.S. assistance is generally helping countries combat the smuggling of nuclear and other radioactive materials, serious problems with installing, using, and maintaining radiation detection equipment have undermined U.S. efforts. Representatives of 17 recipient countries told us that U.S. assistance has provided needed radiation detection equipment at border sites and training for border security guards and other law enforcement personnel. Without U.S. assistance, some countries would not have any radiation detection equipment at their borders or training in

how to inspect vehicles, luggage, and people and investigate nuclear smuggling cases. In other countries, U.S. assistance has bolstered existing nuclear smuggling detection programs. We observed at border sites in countries we visited that U.S.-provided equipment was working and was being used for the purposes intended. However, we also found serious problems with some of the equipment provided to various countries. For example, about one-half of the stationary radiation detection monitors funded by the Department of Defense to one country in the former Soviet Union was never installed; numerous portable radiation detectors could not be accounted for; and radiation detection equipment provided by the State Department to Lithuania was stored in the basement of the U.S. embassy for about 2 years because of a disagreement between the department and the recipient country about the need for a power supply line costing $12,600. These and other problems are largely a result of the lack of oversight and follow-up by the agencies providing the assistance. U.S. officials are attempting to correct some of these problems by, among other things, stationing advisors in countries receiving U.S. assistance. Another problem affecting U.S. assistance efforts is that recipient countries do not systematically report incidents of nuclear material detected at their borders, which limits the ability of U.S. agencies to measure the effectiveness of the equipment they are providing. This report makes several recommendations designed to improve management of U.S.-provided radiation detection equipment and to secure recipient country assurances that information about detected nuclear materials is shared in a timely basis.

We provided draft copies of this report to the Departments of State, Energy, and Defense; the U.S. Customs Service; the U.S. Coast Guard; and the Federal Bureau of Investigation for their review and comment. The Coast Guard and FBI had no comments on the draft report. DOD provided technical comments, which we incorporated in the report as appropriate. The agencies agreed with the facts presented in the report and State specifically said that it agreed with the report's conclusions and recommendations. Customs suggested that we reword our recommendation to specifically include it as one of the agencies to develop a governmentwide plan to combat nuclear smuggling, which we did. DOE did not comment on the conclusions and recommendations.

## Background

Over the past decade, the United States has paid increased attention to the threat that unsecured weapons-usable nuclear material in the countries of the former Soviet Union, particularly Russia, could be stolen and fall into the hands of terrorists or countries seeking weapons of mass destruction.

By some estimates, the former Soviet Union had about 30,000 nuclear weapons and over 600 metric tons of weapons-usable material when it collapsed about 10 years ago. Several cases of illicit trafficking in nuclear material in Germany and the Czech Republic in the early to mid-1990s underscored the proliferation threat. The United States responded to the threat by providing assistance to increase security at numerous nuclear facilities in the former Soviet Union, particularly in Russia, in order to prevent weapons-usable nuclear material from being stolen. In addition, the United States has provided portal monitors (stationary equipment designed to detect radioactive materials carried by pedestrians or vehicles) and smaller, portable radiation detectors at border crossings in many countries of the former Soviet Union and Central and Eastern Europe. The equipment, which is installed at car and truck crossings, railroad crossings, seaports, and airports, can serve two purposes: deterring smugglers from trafficking in nuclear material and detecting cases of actual nuclear smuggling.

Radiation detection equipment can detect radioactive materials used in medicine and industry, patients who have recently had radiological treatment, commodities that are sources of naturally occurring radiation such as fertilizer, and—of primary concern in terms of nonproliferation—nuclear material that could be used in a nuclear weapon. Nuclear material includes radioactive source materials--such as natural uranium, low enriched uranium used as fuel in commercial nuclear power reactors, and plutonium and highly enriched uranium--that are key components of nuclear weapons. The capability of the equipment to detect nuclear material depends on a number of factors including the amount of material, the size of the detection device, and whether the material is shielded from detection. For example, a small amount of material shielded by a lead container would likely escape detection while a large amount of material with no shielding would be more likely to cause an alarm. Detecting actual cases of illicit trafficking in weapons-usable nuclear material is complicated because one of the materials that is of greatest concern in terms of proliferation—highly enriched uranium—is among the most difficult materials to detect due to its relatively low level of radioactivity. In contrast, medical and industrial radioactive sources, which could be used in a radiological dispersion device or "dirty bomb," are highly radioactive and therefore easier to detect. Because of the complexity of detecting nuclear material, the customs officers or border guards who are responsible for operating the equipment must also be trained in how to use handheld radiation detectors to pinpoint the source of an alarm, identify false alarms, and respond to cases of illicit nuclear smuggling.

## U.S. Government Has Spent about $86 Million to Help Countries Combat Nuclear Smuggling

From fiscal year 1992 through 2001, six federal agencies received $140 million and spent $86.1 million to combat the threat of nuclear smuggling in about 30 countries, including all of the countries of the former Soviet Union and numerous countries in Central and Eastern Europe. The Departments of State and Defense provide funding to four other agencies, and some agencies have carried over millions of dollars in program funds into fiscal year 2002 because they have received more funding than they have been able to spend.

### U.S. Assistance Is Divided Among Six Federal Agencies

The Departments of Energy, State, and Defense; the U.S. Customs Service; the Federal Bureau of Investigation; and the U.S. Coast Guard have provided assistance to about 30 countries' customs, border, and law enforcement agencies to detect, interdict, and investigate nuclear smuggling. Radiation detection equipment is one of the many types of assistance that the U.S. agencies are providing. Other equipment ranges from simple hand tools for taking apart and searching different compartments of a vehicle for hidden contraband to boats and vehicles for conducting patrols. Similarly, training ranges from hands-on instruction in using the equipment and conducting searches to high-level technical exchanges on establishing the legal and regulatory basis for preventing illicit trafficking and trade in sensitive goods and materials that could be used in a nuclear weapon. U.S. assistance began in the mid-1990s under DOD's Cooperative Threat Reduction program and then expanded to State, DOE, and other DOD programs.

While DOE, DOD, and State receive their own funding for their assistance programs, Customs, the FBI, and the Coast Guard receive their funding from State and/or DOD. DOE also receives part of its funding from State.

### Departments of Energy, State, and Defense Have the Primary Role in Delivering U.S. Assistance

DOE has two programs that have provided assistance to combat nuclear material smuggling—the Second Line of Defense program and the International Export Control Program (IECP). The Second Line of Defense Program focuses on providing radiation detection equipment to Russia. From fiscal year 1997 through 2001, DOE spent $11.2 million, including $2.7 million provided by the State Department, to install 70 portal monitors at eight sites in Russia, including a Moscow airport. DOE has identified close to 60 sites in Russia where it plans to install portal monitors over the next decade at a total cost of about $50 million and has begun work at 19 of these sites. In addition, DOE may expand the program beyond Russia to include other countries of the former Soviet Union. DOE's International Export Control Program spent $22 million, including

$2.4 million provided by State, from fiscal year 1992 through 2001 to help countries of the former Soviet Union control the export of goods and technologies that could be used in the development of nuclear weapons. Whereas the Second Line of Defense program focuses on the nuclear material needed to manufacture a nuclear bomb, the IECP focuses on the other high-technology components needed for a bomb such as equipment for enriching uranium. The program provides assistance to prevent legitimate enterprises, such as businesses that were affiliated with the Soviet Union's nuclear weapons complex, from intentionally or unintentionally engaging in illicit trade in such goods and technologies. DOE also spent $1.8 million to support State and DOD programs to combat nuclear smuggling.

The State Department has received the largest amount of funding through the end of fiscal year 2001 for assistance to combat nuclear smuggling in about 30 countries, mostly in the former Soviet Union and Central and Eastern Europe. State spent $11.4 million primarily through two programs—the Nonproliferation and Disarmament Fund and the Export Control and Related Border Security Assistance program. Through the Nonproliferation and Disarmament Fund, State spent $8.5 million from fiscal year 1994 through 2001 to, among other things, install portal monitors in countries other than Russia. In addition, State provided handheld radiation detectors, dosimeters (to measure levels of radiation), and mobile vans equipped with x-ray machines and radiation detectors that can be driven among a number of border crossings. From fiscal year 1998 through 2001, State's Export Control and Related Border Security Assistance program spent $2.7 million to, among other things, purchase three vans equipped with radiation detectors for Russia and another van for Poland. State's Georgia Border Security and Law Enforcement program (implemented by Customs) also spent $0.2 million to provide radiation detection equipment as part of its assistance to strengthen Georgia's overall border infrastructure and security against any type of crime, including nuclear material smuggling. State also provided $58.8 million to DOE, Customs, and the Coast Guard to fund their assistance activities.

DOD has provided assistance to combat nuclear smuggling under two programs—the Cooperative Threat Reduction program and the International Counterproliferation program. From fiscal year 1993 to 2001, the Cooperative Threat Reduction program spent $16.3 million to assist five countries. The assistance included $1 million for radiation detection equipment—36 pedestrian portal monitors (to screen people) and 100 handheld radiation detectors for one country and an additional 100

handheld detectors for another country—and about $10 million for other equipment to enable the countries to better patrol their borders, conduct searches for smuggled contraband, and equip their border posts. In addition, as part of the Cooperative Threat Reduction program, in fiscal year 2001 DOD began to work with DOE's Lawrence Livermore National Laboratory to install seven portal monitors at three border crossings in another country. DOD has begun site surveys at about eight additional border crossings in that country where it plans to install portal monitors. As part of the International Counterproliferation program, DOD spent $10.2 million from fiscal year 1997 through 2001 to provide Customs and FBI training and equipment to 17 countries of the former Soviet Union and Central and Eastern Europe.

## U.S. Customs Service, Federal Bureau of Investigation, and U.S. Coast Guard Implement Assistance with Funding from the Departments of State and Defense

The U.S. Customs Service, the largest recipient of funding provided by State and DOD, spent $11.1 million from fiscal year 1993 through 2001 on assistance to combat nuclear smuggling. Customs has provided training and equipment to customs agencies and border guards in close to 30 countries. The equipment includes radiation pagers (small detectors that can be worn on a belt to continuously monitor radiation levels or used as a handheld device to pinpoint the location of radioactive material detected by a portal monitor) as well as a variety of other high- and low-tech tools to conduct searches and detect sensitive goods and materials, such as fiber optic scopes for examining fuel tanks for contraband. Training includes assistance in operating the x-ray vans equipped with radiation detectors; providing hands-on instruction in using equipment to detect nuclear smuggling; teaching techniques for investigating smuggling operations; tracking the movements of smugglers between ports of entry, including through rough terrain; and providing "train-the-trainer" courses to enable countries to train more personnel than the U.S. assistance can reach. In addition to equipment and training, Customs has stationed 22 in-country advisors covering 25 countries on behalf of State to help implement and coordinate the assistance.

From fiscal year 1997 through 2001, the FBI spent $0.4 million as part of the DOD International Counterproliferation program. The DOD/FBI effort trained and equipped law enforcement agencies to investigate and respond to actual seizures of smuggled nuclear or other material. Training included seminars for high-level officials and courses on conducting investigations and managing a crime scene where a seizure has taken place. Equipment provided as part of the training included protective equipment, such as HAZMAT suits to make handling of seized material safer; evidence collection and sampling kits; and chemical detection equipment. In

addition, the FBI recently expanded the equipment list to include radiation pagers.

From fiscal year 1999 through 2001, the U.S. Coast Guard spent $1.6 million in funding received from the State Department Export Control and Related Border Security Assistance program. The Coast Guard has provided assistance for maritime interdiction of nuclear smuggling to countries of the former Soviet Union. Assistance provided to one country includes two boats with spare parts and stationing of an in-country Coast Guard advisor.

Table 1 lists each program and activity, expenditures through fiscal year 2001, and the general nature of the assistance provided. For additional details about each of the six agencies' programs and expenditures, see appendix II.

**Table 1: Assistance to Combat Nuclear Smuggling and Expenditures through Fiscal Year 2001**

Dollars in millions

| Programs/activities | Program/activity description | Expenditures | Funding source |
|---|---|---|---|
| DOE Second Line of Defense | Install radiation detection portal monitors at Russian border crossings. | $11.2 | Includes $8.5 million in DOE funds and $2.7 million from State |
| DOE International Export Control Program | Provide nuclear-specific export control assistance to countries of the former Soviet Union. | 22.0 | Includes $19.6 million in DOE funds and $2.4 million from State |
| DOE | Install radiation detection equipment in countries of the former Soviet Union (other than Russia) and Central and Eastern Europe. | 1.8 | Includes $0.5 million from State and $1.3 million from DOD |
| State Dept. Nonproliferation & Disarmament Fund | Provide radiation detection equipment and other assistance for interdicting nuclear smuggling to the former Soviet Union and Central and Eastern Europe. | 8.5 | |
| State Dept. Export Control & Related Border Security Assistance | Provide radiation detection equipment and other assistance for interdicting nuclear smuggling to the former Soviet Union and Central and Eastern Europe. (Took over Nonproliferation and Disarmament Fund radiation detection assistance beginning in FY 2002.) | 2.7 | |
| State Dept. Georgia Border Security & Law Enforcement | Provide wide range of assistance to Georgia border guards and customs service to interdict nuclear smuggling, fight other crimes such as drug smuggling, and develop border infrastructure. | 0.2 | |
| DOD Cooperative Threat Reduction | Provide radiation detection equipment and other assistance for interdicting nuclear smuggling to 5 countries, and install radiation detection portal monitors in one country. | 16.3 | |
| DOD International Counterproliferation program | Train and equip customs officers, border guards, and law enforcement officials to detect, interdict, and respond to nuclear smuggling. | 10.2 | |

| Dollars in millions | | | |
|---|---|---|---|
| **Programs/activities** | **Program/activity description** | **Expenditures** | **Funding source** |
| U.S. Customs Service | Train and equip customs officers and border guards in the former Soviet Union and Central and Eastern Europe to detect and interdict nuclear smuggling. | 11.1 | Includes $8.8 million from State and $2.3 million from DOD |
| Federal Bureau of Investigation | Train and equip law enforcement officials in the former Soviet Union and Central and Eastern Europe to investigate and respond to nuclear smuggling incidents. | 0.4 | Includes $0.4 million from DOD |
| U.S. Coast Guard | Provide assistance for maritime interdiction of nuclear smuggling. | 1.6 | Includes $1.6 million from State |
| **Total** | | **$86.1** | |

Source: Departments of Energy, State, and Defense, U.S. Customs Service, U.S. Coast Guard, and Federal Bureau of Investigation.

## Some Agencies' Expenditures Have Not Kept Pace with Growth in Funding

Funding for State's Export Control and Related Border Security Assistance program grew over tenfold, from $3 million allocated in fiscal year 1998 to $40.1 million allocated in fiscal year 2001. Due to the rapid increase, some agencies receiving funds from State have carried over millions of dollars in program funds into fiscal year 2002 because they have received more funding than they have been able to spend. For example, Customs' program expenditures have not kept pace with its growth in funding, and it carried over $33.1 million in unspent funds into fiscal year 2002, including $6.5 million in obligated but unspent funds and $26.5 million in funds that had not been obligated or spent. Customs officials attributed the carryover to not receiving funds from State until late in the fiscal year and not obtaining agreements from the recipient countries under which the assistance would be provided. Furthermore, according to Customs and State officials, carryover is to be expected because State provides the funds to Customs under agreements to spend the funds over a 2 to 3 year period.

After September 11, 2001, State received an emergency supplemental appropriation of $24.7 million. State Department officials said that they have designated $21.5 million of the emergency supplemental for assistance (including detection equipment) to six countries.

## U.S. Assistance to Combat Nuclear Smuggling Lacks a Coordinated Approach

Because U.S. efforts are not effectively coordinated, the Departments of Energy, State, and Defense are pursuing separate approaches to enhancing other countries' border crossings, with the result that some countries' border crossings are more vulnerable to nuclear smuggling than others. While DOE and DOD have installed more sophisticated portal monitors at border sites in Russia and another country, the State Department has installed less sophisticated portal monitors in other countries. In addition, no governmentwide plan links all of the six agencies' programs together, which exacerbates the coordination problems.

### Efforts to Coordinate Assistance Have Been Inadequate

The six agencies that are providing training and equipment to combat nuclear smuggling coordinate their assistance through an interagency group chaired by the State Department. The group, which includes representatives from all the U.S. programs that are providing assistance, meets about once a month to discuss such issues as funding and financial management of the agencies' various programs, upcoming assistance activities, and results of program personnel's recent trips to recipient countries. In addition, program managers of the various agencies work together to implement the programs. For example, DOD officials said that they regularly meet with Customs and FBI program managers to implement assistance and that they participate in the FBI and Customs training courses that DOD funds.

A number of agency officials said that coordination has improved since State established a separate office in November 2000—the Office of Export Control Cooperation and Sanctions—to manage and coordinate U.S. assistance. For example, the new office provided funding to Customs to station 22 in-country advisors, covering 25 countries, that are responsible for coordinating the assistance for all of the six agencies within a country. DOD and DOE officials said that the advisors play an important role in implementing their programs. In addition, the new office has assumed responsibility for much of the Nonproliferation and Disarmament Fund assistance related to nuclear smuggling. For instance, the office has taken over responsibility for providing and maintaining radiation detection equipment to countries other than Russia.

Despite these coordination efforts, no one agency is in charge of the overall U.S. effort to provide assistance to combat nuclear smuggling; consequently, the agencies have implemented their programs without always coordinating their efforts through the interagency group. For example, DOD installed portal monitors at three sites in one country of the former Soviet Union before the State official who chairs the interagency

group learned of the project. According to a DOD official, the project was coordinated with other State Department officials. Similarly, although State provides its radiation detection assistance through DOE, the DOE office that works with State is completely separate from the Second Line of Defense program, and a Second Line of Defense official said that his program and the other office do not communicate with each other. According to the official, a few years ago the two offices were discussing the possibility of merging, but the discussions ended after a new director took over the other office even though Second Line of Defense officials still believe that the two offices should be merged. Even within the State Department, different offices implement their programs without full coordination. For example, the Nonproliferation and Disarmament Fund approved a project to install portal monitors in a country after agreeing that the Office of Export Control Cooperation and Sanctions would take over State's radiation detection assistance, and a separate office at State has oversight over the Georgia Border Security and Law Enforcement program even though one of the objectives of the program is to strengthen Georgia's ability to interdict nuclear smuggling. Finally, even though it funds much of the assistance provided by other agencies, State could not provide accurate information on the other agencies' program expenditures during the course of our review. For example, State's records did not match Customs' financial data on expenditures of funds provided to Customs by State. State officials said that they have now developed a financial database to track how the other agencies have spent State's funds.

In addition, DOE, DOD, and State do not share the same views on the appropriate role of each agency. For example, while State sees itself as the agency that is leading the coordination effort and setting policy, a DOD official said that State does not have the necessary expertise or resources to manage the overall U.S. effort. In contrast, DOE officials said that State should have a lead role in coordination and diplomatic support for the assistance programs and that DOE would depend on State to establish the diplomatic basis that would allow the Second Line of Defense program to expand into other countries. However, DOE officials questioned whether State and DOD are the appropriate agencies for installing portal monitors in countries other than Russia.

## Ineffective Coordination Has Resulted in Some Border Crossings Being More Vulnerable to Nuclear Smuggling Than Others

As a result of ineffective coordination, DOE, DOD, and State have installed portal monitors that have different levels of capability to detect weapons-usable nuclear material, leaving some border crossings more vulnerable to nuclear material smuggling than others. While DOE and DOD have installed more sophisticated portal monitors at border sites in Russia and another country, State has installed less sophisticated portal monitors in other countries. In addition, in the mid-1990s, the DOD Cooperative Threat Reduction program provided less sophisticated portal monitors to another country in the former Soviet Union.

The more sophisticated portal monitors detect two types of radiation—gamma and neutron—whereas the portal monitors installed by State and the DOD Cooperative Threat Reduction program detect only gamma radiation. The ability to detect neutron radiation translates into a greater ability to detect weapons-usable plutonium, one of the materials of greatest concern in terms of nonproliferation. In addition, according to DOE officials, due to their configuration and sensitivity the State Department portal monitors are less likely to detect small quantities of highly enriched uranium, the other material that is of greatest nonproliferation concern, or material that is shielded, for example by a lead container or certain parts of a vehicle. DOE's office that installs the portal monitors on behalf of State acknowledged that the less sophisticated portal monitors have a limited capability to detect weapons-usable nuclear material and said that the portal monitors serve mostly as a deterrent to smuggling. In addition, DOE and DOD have taken different approaches even though the two agencies have installed the same Russian-manufactured portal monitors. For example, DOE officials said that the Second Line of Defense program has calibrated the monitors in Russia to detect a smaller quantity of material than the monitors installed by DOD in another country. In contrast, a DOD official said that DOE's approach runs the risk of a high rate of false alarms, which can lead to complacency among officials in charge of responding to alarms.

State Department officials with the Nonproliferation and Disarmament Fund said that they used less sophisticated portal monitors because of their lower cost and the difficulty many countries would have in maintaining sophisticated equipment. For example, some countries lack even the basic infrastructure to operate and maintain portal monitors, such as a source of electricity. Because of the different circumstances existing in each country, State officials said that radiation detection assistance should be tailored to each country's needs. The Director of State's Office of Export Control Cooperation and Sanctions said that State is reevaluating its approach to providing radiation detection equipment,

including installing better equipment where appropriate. Second Line of Defense officials expressed concern about using less sophisticated portal monitors at border crossings on potential smuggling routes leading to countries seeking nuclear weapons. Furthermore, Second Line of Defense officials said that because of the differences in the portal monitors, DOE would replace State's portal monitors with more sophisticated equipment if the Second Line of Defense program expands into another country and perhaps use the old portal monitors at lower-priority sites. Overall, Second Line of Defense officials said that the U.S. government assistance to provide radiation detection equipment is diffuse and lacks a single, coherent approach and that the portal monitors should meet a minimum standard for detecting weapons-usable nuclear material.

The three agencies have also pursued different approaches to providing handheld radiation detection equipment. With support from DOD and State, the U.S. Customs Service has provided customs and border officials with radiation pagers. In contrast, DOE's Second Line of Defense program provides larger handheld detectors but not radiation pagers, and DOE officials said that they view the pagers as personal safety devices that are ineffective at detecting weapons-usable nuclear material. According to State and Customs officials, pagers are a useful part of a radiation detection system at border crossings. Customs officials also said that pagers are just one part of a multi-layered radiation detection system used by border personnel.

## Need Exists for Plan to Guide U.S. Assistance Efforts

No governmentwide plan links all of the six agencies' programs together through common goals and objectives, strategies and time frames for providing assistance, and performance measures for evaluating the effectiveness of assistance. The in-country customs advisors have developed country-specific plans, and DOD has developed a plan for its International Counterproliferation program that includes threat assessments and a prioritization of countries into three levels of weapons of mass destruction proliferation risk in the context of border security and customs enforcement. Similarly, DOE has developed a list of close to 60 border crossings where it plans to install radiation detection equipment as part of the Second Line of Defense program and estimated the cost and timeframe for completing the program. On the other hand, the State Department has no plan for providing radiation detection equipment that details how many portal monitors it plans to install, in what countries, and at which border crossings. Furthermore, the six agencies have not developed a joint assessment of the nuclear smuggling threat and the best mix and location of radiation detection equipment to address the threat.

While DOE conducted an in-depth assessment of the smuggling threat to prioritize the border crossings where it is installing portal monitors, State and DOD have not conducted a similar assessment to prioritize the countries or border crossings to which they are providing radiation detection equipment. Numerous agency officials acknowledged that the U.S. effort to improve countries' ability to combat nuclear smuggling lacks adequate planning. For example, the director of State's Office of Export Control Cooperation and Sanctions said that ideally the U.S. government would have a process for determining how much funding to allocate to each country and what to spend the funds on. Similarly, a DOD official said that the U.S. effort requires a centralized and integrated leadership and a redefinition of the role of each agency in order to overcome coordination issues.

## U.S. Assistance Has Helped Countries Combat Nuclear Smuggling, but Problems with Equipment Undermine Efforts

U.S. assistance has, in general, strengthened the ability of numerous countries throughout the former Soviet Union and Central and Eastern Europe to deter and detect illicit trafficking in nuclear materials. However, serious problems with installing, using, accounting for, and maintaining radiation detection equipment have undermined U.S. efforts. These problems are largely the result of the lack of oversight and follow-up by some of the U.S. agencies providing the equipment. Another problem is that many countries that have received radiation detection equipment are not reporting information about nuclear materials detected by U.S.-supplied equipment. Recently, the United States began stationing advisors in many of the countries receiving the assistance to, among other things, correct equipment problems.

### Recipient Country Officials Cite Benefits of U.S. Assistance

Officials from 17 recipient countries receiving U.S. assistance to combat nuclear smuggling told us that the assistance had provided much needed radiation detection equipment and training. According to officials from several countries, U.S.-supplied portal monitors installed at border crossings and handheld detection equipment represent the only assistance of this type that their countries have received. In other countries the U.S. assistance has supplemented equipment and training received from other countries. For example, Latvia has received radiation detection equipment from Finland, Sweden, Germany, and Denmark, and Estonia has received equipment from Finland and Germany.

In one country, we visited two border crossings with Russia and saw that a U.S.- furnished portal monitor and U.S.-supplied handheld detectors and radiation pagers were being used to inspect cargo and other materials.

According to this country's officials, the U.S.- supplied portal monitors installed at several border crossings are well-maintained and serviced regularly. See figures 1 and 2 for U.S. equipment in that country.

**Figure 1: U.S.-Installed Portal Monitors**

Note: The arrows indicate the location of the portal monitors.

Figure 2: Typical Handheld Radiation Detector Used by Border Guards

In another country we visited, we saw a U.S. Customs Service-furnished mobile x-ray van equipped with a radiation detector being used to inspect luggage and other small items entering the country from Russia  A few hours later, the van was driven to another crossing point along the border where passengers and their possessions were screened at a train station. Passengers' bags and other personal items were passed through an x-ray machine that was part of the van's screening apparatus. Occasionally, the border guard who was operating the x-ray machine would examine the contents of the items that had been x-rayed to determine their exact content.  Figure 3 shows the x-ray van.

Figure 3: U.S.-Supplied Mobile X-Ray Van

Russian customs officials told us that radiation detection equipment funded by DOE's Second Line of Defense program has helped accelerate Russia's plans to improve border security. According to these officials, as of October 2001, DOE had financed the purchase of about 15 percent of Russia's 300 portal monitors. The U.S.-funded equipment is manufactured in Russia and is subject to site acceptance testing conducted by DOE national laboratory personnel. This testing is designed to ensure that portal monitors are placed in an optimal configuration (to maximize detection capability) and that the equipment is being used as intended. According to Russian officials, there is excellent cooperation with DOE on ways to continually improve the performance of the equipment. Russian customs officials also told us that DOE has done a very credible job of making follow-up visits to inspect the equipment and ensure that it is recalibrated as necessary to meet performance specifications.

During our visit to Russia, we observed several U.S.-funded pedestrian portal monitors that were installed at Moscow's Sheremetyevo Airport (see fig. 4) as well as a control room that included video equipment and a

computerized monitoring system, also funded by DOE, that was connected to the portal monitors. DOE's detection equipment installed throughout Russia is monitored by closed circuit cameras. Russian officials tested the equipment we saw at the airport on our behalf. They "planted"—with our knowledge—a radioactive source in an attaché case that we carried past a pedestrian portal monitor, which activated an alarm. A computer screen in the control room displayed our movements past the portal monitor.

**Figure 4: U.S.-Funded Portal Monitors at the Sheremetyevo Airport in Moscow**

U.S. assistance includes training, which U.S. and recipient country officials told us is part of an integrated approach that is needed to combat nuclear smuggling. This approach should include equipment, training, and intelligence gathering on smuggling operations. Training is a critical component of combating nuclear smuggling. For example, border personnel need to be trained in inspection techniques, laboratory specialists need to be able to analyze and properly identify material that is detected and law enforcement officials need to be able to conduct investigations in order to prosecute, when appropriate, individuals apprehended in nuclear smuggling cases. U.S. agencies have trained more

than 3,500 border security and law enforcement personnel in a broad range of weapons of mass destruction interdiction programs. The U.S. Customs Service trained over 2,970 customs and law enforcement officers from more than 25 countries during 1996-2001, and the FBI trained approximately 600 foreign country personnel during a similar period. DOE has funded the development of a guidebook printed in Russian for 300 customs officers to help identify equipment that could be used to develop a nuclear weapon. In addition, DOE, in concert with the Russian Customs Academy, implemented a mobile training program that provides training to customs agents in remote locations.

U.S. agency officials provided several examples to show how U.S.-provided equipment and training have strengthened countries' ability to detect and deter nuclear smuggling.

- In July 2001, portal monitors furnished by DOD to one country detected radioactive material that had been driven in a truck across the border. According to DOD and country officials, the equipment at the border crossing had only been operational for 2 days when the incident occurred.
- According to DOE officials, U.S. equipment in Russia has detected more than 275 instances involving radioactive material. These cases include contaminated scrap metal, irradiated cargo, and other radioactive materials that could pose a proliferation concern.
- In 1999, customs officials in a country that had received DOD/Customs training on inspecting vehicles and passengers for smuggled nuclear materials seized weapons-usable material that had been hidden inside the trunk of a car. According to U.S. Customs officials, this case shows the importance of providing training that combines general border inspection techniques with specialized training in nuclear materials.

## Problems with Equipment Undermine U.S. Assistance Efforts

We found numerous problems with various types of radiation detection equipment that has been provided by DOD, the State Department, and the U.S. Customs Service. According to officials from these agencies and a DOE office responsible for installing portal monitors in some countries, U.S. assistance to combat nuclear smuggling has lacked effective follow-up to ensure that equipment delivered was properly maintained and used for the purposes intended. Several officials told us that there has been inadequate funding for maintenance and training on the use of the equipment in many countries of the former Soviet Union. U.S. officials frequently described this practice as "drop and run." A State Department official told us that it had always been the responsibility of the recipient countries to alert the United States when equipment needed to be

repaired. This official noted, however, that country officials did not systematically report problems and, as a result, malfunctioning equipment was sometimes left unrepaired for extended periods of time. He also noted that until recently there was no consolidated list of all the equipment that different agencies had provided. He compiled such a list but could not be certain that all equipment provided under DOD's Cooperative Threat Reduction program was included.

At a January 2002 IAEA conference, a DOD official provided information about problems with U.S.-supplied equipment. He noted that audits found that detection equipment in several countries had never been used and remained in storage; expensive high-technology equipment was only used in the presence of visiting U.S. delegations; and equipment was going unused because it needed battery replacement, very minor repairs, or major repairs that required out-of-country servicing. The DOD official noted that recipient country officials offered numerous reasons why the equipment was being underutilized or not used at all, including (1) the equipment was too difficult to use; (2) nobody was trained to use it; (3) the equipment would be broken; (4) use of the equipment could cause injuries; (5) repairs were too difficult; (6) no funds had been provided for new batteries; and (7) a lack of knowledge about where or how to send the equipment for repairs.

During the course of our work, we also found numerous problems with U.S. radiation detection equipment provided to many countries, including the following examples, which are based on, among other things, discussions with U.S. program officials and representatives of countries receiving U.S. assistance:

- The condition of equipment provided by the United States at a border crossing in one country in Eastern Europe has been described as deplorable, and the equipment was not being used, according to a November 2001 U.S. embassy memorandum. Another memorandum noted that according to a customs official from this recipient country, the portal monitors were not being used because they emitted too much radiation and posed a health and safety hazard. According to a U.S. official, the incident indicates how little some recipient country officials know about the equipment, because the portal monitors do not emit radiation. In addition, based on a recent inventory, a U.S. official was unable to locate many radiation pagers furnished to that country. In another country, the whereabouts of several dozen handheld radiation detectors could not be determined.

- About half of the pedestrian portal monitors provided to one country in the former Soviet Union were never installed or are not operational. Officials from this country told us that they were given more equipment then they could use. In addition, the equipment had limited capability to detect nuclear material.
- Portal monitors delivered to Lithuania were stored in the U.S. embassy basement for about 2 years because the State Department and the Lithuanian border organization disagreed about the need for a power supply that cost $12,600 to operate the equipment. In February 2002, the monitors were finally installed.
- Equipment worth about $80,000, including radiation protection suits and pagers, could not be given to Estonia as part of a DOD/FBI training program because an agreement governing the release of such equipment had not been finalized. The equipment was placed in an embassy garage for about 7 months before it was transferred to Estonia in December 2001.
- A portal monitor furnished by the State Department to Bulgaria a couple of years ago was installed on an unused road that is not expected to open for another 1-1/2 years. Plans are underway to relocate the equipment.
- In November 2001, a U.S. official visited a border crossing in one country of the former Soviet Union where a portal monitor had been disconnected. Country officials told him that it had been shut off because it was lunchtime and no traffic was being allowed to pass. The monitor is designed to be operated continuously.

We also found problems with the mobile vans equipped with radiation detection equipment furnished by the State Department. These vans have limited utility because they cannot operate effectively in cold climates or are otherwise not suitable for conditions in some countries. For example, customs officials from one country told us that the vans (which had a total cost of about $900,000) they received within the last 2 years had to be moved to a warmer part of the country. Nevertheless, they told us that the vans could only be operated about 9 months each year and that even when operational, they are very fuel inefficient. Officials from another country told us the van they received about 1 year ago has rarely been used because of the cold weather and the expense associated with its operation. They said that the van is now stored in a shipping crate at customs' headquarters.

## Country Advisors Trying to Improve Delivery of U.S. Assistance

In the past 2 years, the State Department has placed advisors in many of the countries receiving U.S. assistance to improve program effectiveness. These advisors, generally retired U.S. Customs Service officials, are responsible for, among other things, developing, coordinating, and

updating recipient country border security requirements. In addition, they seek to ensure that the appropriate foreign officials attend training courses; track the assistance that countries receive from various programs to avoid duplication of equipment; meet with government ministries in the recipient countries; and inventory equipment and determine how it is being used, including assessing its effectiveness. In addition, State is using the advisors to improve equipment sustainability and facilitate routine maintenance and equipment repair. Although the State Department funds them, the advisors work on behalf of all the programs, and DOE and DOD officials said that the advisors play a valuable role in implementing their assistance programs. Country officials we met with also said that the advisors have been effective at identifying program needs and resolving problems with equipment.

## Lack of Consistent Reporting Hampers U.S. Efforts to Measure Impact of Radiation Detection Equipment

According to DOE, State, and other U.S. officials, in many cases countries that have received U.S. radiation detection equipment are not systematically providing information about nuclear materials detected by U.S.-supplied equipment. As a result, it is difficult to determine the overall impact and effectiveness of the equipment. While agencies are receiving feedback on the performance level of equipment, such as whether the equipment is properly calibrated or performing according to technical specifications, limited information is provided about the impact of the equipment—namely to what extent is it detecting weapons-usable and other types of radioactive material. Two U.S. advisors told us that recipient country officials have ignored their requests for this type of information. An official from DOE's office that installs portal monitors in some countries told us that his program does not have the means to verify the effectiveness of portal monitors due to the lack of incident reporting by some countries. He noted that information about nuclear smuggling cases varies from country to country and depends on good relationships between the recipient country's border security organization and the U.S. embassy. Officials from DOE's Second Line of Defense program told us that they receive information about incidents from their Russian counterparts on a voluntary basis. However, the reporting is not consistent and they are not confident that there has been a complete sharing of information about nuclear materials detected with U.S.-funded equipment. DOE is seeking to formalize the reporting of information as part of an overall agreement with Russia on the Second Line of Defense program.

## Other Challenges to Border Security

In addition to the problems with the equipment, there are other factors that impact U.S. efforts to combat nuclear smuggling, including corruption in countries' border organizations and the amount of territory, including

borders that are not clearly marked, that requires protection. According to officials from several recipient countries, corruption is a pervasive problem within the ranks of border security organizations. For example, approximately 1,500 Russian customs officers were fired in 1998 for corruption. Russian customs officials noted that efforts are underway to root corruption out but that this is a slow process. An official from one country told us that border security personnel turned off radiation detection equipment at one border crossing in exchange for a bottle of alcohol. In fiscal year 2002, the U.S. Customs Service started providing a new anti-corruption training course. Regarding the challenge posed by the expanses of territory, numerous recipient country officials told us that it is impossible to secure every border crossing. Every country has green borders—expanses of territory that are not patrolled or regulated by border security personnel. These areas are very attractive to smugglers in general. In addition, borders are not always clearly marked or well established following the breakup of the former Soviet Union. A high-level official from one country's border guard told us that the biggest problem he faces is the lack of agreement with Russia over boundaries. Furthermore, a border security official from another country told us that a dedicated nuclear smuggler has a 90-percent chance of successfully defeating his country's border controls. A customs official from Russia told us that equipment is a deterrent and must be supported by trained border personnel, effective law enforcement, and intelligence gathering operations. He stated that the most effective approach to combating nuclear smuggling is to secure the nuclear material at its source at civilian and military facilities.

## Conclusions

The current multiple-agency approach to providing U.S. assistance to combat nuclear smuggling is not, in our view, the most effective way to deliver this assistance. To date, the efforts of the six U.S. agencies participating in these programs and activities have not been well coordinated, and there is no single agency that leads the effort to effectively establish funding priorities and thoroughly assess recipient country requirements. Coordination is also a problem within agencies providing assistance. We question why, for example, there are two offices within the Department of Energy that are providing radiation detection equipment and two offices within the Department of State that have funded similar types of equipment for various countries. To ensure the efficient and effective delivery of assistance and the timely and effective expenditure of program funds, we believe that the development of a governmentwide plan is needed. Such a plan could identify a unified set of program goals and priorities and define agency roles and responsibilities;

determine program cost estimates; establish time frames for effectively spending program funds; develop strategies to maintain and sustain the operation of equipment; and develop exit strategies for each country receiving assistance, including a plan for transferring responsibility for equipment maintenance to the countries.

We are also concerned about how U.S. equipment is being used by the recipient countries. While foreign officials told us that U.S.-provided equipment had improved their ability to detect radioactive material, some equipment has not been well maintained, adequately accounted for, or installed on a timely basis. A fundamental issue surrounding nuclear smuggling is the sharing of information about incidents that occur in each country. Currently, the agencies that are providing the equipment have limited access to this type of information. There is currently no systematic effort to obtain this data, and the United States depends on the willingness of the countries to voluntary provide information. It is difficult to assess the impact and effectiveness of the U.S.- supplied equipment unless data are routinely obtained and analyzed. We believe that U.S. agency personnel must continue to make the case to each country that sharing such data is of critical importance to the success of the U.S. program and countries' efforts to combat nuclear smuggling.

## Recommendations

We recommend that the Secretary of State take the lead in facilitating the development of a governmentwide plan to help other countries develop an integrated approach to combat nuclear smuggling. The plan should be developed in conjunction with the Secretaries of Defense and Energy (working with the Administrator of the National Nuclear Security Administration), and the Commissioner of the U.S. Customs Service, as well as the heads of other federal agencies participating in this effort. The plan should, at a minimum, identify (1) a unified set of program goals and priorities, including defining participating agencies' roles and responsibilities; (2) overall program cost estimates; (3) time frames for effectively spending program funds; (4) performance measures; (5) strategies to maintain and sustain the operation of the equipment, including cost estimates; and (6) an exit strategy for each country receiving assistance, including a plan for transferring responsibility for equipment maintenance to the host country.

In concert with the development of the plan, we believe there are other steps that could be taken immediately to improve U.S. efforts. We think that this is an opportune time for agencies with duplicative or overlapping

responsibilities to consolidate their efforts under a single agency program office. To that end, we recommend that the

- Secretary of Energy, in consultation with the Administrator of the National Nuclear Security Administration, consolidate radiation detection equipment activities in one DOE office, preferably within the Second Line of Defense program and
- Secretary of State consolidate all border security and nuclear smuggling efforts under one program office.

In addition, we recommend that the Secretary of Energy, in consultation with the Administrator of the National Nuclear Security Administration, and the Secretaries of State and Defense

- strengthen efforts to obtain a full accounting of the equipment that is in each country, including the handheld radiation detection equipment;
- ensure that equipment is installed in a timely fashion and is adequately maintained; and
- seek recipient country assurances that information about nuclear materials detected by U.S.-supplied equipment is shared with U.S. agencies on a timely basis.

## Agency Comments and Our Evaluation

We provided draft copies of this report to the Departments of State, Energy, and Defense; the U.S. Customs Service; the U.S. Coast Guard; and the Federal Bureau of Investigation for their review and comment. The Coast Guard and FBI had no comments on the draft report. DOD provided technical comments, which we incorporated in the report as appropriate. State's, DOE's, and Customs Service's written comments are presented in appendixes III, IV, and V, respectively. The agencies agreed with the facts presented in the report and State specifically said that it agreed with the report's conclusions and recommendations. Customs suggested that we reword our recommendation to specifically include it as one of the agencies to develop a governmentwide plan to combat nuclear smuggling. DOE did not comment on the conclusions and recommendations.

In commenting on the report, the Department of State agreed that interagency coordination to help other countries combat nuclear smuggling can be strengthened. The State Department noted that, per our recommendation, it is taking the lead in facilitating the development of a governmentwide plan to provide detection equipment and maintenance support. State also commented, however, that the report gave insufficient weight to the progress that has been made in the past 1-½ years to improve

coordination and planning. Specifically, State cited its establishment of the Office of Export Control Cooperation and Sanctions, which is responsible for, among other things, managing and coordinating U.S. government export control and related border security programs. In addition, the Office chairs an interagency working group that evaluates, prioritizes, and approves projects that U.S. agencies undertake to improve countries' export control and related border security capabilities. The Department also stated that it has taken steps to improve internal coordination as well as accountability for equipment previously provided to other countries and noted that the country advisors play a prominent role in these matters. Regarding these points, we recognized in the draft report that State had improved coordination through an interagency group that it chairs. Further, we noted that recipient country officials told us that the advisors play a valuable role in implementing their assistance programs. In addition, we recognized in the draft report that the Office of Export Control Cooperation and Sanctions has improved coordination. However, we continue to believe that interagency coordination has been inadequate and needs to be improved. State acknowledged this point in its comments and said that a more coherent, better coordinated approach to providing radiation detection equipment is needed. The Department concurred with all of our recommendations and said that it will work with other agencies to implement them.

In its comments, the Department of Energy's National Nuclear Security Administration agreed that it is difficult to assess the impact and effectiveness of U.S.-supplied equipment unless data from the recipient countries are routinely obtained and analyzed. DOE believes that sharing data is critical to the success of the U.S. program and countries' efforts to combat nuclear smuggling. DOE also endorsed the need for a more uniform approach to radiation monitoring at countries' borders. The Department wanted to clarify that it has three programs that operate in this area: the Second Line of Defense program that has historically focused on Russia; the International Export Control program that deals with equipment that has both civilian and military applications, material and technology; and a program that uses Department of State funding to maintain and install equipment outside of Russia. DOE also pointed out that radiation detection monitors installed by other U.S. agencies are not as sensitive to special nuclear materials (plutonium and highly enriched uranium) as the monitors funded by DOE, and have limited or no ability to detect shielded plutonium. Regarding DOE's point about its different programs, we noted in the draft report that DOE has three separate programs under way to combat nuclear smuggling. We highlighted the Second Line of Defense program, however, because it is DOE's primary

effort to combat nuclear smuggling. Regarding DOE's comment about the limitations of equipment installed by other U.S. programs, we recognized in the draft report that DOE has installed more sophisticated portal monitors in Russia and that the State Department has installed less sophisticated equipment in other countries.

The U.S. Customs Service noted that the U.S. government's nonproliferation efforts are not limited to nuclear materials, but instead cover the entire spectrum of weapons of mass destruction, including chemical and biological weapons. Customs also noted that although our report focused on the use of technology to detect nuclear or radioactive materials, the importance of highly skilled and trained border inspection personnel should not be underestimated. Finally, because Customs has been the largest recipient of funds appropriated for nuclear smuggling assistance, it suggested that our recommendation be reworded to include Customs specifically as one of the agencies to develop a governmentwide plan to help other countries combat nuclear smuggling. While we agree with Customs' assertion that U.S. nonproliferation activities are aimed at a broad range of threats, our review focused only on the nuclear material smuggling component of this effort. We agree with Customs' point about highly skilled and trained personnel, and we recognized in the draft report that training is a critical component and should be part of an integrated approach to combat nuclear smuggling. Finally, we have reworded our recommendation to specifically identify Customs as one of the agencies that should develop a governmentwide plan to help other countries combat nuclear smuggling.

## Scope and Methodology

To determine program expenditures, we obtained budget, obligation and expenditure data through fiscal year 2001 from the six agencies participating in the program—the Departments of Energy, State, and Defense; the U.S. Customs Service; the U.S. Coast Guard; and the Federal Bureau of Investigation. Our task was complicated because each agency collects and reports its financial data differently. We attempted to standardize the reporting format for each agency and verify the accuracy of the data by crosschecking financial records maintained by each agency. When we found discrepancies, we brought them to the attention of the agencies. The agencies' data did not allow us to aggregate cost on a country-by-country basis because data was generally reported on a project, not country, basis. Our task was further complicated because the Department of State, which is responsible for tracking funds it has received for border security assistance, did not have an adequate financial management system in place to report program expenditures. Department

of State officials responsible for monitoring program expenditures are aware of this deficiency and are taking steps to improve its current financial management system.

To assess how well U.S. assistance is coordinated, we met with program officials from each of the agencies providing assistance and reviewed pertinent documents, including individual agency's assistance plans, as available. We assessed coordination through the interagency group headed by the Department of State and met with the lead official of that effort--the Director of Export Control Cooperation and Sanctions--and members of his staff. We also discussed coordination issues with U.S. advisors stationed in countries receiving U.S. assistance including Azerbaijan, Kyrgyzstan, Latvia, Malta, Romania, Slovenia, Ukraine, and Uzbekistan. Several of these advisors were responsible for tracking assistance efforts in more than one country. For example, the advisor stationed in Latvia was also responsible for Lithuania, Estonia, and Poland.

We obtained information from a number of sources to assess the effectiveness of the U.S. assistance. We visited Estonia, Latvia, Poland, and Russia to obtain a first hand look at U.S. radiation detection equipment installed at different border crossings and meet with officials responsible for border security, law enforcement, and export controls. We also attended a technical conference on radiation detection equipment sponsored by the IAEA in January 2002, where we met with officials from 13 additional countries that had received U.S. assistance: Azerbaijan, Belarus, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Lithuania, Republic of Macedonia, Malta, Romania, the Slovak Republic, Turkey, and Uzbekistan. We also met with representatives from the IAEA, the U.S. Mission to International Organizations in Vienna, and the U.S. embassies in Latvia, Estonia, Poland, and Russia to discuss nuclear smuggling. We obtained technical information on radiation detection equipment from DOE; Lawrence Livermore National Laboratory; Los Alamos National Laboratory; the Savannah River Site; and one equipment manufacturer, TSA Systems Ltd.

We conducted our review between May 2001 and April 2002 in accordance with generally accepted government auditing standards.

As agreed with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after the date of this letter. At that time, we will send copies of this report to the Secretary of Energy; the Administrator, National Nuclear Security

Administration; the Secretary of State; the Secretary of Defense; the Commissioner, U.S. Customs Service; the Director, Federal Bureau of Investigation; the Commandant, U.S. Coast Guard; the Director, Office of Management and Budget; and interested congressional committees. We will make copies available to others upon request.

If you have any questions concerning this report, I can be reached at (202) 512-3841. Major contributors to this report include Gene Aloise, Joseph Cook, and Glen Levis.

Sincerely yours,

(Ms.) Gary L. Jones
Director, Natural Resources
and Environment

# Appendix I: Information on Nuclear Smuggling Incidents

This appendix provides information about nuclear material smuggling incidents over the past decade. It focuses primarily on 20 incidents involving weapons-usable nuclear material. The information was obtained from, among other sources, data provided by the International Atomic Energy Agency (IAEA)[1] and the Department of Energy.

Since the early 1990s, there have been numerous reports of illicit trafficking in many types of nuclear materials worldwide. According to IAEA, nuclear materials include nuclear source material, such as natural uranium, depleted uranium, thorium,[2] plutonium, and uranium enriched in the isotopes U-233 or U-235. Plutonium and highly enriched uranium[3]—known as weapons usable material—are considered to pose the greatest proliferation risk because they are used to produce nuclear weapons. In 1993, IAEA established a database to record incidents involving illicit trafficking in nuclear materials. Sixty-nine countries, or about one-half of IAEA's member states, currently participate in the database. As of December 31, 2001, IAEA listed 181 confirmed incidents involving the illicit trafficking in nuclear materials, including weapons-usable material. According to IAEA, a confirmed incident is one in which the information has been verified to IAEA through official points of contact from the reporting country. Of the 181 confirmed illicit trafficking incidents reported by IAEA, 17 involved either highly enriched uranium or plutonium. More than half of the 17 incidents involving weapons-usable material occurred during 1993-95. The remaining cases occurred during 1999-2001.

## Incidents Involving Weapons Usable Nuclear Material

IAEA, DOE, and other U.S. officials provided us with information about 20 cases involving the smuggling of weapons-usable material since 1992. Officials told us that the actual number of smuggling cases involving weapons-usable material is probably larger than what is currently being reported because countries are not always willing to share sensitive

[1] IAEA is an autonomous organization affiliated with the United Nations. Its objectives are to promote the peaceful use of nuclear energy and to verify that nuclear material under its supervision or control is not used to further any military purpose.

[2] Thorium is a radioactive material that is used in a wide array of products and processes. Handling and disposing of thorium is a challenge because it is radioactive and produces radon gas when it decays.

[3] Highly enriched uranium means uranium enriched to 20 percent or more in the isotope U-235. Uranium enriched in U-235 above the level found in nature (.071 percent) but less than 20 percent is called low enriched uranium.

nuclear smuggling information. Furthermore, the premature public disclosure of information could undermine an ongoing criminal investigation or could be politically embarrassing. Another factor that affects the number of cases reported is the credibility of the information. DOE officials who analyze smuggling cases told us that a significant amount of time must be spent analyzing a particular incident before it can be deemed credible, and many of the reported incidents turn out to be unsubstantiated. For example, several reported cases over the years have been scams whereby a "smuggler" has been apprehended trying to sell material that is purported to be weapons-usable but is not. Regardless of the number of actual cases of nuclear smuggling, officials stated that the threat posed by illicit trafficking is real and should not be underestimated. The head of IAEA's Office of Physical Protection and Material Security told us that every reported case should be taken seriously. Further, she noted that countries need to more systematically report smuggling incidents so that better assessments can be performed.

Officials from IAEA, DOE, and other U.S. agencies provided several observations about the 20 incidents involving weapons-usable nuclear material.

- Many of the incidents involved material that came from countries of the former Soviet Union, primarily Russia.
- From the early 1990s through about 1998, the nuclear material was seized primarily in Russia and eastern and western Europe. In the past few years, there appears to have been an increase in trafficking in nuclear material through the Caucasus (Georgia), Central Asia (Kyrgyzstan), Greece, and Turkey. According to IAEA, it is uncertain whether the increase represents more trafficking in this material or better detection and reporting of activities that may have been going on in earlier years.
- Most of the smuggling incidents involved relatively small quantities of weapons-usable material that were insufficient to construct a nuclear bomb. In some cases, the small quantities of material involved may indicate that that the seller was trying to attract a potential buyer with a "sample size" quantity of material. In other cases, it appears doubtful that the traffickers had or claimed access to larger quantities of nuclear material.
- The incidents do not appear to be part of an organized criminal or terrorist activity or organization.
- In most of the incidents, the weapons-usable material was seized as a result of a police investigation. The material was not detected by equipment or personnel stationed at border crossings. One notable exception involved material detected by customs agents at a Bulgarian

border crossing. In addition, the Bulgarian incident represents one of a few reported instances where the nuclear material was shielded or protected to avoid detection.

Table 2 provides information about the 20 incidents involving the smuggling of weapons-usable material since 1992. A brief discussion of some of the significant incidents follows the table.

**Table 2: Nuclear Smuggling Incidents Involving Weapons-Usable Material since 1992**

| Date | Source of material | Country where material seized | Material/quantity | How material was found |
|---|---|---|---|---|
| May 1992 | Russia (Luch Scientific Production Association) | Russia | 1.5 kilograms (90 percent highly enriched uranium) | Discovered by police investigation |
| May 1993 | Russia | Lithuania | 0.1 kilogram (50 percent highly enriched uranium) | Discovered by police investigation |
| July 1993 | Russia | Russia | 1.8 kilograms (36 percent highly enriched uranium) | Discovered by police investigation |
| November 1993 | Russia | Russia | 4.5 kilograms (20 percent highly enriched uranium) | Discovered by police investigation |
| March 1994 | Russia | Russia | 3.05 kilograms (90 percent highly enriched uranium) | Discovered by police investigation |
| May 1994 | Unspecified | Germany | 0.006 kilograms plutonium-239 | Discovered by police investigation |
| June 1994 | Russia | Germany | 0.0008 kilograms (87.8 percent highly enriched uranium) | Discovered by police investigation |
| July 1994 | Russia | Germany | 0.00024 kilograms plutonium | Discovered by police investigation |
| August 1994 | Russia | Germany | 0.4 kilograms of plutonium | Discovered by police investigation |
| December 1994 | Russia | Czech Republic | 2.7 kilograms (87.7 percent highly enriched uranium) | Discovered by police investigation |
| June 1995 | Russia | Czech Republic | 0.0004 grams (87.7 percent highly enriched uranium) | Discovered by police investigation |
| June 1995 | Russia | Czech Republic | 0.017 kilograms (87.7 percent highly enriched uranium) | Discovered by police investigation |
| June 1995 | Russia | Russia | 1.7 kilograms (21 percent highly enriched uranium) | Discovered by police investigation |
| May 1999 | Russia | Bulgaria | 0.004 kilograms of highly enriched uranium | Interdiction at border by Bulgarian customs. |
| October 1999 | Unspecified | Kyrgyzstan | 0.0015 kilograms of plutonium | Discovered by police investigation |
| April 2000 | Unspecified but Russia suspected | Georgia | 0.9 kilograms of highly enriched uranium (30 percent) | Possible combination of radiation detection equipment at border and police investigation |
| September 2000 | Possibly Russia and/or Ukraine | Georgia | 0.0004 kilograms of plutonium | Discovered by police investigation |

| Date | Source of material | Country where material seized | Material/quantity | How material was found |
|---|---|---|---|---|
| December 2000 | Germany | Germany | Less than 1 milligram of plutonium | Radioactive contamination disclosed in a test. |
| January 2001 | Unspecified | Greece | Approximately 0.003 kilograms of plutonium | Discovered by police investigation |
| July 2001 | Unspecified | France | About 0.005 kilograms of highly enriched uranium (approximately 80 percent enriched) | Discovered by police investigation |

Note: Uranium enriched with 20 percent or higher U-235 is considered weapons-usable material. One kilogram equals 2.2 pounds. One thousand grams equal 1 kilogram and 1 gram is equal to about 0.04 ounces, or the weight of a paperclip.

Source: Various U.S. agencies and international organizations.

## Luch Scientific Production Association (Russia), 1992

This incident involved a chemical engineer and long-time employee of the State Research Institute, Scientific Production Association (also known as Luch) which is located 22 miles from Moscow.[4] Beginning in May 1992, over a 5-month period, the individual smuggled out of the institute small quantities of highly enriched uranium totaling 1.5 kilograms. In October 1992, the engineer was arrested because police suspected him of stealing equipment from the Luch facility. Once in custody, the police discovered the nuclear material that he had stolen. The individual did not have a specific buyer in mind, but was trying to determine if there was a market for the stolen nuclear material. He was tried before a Russian court and received 3 years' probation.

## Vilnius, Lithuania, 1993

In May 1993, Lithuanian authorities recovered 4.4 tons of beryllium in a smuggling investigation. Beryllium is a metal that is used in the production of, among other things, x-ray tubes, lasers, computers, aircraft parts, nuclear reactors, and nuclear weapons. When Lithuanian authorities seized the material, they discovered that some of the beryllium (141 kilograms) was contaminated with approximately 0.1 kilogram of highly enriched uranium. There was no evidence that the individuals involved were aware that the beryllium contained the enriched uranium. Some reports indicated that the beryllium originated at the Institute of Physics and Power Engineering in Russia. This institute is involved in the

[4] This institute is involved in developing space and mobile reactors, including the TOPAZ reactor used in Russian satellites. Luch has several tons of weapons-usable material on site.

research and development of nuclear power reactors and employs about 5,000 people and possesses several tons of weapons-usable material.

## Murmansk, Russia, 1993

In July 1993, two Russian naval enlisted personnel stole two fresh fuel rods from a storage facility in Murmansk, Russia. These rods were for Russian naval propulsion reactors that power submarines and contained 36-percent enriched uranium. (Uranium enriched at 20 percent or greater is considered to be weapons usable material.) The amount of material totaled about 1.8 kilograms of highly enriched uranium. Russian security officers discovered the missing material and apprehended the individuals before the material left the Murmansk area. One of the individuals arrested was a guard at the facility and was suspected by authorities after the material was missing. The two enlisted personnel who were caught implicated two Russian naval officers in the plan. However, at the ensuing trial only the two enlisted personnel were convicted and sentenced to prison terms of 4 and 5 years.

## Murmansk, Russia, 1993

In November 1993, approximately 4.5 kilograms of 20-percent enriched uranium, intended for use in submarine propulsion reactors, was stolen from a fuel storage facility in the Sevmorput shipyard near Murmansk, Russia. Three individuals were arrested in connection with the theft, including two naval officers. The group stored the fuel rods in a garage for several months while they were looking for a prospective buyer. The three individuals were arrested and two of the men received 3-1/2-year sentences while the third person was acquitted.

## St. Petersburg, Russia, 1994

In March 1994, three men were arrested in St. Petersburg, Russia for trying to sell approximately 3 kilograms of uranium enriched to 90 percent. The material was allegedly smuggled from the Elektrostal Production Association which is located in the Moscow suburbs. The facility produces low-enriched uranium for commercial nuclear power reactors and also has the capacity to produce highly enriched uranium for nuclear powered icebreakers and submarines. The material was smuggled out of the facility and approximately 500 grams of the material were found inside a glass jar in a refrigerator in one of individual's homes.

## Tengen, Germany, 1994

In May 1994, German police discovered a lead container containing 0.006 kilograms of highly concentrated plutonium-239 in the home of a German citizen. The material found in the container was a mixture of many components, including aluminum, silicon, mercury, zirconium, broken glass, and brush bristles as well as the plutonium. The presence of mercury in the mixture suggests that the material may have been used as part of a red mercury scam. [5] In November 1995, the German national was sentenced to 2-1/2 years in prison for violating arms control laws. The sentence was added onto a 3-year term he was already serving time for counterfeiting.

## Landshut, Germany, 1994

In June 1994, less than 0.001 kilogram of highly enriched uranium was recovered in Landshut, Germany, a city near Munich. This material, along with 120 low enriched uranium fuel pellets, was found as a result of a police undercover operation. The material was seized in an undercover police operation. Three individuals apprehended were citizens of the Slovak Republic and one was a resident of Germany. A German court sentenced several of the individuals to probationary terms but one of the group's leaders was sentenced to 2 years in prison.

## Munich, Germany, 1994

In 1994, undercover German police acting as prospective buyers intercepted approximately 0.4 kilograms of plutonium at the Munich Airport. It is believed that the material originated in Russia's Institute of Physics and Power Engineering. The institute, which is operated by Russia's Ministry of Atomic Energy, is involved in the research and development of nuclear power reactors and possesses several tons of weapons-usable material. The material was in a suitcase that had arrived on a flight from Moscow. The individuals involved in the smuggling case were from Colombia and Spain. A German court sentenced the Colombian national to almost 5 years in prison and the Spanish nationals received prison sentences of between 3 and 4 years. All of the individuals were expelled from Germany after serving half of their sentences. By February 1996, Russian authorities had arrested several Russian accomplices, including a key figure involved in the theft of the material from the institute.

[5] According to DOE, red mercury has been used in over 50 scams since 1979. Red mercury is a material that would-be smugglers have tried to sell claiming that the material can be used to produce a nuclear weapon.

## Prague, Czech Republic, 1994

In December 1994, police in Prague, Czech Republic, seized approximately 2.7 kilograms of highly enriched uranium. The material is believed to have been stolen from the Russian Institute of Physics and Power Engineering. The individuals involved included a Tajikistan national, a former Russian nuclear institute worker, and at least one Czech national. The material was brought into the Czech Republic on a train and then hidden for about 6 months while the individuals involved tried to sell it. They were arrested after Czech authorities received an anonymous tip and a Czech judge gave several members of the group prison sentences ranging from about 18 months to 8 years.

Two related incidents were reported in June 1995 and involved the seizure of highly enriched uranium in the Czech Republic. According to available information, the composition of the material and its location were linked to the 1994 Prague and Landshut incidents. In both instances, the small quantities of material involved indicated that it was a sample that could be used to attract a potential buyer.

## Rousse, Bulgaria, 1999

In May 1999, Bulgarian customs officials at the Rousse border checkpoint seized a vial containing about 0.004 kilograms of highly enriched uranium on the Bulgarian/Romanian border. Rousse is a city that serves as Bulgaria's principal river port and is a transportation hub for road and rail traffic. The material was hidden in a shielded (lead) container inside the trunk of a car being driven by a Turkish citizen. The driver attempted to sell the material first in Turkey and then traveled through Bulgaria on his way to Romania, where he planned to find a buyer. A Bulgarian customs agent, using standard profiling techniques, suspected that the driver was a smuggler. A search of the driver's papers revealed a document describing uranium. When the driver attempted to bribe the customs officer, his car was thoroughly inspected and the officer eventually discovered the vial containing the weapons-usable nuclear material. Bulgarian scientists concluded that the material was highly enriched uranium. Although the source of the material is not certain, it is probable that it came from the Mayak Production Association in Russia. This large complex produces special isotopes used for industrial, agricultural, and medical purposes and also reprocesses naval and civil nuclear power reactor fuel for plutonium and uranium recovery.

## Kara-Balta, Kyrgyzstan, 1999

In October 1999, two persons were arrested in the act of selling a small metallic disk containing 0.0015 kilograms of plutonium. The item was analyzed by the Institute of Nuclear Physics in Kazakhstan and the two individuals arrested were convicted and sentenced to prison.

## Batumi, Georgia, 2000

In April 2000, Georgian police arrested four persons in Batumi, Georgia, for unauthorized possession of 0.9 kilogram of highly enriched uranium fuel pellets. Batumi is a seashore resort at the Black Sea located along the Georgia-Turkey border. According to one press report, the material may have been smuggled from Russia. The pellets mass and shape, together with the reported enrichment level, suggest that the pellets were produced for use in a commercial or experimental fast breeder reactor. Another report also stated that the smugglers were detected when they crossed the Russian border into Georgia, possibly by radiation monitoring equipment and were then trailed to the city of Batumi, where they were apprehended. It is believed that the individuals were trying to smuggle the material into Turkey.

## Tbilisi, Georgia, 2000

In September 2000, three persons were arrested at Tbilisi airport for attempting to sell a small quantity of mixed powder containing about 0.0004 kilograms of plutonium and 0.0008 kilograms of low enriched uranium, as well as a 0.002 kilogram sample of natural uranium. According to press reports, an official in the Georgian Ministry of State Security said that two individuals arrested were Georgian citizens, and the third was from Armenia. The individuals said they had brought the uranium and plutonium from Russia and Ukraine to sell it.

## Germany, 2000

In December 2000, a worker at a closed spent fuel reprocessing plant removed radioactively contaminated items from the facility, deliberately evading radiation safety monitors. The contaminated items, described as rags and a test tube filled with aging waste material, contained a very minute amount of plutonium.

## Greece, 2001

In January 2001, police found a cache of about 300 metallic plates buried in a forest in northern Greece. The material in the plates was determined to be plutonium and a radioactive source known as americium. According to one report, the material had been smuggled into Greece either from one of the countries of the former Soviet Union or Bulgaria. Each plate contained a small quantity of plutonium but the total amount was about

0.003 kilograms. An official from Greece's atomic energy commission said that the quantity of nuclear material found was insufficient to build a nuclear weapon but the material posed a health hazard. A law enforcement officer speculated that the individuals who buried the metal plates were probably waiting for a potential buyer.

## France, 2001

In July 2001, police seized several grams of highly enriched uranium and arrested three suspects in Paris, France. According to preliminary reports, the enrichment level was about 80 percent, but results of laboratory analysis have not yet been reported to the IAEA. One of the suspects had recently completed a prison sentence for fraud charges, and the other two reportedly were citizens of Cameroon. According to one press account, French police found the material encased in a glass bulb that was stored in a lead cylinder.

# Appendix II: U.S. Government Assistance Programs

This appendix provides additional information about each of the six agencies that are providing assistance to combat nuclear smuggling.

## Department of Energy

DOE has two programs that have provided assistance to combat nuclear material smuggling—the Second Line of Defense program and the International Export Control program. From fiscal year 1997 through 2001, DOE spent $11.2 million on the Second Line of Defense program, including $2.7 million provided by the State Department, to install 70 portal monitors at eight border crossings in Russia and provide 20 handheld radiation detectors. The eight border crossings include an airport in Moscow, six seaports and one railroad crossing. The eight border crossings are the first of close to 60 sites that DOE has included in the Second Line of Defense program based on a study in which DOE evaluated the need for radiation detection equipment at over 300 border crossings in Russia. DOE prioritized the border crossings based on factors that might increase the risk that potential smugglers would use those border crossings to smuggle nuclear material out of Russia. For example, the study placed a higher priority on border crossings that are close to Russian facilities that store weapons-usable nuclear material or to potential markets for smuggled nuclear material. DOE began work at two additional border crossings in Russia in fiscal year 2001 and 17 additional border crossings in fiscal year 2002. DOE expects that it will complete 12 of the sites in fiscal year 2002.

DOE officials said that they have taken a number of steps to ensure that radiation detection equipment is operated and maintained and that Russia is using the equipment for the intended purpose. First, DOE uses equipment manufactured in Russia by a Russian contractor in order to facilitate equipment installation and maintenance. Then, after the Russian contractor installs the systems, DOE tests the equipment at the border crossings to ensure that the portal monitors are placed in an optimal configuration and calibrated correctly and that they are installed as agreed. For example, DOE conducted testing in October 2000 and found that some portal monitors were not configured optimally or calibrated correctly and that some pedestrian and vehicle crossings did not have radiation detection equipment. DOE officials said that they withheld final payment for installation until the contractor submitted evidence showing that any problems had been resolved.

According to DOE officials, the Russian government is strongly committed to the Second Line of Defense program and has provided DOE with good access to the border crossings where equipment is being installed. For example, in October 2000, Russian officials allowed DOE to participate in

a search of a truck that set off an alarm at one of the portal monitors provided by DOE. (The search revealed that the truck was transporting fertilizer, which can cause a false alarm.) In addition, DOE estimated that Russia spent $300,000 to install 14 pedestrian portal monitors at another terminal of the airport in Moscow.

DOE budgeted $10 million for the Second Line of Defense program and spent $8.5 million from fiscal year 1997 through 2001, and the program received $12 million in fiscal year 2002 appropriations.[1] The State Department provided a total of $7.5 million to support the Second Line of Defense program—$5.1 million to pay the Russian enterprise that manufactures and installs the portal monitors and $2.4 million that it provided to DOE. Of the $5.1 million for the Russian contractor, State spent $2.6 million through fiscal year 2001.[2] Of the $2.4 million that it received from State (through the Export Control and Related Border Security Assistance program), DOE spent $0.1 million through fiscal year 2001 and carried over $2.3 million in unspent funds into fiscal year 2002.

DOE spent $22 million from fiscal year 1992 through 2001, including $2.4 million from the State Department, on assistance to countries of the former Soviet Union—primarily Russia, Ukraine, and Kazakhstan—to improve their ability to control the export of goods that could be used in the development of nuclear weapons. The assistance provided under this program falls into three general categories: export licensing, industry awareness and compliance, and border enforcement. The export licensing assistance helps establish the regulations and procedures for issuing licenses to enterprises that allow them to export their goods and technologies. For example, DOE is providing Ukraine and Kazakhstan with computerized export control licensing systems that are specific to nuclear goods. Industry awareness and compliance consists primarily of workshops for enterprises that need training in understanding the export control system and complying with export control laws and regulations. DOE officials estimate that about 1,000 or so enterprises in Russia, most of

[1] DOE carried over $0.9 million in unspent funds into fiscal year 2002 and transferred $0.7 million from Second Line of Defense to the International Export Control Program in fiscal year 2001 when DOE made the Second Line of Defense program part of the Material Protection, Control, and Accounting program.

[2] The $5.1 million includes $3 million from the Nonproliferation and Disarmament Fund and $2.1 million from the Export Control and Related Border Security Assistance program. The Nonproliferation and Disarmament Fund has a contract with the Russian enterprise and manages the entire $5.1 million in funding.

which are spin-offs of the nuclear weapons complex, need such training. Border enforcement assistance consists of equipment and training to help customs officials stationed at border crossings recognize nuclear-related good and technologies that require an export license before they can be exported from the country.

Table 3 shows a breakdown of International Export Control Program expenditures by country and source of funding. State's Export Control and Related Border Security Assistance program provided a total of $4.9 million through fiscal year 2001 to support the program, of which DOE spent $2.4 million through fiscal year 2001 and carried over $2.5 million in unspent funds into fiscal year 2002.

**Table 3: International Export Control Program Expenditures through Fiscal Year 2001**

Dollars in millions

| Country | DOE funds | State funds | Total |
|---|---|---|---|
| Russia | $4.6 | $0.5 | **$5.1** |
| Ukraine | 2.1 | 0.4 | **2.4** |
| Kazakhstan | 1.3 | 0.6 | **1.9** |
| Baltic states | < 0.1 | 0.2 | **0.2** |
| Regional/other | 11.7 | 0.8 | **12.5** |
| **Total** | **$19.6** | **$2.4** | **$22.0** |

Note: Regional/other expenditures includes $9.3 million spent from fiscal years 1992 through 1997 that DOE was not able to break down by country.

Source: DOE.

In addition to the Second Line of Defense program and the International Export Control Program, DOE spent $0.5 million on the Special Technologies Program to install portal monitors in countries other than Russia with funding from the State Department Nonproliferation and Disarmament Fund. State's Export Control and Related Border Security Assistance program also provided $0.5 million to this office to repair and maintain portal monitors already installed, but DOE had not spent any of this funding as of the end of fiscal year 2001. DOE also spent $1.3 million in DOD funds to support DOD's Cooperative Threat Reduction program. For example, DOE's Los Alamos National Laboratory helped to install portal monitors in one country in the former Soviet Union.

## Department of State

The State Department has provided assistance to combat nuclear smuggling primarily through two programs—the Nonproliferation and Disarmament Fund and the Export Control and Related Border Security Assistance program. In addition, the Georgia Border Security and Law Enforcement program has a small radiation detection component. State established the Nonproliferation and Disarmament Fund in 1994 to provide funding for unexpected needs or opportunities in U.S. nonproliferation efforts. Of the $115 million the fund received from fiscal year 1994 through 2001, State spent $8.5 million on assistance to combat nuclear smuggling. State provided radiation detection equipment and other assistance to 22 countries including vehicle portal monitors, mobile vans equipped with
x-ray machines and radiation detection equipment, handheld radiation detectors, dosimeters, and radiation pagers.[3] The projects also provided customs officials and border guards with other equipment such as fiber optic scopes to search fuel tanks, special equipment to detect chemicals and metals that could be used in weapons of mass destruction, night vision equipment, and radios.

Other Nonproliferation and Disarmament Fund projects included assessments of countries' ability to interdict nuclear smuggling, multinational conferences on the threat of nuclear material smuggling and techniques for analyzing seized nuclear material, and course development for hands-on training in interdicting nuclear smuggling offered at Pacific Northwest National Laboratory. Although State has begun to consolidate assistance for combating nuclear smuggling under the Export Control and Related Border Security Assistance program, it continues to provide some assistance through the Nonproliferation and Disarmament Fund. In particular, in fiscal year 2001, State approved a $1.3 million Nonproliferation and Disarmament Fund project to install vehicle portal monitors at up to 16 sites in one country, and a $0.5 million project to assist another country upgrade their domestically produced portal monitors to better detect weapons-usable nuclear material. State also provided $4.3 million from the Nonproliferation and Disarmament Fund to DOE and the U.S. Customs Service to implement part of the assistance—$3 million to DOE's Second Line of Defense Program in Russia, $0.5 million to DOE's Special Technologies Program to install the portal

[3] The countries included Armenia, Azerbaijan, Bulgaria, Cyprus, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Malta, Moldova, Poland, Romania, Slovakia, Slovenia, Turkey, Ukraine, and Uzbekistan.

monitors provided by State, and $0.8 million to the U.S. Customs Service to help State provide equipment and training to the recipient countries.

From fiscal year 1998 through 2001, the State Department allocated $86.6 million for the Export Control and Related Border Security Assistance program. State spent $2.7 million of that amount and provided $40.2 million to the U.S. Customs Service, $4.4 million to the U.S. Coast Guard, $4.9 million to DOE's International Export Control Program, $4.5 million to DOE's Second Line of Defense program, and $0.5 million to DOE's Special Technologies Program, which installs and maintains portal monitors in countries other than Russia on behalf of State.[4] After September 11, State received an emergency supplemental appropriation of $24.7 million for the program. State's own $2.7 million in expenditures included $0.9 million for three vans equipped with radiation detectors and x-ray machines for Russia, $0.2 million for a van for another country, and $0.4 million to support a multinational conference on export controls and travel expenses of program personnel. State also spent $0.7 million to hire outside firms to conduct audits of the funding it provided to other agencies and evaluations of assistance provided to three countries that State considers more advanced in terms of their ability to interdict nuclear smuggling. To provide criteria for evaluating the capability of countries receiving U.S. assistance to interdict smuggling, State's Office of Export Control Cooperation and Sanctions, which manages the program, developed a list of export control system standards by which to evaluate export control systems in host countries. The standards include criteria for evaluating the ability of countries to interdict smuggling using radiation detection equipment at border crossings.

State has allocated funds for the Export Control and Related Border Security Assistance program primarily from the FREEDOM Support Act, which is targeted to the Newly Independent States of the former Soviet Union, and from the Nonproliferation, Anti-Terrorism, Demining and Related Programs account. Table 4 shows funding levels and sources for export control and related border security assistance from fiscal year 1998 through 2001.

[4] State also used the Export Control program to provide $15.9 million to Department of Commerce assistance to improve countries' export control systems and $0.8 million to DOD to update an export control computer system that the Cooperative Threat Reduction program provided to one country.

**Table 4: Export Control and Related Border Security Assistance Program Funding, Fiscal Year 1998-2001**

| Dollars in millions | 1998 | 1999 | 2000 | 2001 | Total |
|---|---|---|---|---|---|
| Nonproliferation, Anti-Terrorism, Demining and Related Programs | $3.0 | $5.0 | $14.5 | $19.1 | **$41.6** |
| FREEDOM Support Act | 0 | 0 | 15.0 | 21.0 | **36.0** |
| Other | 0 | 4.0 | 5.0 | 0 | **9.0** |
| Emergency supplemental appropriation | 0 | 0 | 0 | 24.7 | **24.7** |
| **Total** | **$3.0** | **$9.0** | **$34.5** | **$64.8** | **$111.3** |

Source: State Department.

In addition to the Nonproliferation and Disarmament Fund and the Export Control and Related Border Security Assistance program, State's Georgia Border Security and Law Enforcement program provides some radiation detection assistance to combat nuclear material smuggling. The Georgia program focuses more broadly on developing the country's border infrastructure, assisting it to gain control of its border including its seacoast, and strengthening border security against any type of crime such as drug smuggling. One of the objectives of the program is also to strengthen the country's border security against nuclear smuggling. Customs, which manages the program for State, received a total of $71.1 million from State and spent $38.3 million through fiscal year 2001, of which $0.2 million was for radiation detection equipment including two portal monitors and 44 handheld radiation detectors.

## Department of Defense

From fiscal year 1993 to about 1998, the DOD Cooperative Threat Reduction program spent $16 million on assistance to five countries. In addition, DOD provided $1.3 million to DOE and $1.1 million to the U.S. Customs Service to implement some of the assistance. Of the $16 million, DOD spent $1 million on radiation detection equipment including $0.9 million for 36 pedestrian portal monitors and 100 handheld radiation detectors for one country in the former Soviet Union and $0.1 million for 100 handheld radiation detectors for another country. The $10.2 million worth of other equipment that DOD provided consisted a range of items to enable the countries to better patrol their borders, conduct searches for smuggled contraband, and equip their border posts. For example, DOD provided vans equipped with x-ray systems (but not radiation detectors) to search cargo to two countries, boats to two other countries for patrolling their coasts, and 50 contraband detection kits to another country with tools such as fiber optic scopes to search fuel tanks. See table 5 for a

breakdown of expenditures by country and category of assistance to combat nuclear smuggling.

**Table 5: Cooperative Threat Reduction Expenditures through Fiscal Year 2001**

Dollars in millions

| | Russia | Ukraine | Kazakhstan | Belarus | Georgia | Total |
|---|---|---|---|---|---|---|
| Radiation detection equipment | 0 | 0 | $0.1 | $0.9 | 0 | **$1.0** |
| Other equipment | 0 | $2.3 | 4.2 | 2.6 | $1.0 | **10.2** |
| Program management | <0 .1 | 2.1 | 0.4 | 2.2 | 0.1 | **4.8** |
| **Total** | **$<0.1** | **$4.4** | **$4.7** | **$5.7** | **$1.1** | **$16.0** |

Source: DOD.

DOD spent $10.2 million from fiscal year 1997 through 2001 on the International Counterproliferation Program to provide training and equipment to customs, border guard, and law enforcement personnel in 17 countries. The International Counterproliferation Program includes a program in cooperation with the U.S. Customs Service, which received $2.1 million from DOD to provide assistance, and another program in cooperation with the FBI, which received $1 million. The DOD/Customs program provides instruction on the detection, identification, and investigation of nuclear smuggling. The training comes with equipment packages that include radiation pagers and tools for searching persons and vehicles. The DOD/FBI program provides training and equipment with an emphasis on investigating and responding to nuclear smuggling incidents.

Also under the Cooperative Threat Reduction program, DOD spent $0.3 million to install portal monitors at three border crossings in one country in the former Soviet Union. DOE installed the equipment in cooperation with DOE's Lawrence Livermore National Laboratory, which has begun site surveys at about eight additional border crossings. Although DOD provided the same Russian portal monitors to the country that DOE is providing to Russia under the Second Line of Defense program, DOD has also worked with that country to develop an indigenous capability to manufacture and maintain portal monitors.

## U.S. Customs Service

The U.S. Customs Service, the largest recipient of funding provided by State and DOD, received a total of $44.2 million from the two agencies and spent $11.1 million from fiscal year 1993 through 2001 on assistance to combat nuclear smuggling. Specifically:

- Customs received $40.2 million from State's Export Control and Related Border Security Assistance program and spent $8.1 million from fiscal year 1999 through 2001 for equipment and training for close to 30 countries. Assistance under this program includes stationing advisors in many of the countries to help coordinate and implement assistance from all of the programs to combat nuclear smuggling.
- Customs received $0.8 million from State's Nonproliferation and Disarmament Fund and spent $0.6 million for Project Amber from fiscal year 1994 through 2001. Project Amber provided equipment and training to the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, and Slovakia. Customs also provided assistance to Cyprus and Malta with funding from the Nonproliferation and Disarmament Fund.
- Customs received $2.1 million from DOD's International Counterproliferation Program and spent $1.6 million from fiscal year 1997 through 2001 for assistance to Armenia, Azerbaijan, Bulgaria, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Romania, Slovakia, Slovenia, Turkmenistan, and Uzbekistan.
- Customs received $1.1 million from DOD's Cooperative Threat Reduction program and spent $0.7 million from fiscal year 1993 through 1999 for assistance to Belarus, Kazakhstan, Russia, and Ukraine. Customs returned $0.4 million in unspent funds to DOD.

Customs' assistance included radiation pagers that border officials wear on their belts and that can also be used as handheld devices to pinpoint the location of radioactive material that caused a portal monitor alarm. Customs provided a variety of other high- and low-tech tools ranging from very basic items such as flashlights and tools for opening containers where smuggled goods may be hidden to more sophisticated equipment such as fiber optic scopes for searching fuel tanks. Training includes operation of the x-ray vans equipped with radiation detectors; hands-on instruction in using equipment to detect nuclear smuggling; techniques for investigating smuggling operations; tracking the movements of smugglers who avoid legal border crossings by going through rugged and remote areas between ports of entry; and "train-the-trainer" courses to enable countries to train more personnel than the U.S. assistance can reach. Hands-on training includes a 2-week course at DOE's Pacific Northwest National Laboratory on interdicting smuggling of weapons of mass destruction, including nuclear materials. Officials from several countries that have received U.S. assistance told us that the training improved their border security interdiction and investigation skills and promoted better understanding of how to operate radiation detection equipment. For example, one country's border security and customs personnel told us that the U.S. Customs Service-sponsored training at Pacific Northwest National Laboratory was

particularly beneficial because it provided for "hands-on" training to detect nuclear materials hidden in vehicles. Table 6 shows a breakdown of U.S. Customs Expenditures.

**Table 6: U.S. Customs Service Expenditures, by Funding Source, through Fiscal Year 2001**

| | Funding | Expenditures | Obligations | Balance |
|---|---|---|---|---|
| State Export Control and Related Border Security Assistance | $40.2 | $8.1 | $6.3 | $25.8 |
| State Nonproliferation and Disarmament Fund | 0.8 | 0.6 | <0 .1 | 0.1 |
| DOD International Counterproliferation program | 2.1 | 1.6 | 0.2 | 0.3 |
| DOD Cooperative Threat Reduction | 1.1 | 0.7 | 0 | 0.3 |
| **Total** | **$44.2** | **$11.1** | **$6.5** | **$26.5** |

Source: U.S. Customs Service.

## U.S. Coast Guard

Through the end of fiscal year 2001, the U.S. Coast Guard received $4.4 million from the State Department Export Control and Related Border Security Assistance program and spent $1.6 million to provide assistance for maritime interdiction of nuclear smuggling to countries of the former Soviet Union. The Coast Guard used $1.5 million of that amount in one country to provide two boats with spare parts, station a Coast Guard advisor in country, and provide training. In addition, the Coast Guard provided some assistance to four countries and budgeted funds for assistance to four other countries.

## Federal Bureau of Investigation

The FBI has provided assistance to 13 countries of the former Soviet Union and Central and Eastern Europe as part of the DOD International Counterproliferation program. DOD managed the program and paid all the FBI travel expenses associated with delivering the training. The FBI's only expenditures have been for developing the curriculum for the training courses. Through fiscal year 2001, the FBI received approximately $1 million from DOD and spent $0.4 million. Until fiscal year 2001, FBI assistance consisted only of an awareness seminar for high-level government officials on weapons of mass destruction nonproliferation at the International Law Enforcement Academy in Budapest, Hungary. In fiscal year 2001, the FBI began providing additional courses with more detailed training geared toward the law enforcement officers who investigate and respond to smuggling incidents. One of the new courses,

which the DOD/FBI effort had provided only to one country as of the end of fiscal year 2001, trains law enforcement and emergency management personnel through practical exercises simulating a seizure of nuclear or other smuggled material. As part of the course, the DOD/FBI effort provides equipment packages worth $240,000 to outfit three 30-man response teams with a variety of equipment including HAZMAT suits to facilitate the safe handling of seized material, evidence collection and sampling kits, chemical detection equipment, and also radiation pagers. (The FBI originally planned to provide equipment packages worth $70,000, but it increased the amount of equipment because it received additional funding from DOD.) Other new courses that were initiated in fiscal year 2001 include crime scene management and crisis management, which trains different government agencies to work together to respond to a smuggling incident.

# Appendix III: Comments from the Department of State

United States Department of State

*Washington, D.C. 20520*

Dear Ms. Westin:

We appreciate the opportunity to review your draft report, "NUCLEAR NONPROLIFERATION: U.S. Efforts to Help Other Countries Combat Nuclear Smuggling Need Strengthened Coordination and Planning," GAO-02-426, GAO Job Code 360093.

The enclosed Department of State comments are provided for incorporation with this letter as an appendix to the final report.

If you have any questions concerning this response, please contact John Schlosser, Director, Office of Export Control Cooperation, Bureau of Non Proliferation, at (202) 647-1966.

Sincerely,

Christopher B. Burnham
Assistant Secretary and
Chief Financial Officer

Enclosure:

As stated.

cc: GAO/NRE - Ms. Gary L. Jones
State/OIG - Mr. Berman
State/NP - Mr. Van Diepen

Ms. Susan S. Westin,
Managing Director,
International Affairs and Trade,
U.S. General Accounting Office.

**Department of State**
**Comments on the GAO Draft Report**

**NUCLEAR NONPROLIFERATION: U.S. Efforts to Help Other Countries Combat Nuclear Smuggling Need Strengthened Coordination and Planning**
**(GAO-02-426, Job Code 360093)**

In general, the Department of State concurs with this report's conclusions and recommendations. The Department recognizes that inter-agency coordination and planning with regard to U.S. Government efforts to help other countries combat nuclear smuggling can be further strengthened. State is taking the lead in facilitating development of a government-wide plan for an integrated approach to the provision of detection equipment and related maintenance and support to the countries of the former Soviet Union and Central and Eastern Europe, as recommended in the report.

The Department believes, however, that the report gives insufficient weight to the progress that has been registered in the past year and a half to improve coordination and planning in this area and to address many of the technical concerns discussed in the report. These improvements were effected amid a dramatic ramping-up of the State Department's Export Control and Related Border Security (EXBS) assistance program, of which the provision of nuclear detection equipment is only a part, aimed at confronting the increased proliferation threat. (The program grew from $9 million in FY 1999 to $40 million in FY 2001.)

The Department established the Office of Export Control Cooperation and Sanctions (NP/ECS) within the Bureau of Nonproliferation in December 2000. This office was charged with, *inter alia*, implementing, managing and coordinating U.S. Government export control and related border security programs in countries aimed at stemming the proliferation of weapons of mass destruction, their delivery systems, related goods and technologies, and other weapons. In carrying out this function, NP/ECS chairs an inter-agency working group that evaluates, prioritizes, and approves projects that USG agencies propose to undertake to improve countries' export control and related border security capabilities and coordinates implementation of such projects. This working group has done much to ensure that

individual agencies' activities within the EXBS program and related to it are mutually coordinated and directed toward the accomplishment of U.S. Government foreign policy goals. Although they have their own sources of funding, the Departments of Defense and Energy regularly participate in the working group and have contributed significantly to an overall rationalization of assistance programs provided through different Congressional appropriations.

The Department has taken a number of additional steps to improve the planning and implementation of export control assistance efforts. State maintains a planning calendar for agencies' worldwide program activities in order to ensure that they are properly coordinated and completed. To implement programs in the countries of the former Soviet Union, NP/ECS works closely with the Department's Office of the Coordinator for Assistance to Europe and Eurasia to ensure that EXBS program activities are fully consistent with larger U.S. foreign policy goals and harmonized with other related U.S. assistance programs in those countries. NP/ECS also has implemented a series of measures to ensure that strict financial management controls over the EXBS program and individual agencies' activities within it are maintained and enhanced.

Similarly, the State Department independently has taken steps to improve internal coordination as well as accountability for equipment previously provided to other countries. In October 2001, NP/ECS assumed responsibility for all export control assistance functions at State including maintenance and support for radiation detection and other equipment previously provided to foreign governments by other USG programs (including another program that had been administered by the State Department), and also evaluation of host governments' employment of that equipment. The State-funded export control advisors, who keep inventory of all such equipment in 20 countries in Central, Southern and Eastern Europe and the NIS, report on its condition and use, and whether it should be repaired, upgraded or replaced. This has done much to rationalize the implementation of the assistance program in the field.

While subtantial progress has been made, the State Department believes there is more to be done to ensure a coherent, coordinated approach to the provision of radiation detection equipment to foreign governments,

taking into account the diversity of conditions, threats and levels of technical capability present in various countries that receive U.S. assistance. The Department welcomes all the recommendations in the report, and will work with other agencies to implement them.

# Appendix IV: Comments from the Department of Energy

**Department of Energy**
**National Nuclear Security Administration**
Washington, DC 20585

April 26, 2002

Ms. Gary L. Jones
Director, Natural Resources
and Environment
U. S. General Accounting Office
Washington, D.C. 20548

Dear Ms. Jones:

The General Accounting Office's draft report GAO-02-426, "NUCLEAR NONPROLIFERATION: U.S. Efforts to Help Other Countries Combat Nuclear Smuggling Need Strengthened Coordination and Planning," has been reviewed by my office. We understand that the General Accounting Office (GAO) was requested to review the National Nuclear Security Administration's (NNSA) Second Line of Defense program. Specifically, the GAO was asked to (1) identify other federal programs devoted to detecting illicit nuclear materials trafficking at country borders; (2) analyze funds received for these programs through fiscal year 2001 and future budget plans; (3) determine the level or coordination among these programs; (4) assess these programs' effectiveness; (5) identify the host countries' contributions and commitments to these programs; and (6) analyze nuclear material smuggling cases in the former Soviet Union and Central Asian republics over the past decade.

GAO has concluded that the current multiple-agency approach to providing U.S. assistance to combat nuclear smuggling is not the most effective way to deliver this assistance. Furthermore, GAO has concluded that coordination is also a problem within agencies that provide assistance. Finally, GAO has expressed concern about how U.S. equipment is being used by the recipient countries. We realize that it is difficult to assess the impact and effectiveness of the U.S.-supplied equipment unless data are routinely obtained and analyzed. We, like GAO, believe that sharing data is of critical importance to the success of the U.S. program and countries' efforts to combat nuclear smuggling.

The NNSA appreciates having had the opportunity to review this draft report. While we agree with the general findings of the report we would like to clarify that NNSA has: (1) one program to combat nuclear smuggling (the Second Line of Defense [SLD] Program) that has historically focused primarily on Russia and is now expanding to other countries; (2) one program on export control outreach (the International Export Control Program) that deals with dual-use equipment, material, and technology; and (3) a DOE work for others program (the Special

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Technologies Program now the Advanced Technologies Program) that uses Department of State funding to maintain and place radiation detectors outside of Russia.

Additionally, calculations and tests of the SLD installed monitors in Russia, that are calibrated at more sensitive levels, have proven that there is no change in the already-low false-alarm-rate of these instruments. While it is not immediately apparent from GAO's report, data and reports about non-SLD monitors indicate that they are not as sensitive to special nuclear materials, are not as reliable, and most have limited or no ability to detect shielded plutonium. While most monitors will detect strong gamma-emitting radioactive sources that could be used by terrorists for radiation dispersal devices, not all monitors are sensitive enough to detect the small signature of highly enriched uranium.

Finally, NNSA's Second Line of Defense program endorses the need for a more uniform approach to radiation monitoring at borders to combat nuclear smuggling. This is in line with its philosophical approach to providing a comprehensive systems solution to combat nuclear smuggling through the careful deployment of quality equipment, training of officials, and adequate provisions for maintenance.

Sincerely,

Kenneth E. Baker

for Linton F. Brooks
Deputy Administrator for
Defense Nuclear Nonproliferation

cc: Anthony R. Lane
Associate Administrator for
Management and Administration

# Appendix V: Comments from the U. S. Customs Service

**U.S. Customs Service**

*Memorandum*

DATE: April 25, 2002

FILE: AUD-1-OP BBS

MEMORANDUM FOR GARY L. JONES
GENERAL ACCOUNTING OFFICE

FROM: Director,
Office of Planning

SUBJECT: Draft Audit Report Entitled "Nuclear Nonproliferation: US Efforts to Combat Nuclear Smuggling Need Strengthened Coordination and Planning"

Thank you for providing us with a copy of your draft report on nuclear nonproliferation and the opportunity to discuss the issues in this report.

It is important to note that the U.S. government's non-proliferation efforts are not limited to nuclear materials, but have a wider focus and cover the entire spectrum of WMD, including chemical and biological weapons.

This report focuses on the use of technology to detect nuclear or radioactive materials. However, readers should not lose sight of the highly developed skills and experience of the individuals involved in non-proliferation efforts. Technology is only a tool in the hands of a border inspection officer, making training and procedures equally critical to a successful program.

Since U.S. Customs actually expends the lion's share (two-thirds) of all funds appropriated for these activities (see page 44), we recommend that the recommendation regarding the development of a plan by the State Department be reworded to specifically include Customs.

If you have any questions regarding these comments, please contact Ms. Brenda Brockman Smith at (202) 927-1507.

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William F. Riley

Attachment

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