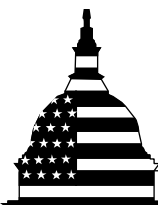


October 2012

COMBATING  
NUCLEAR  
SMUGGLING

Megaports Initiative  
Faces Funding and  
Sustainability  
Challenges



G A O

Accountability \* Integrity \* Reliability

## Why GAO Did This Study

NNSA established the Megaports Initiative in 2003 to deter, detect, and interdict nuclear or other radiological materials smuggled through foreign seaports. The Initiative funds the installation of radiation detection equipment at select seaports overseas and trains foreign personnel to use this equipment to scan shipping containers entering and leaving these seaports—regardless of destination. NNSA provides partner countries with maintenance and technical support for about 3 years, after which it transfers the equipment and all related responsibilities to partner countries. GAO was asked to examine (1) the status of the Megaports Initiative and NNSA's plans for completing and sustaining it and (2) the benefits of the Initiative and factors that reduce its effectiveness. GAO analyzed key documents; interviewed agency officials; and visited eight Megaports in five countries, selected on the basis of port size and unique characteristics, among other things.

## What GAO Recommends

GAO recommends that NNSA take actions, including (1) finalizing its long-term plan for ensuring the sustainability of Megaports operations after NNSA's final transfer of equipment to partner countries and (2) developing and maintaining useful and reliable measures to assess the performance of the Initiative. GAO also recommends that NNSA and DHS jointly assess the extent to which the two Initiatives are effectively coordinating. NNSA and DHS agreed with GAO's recommendations.

View [GAO-13-37](#). For more information, contact David Trimble at (202) 512-3841 or [trimbled@gao.gov](mailto:trimbled@gao.gov).

# COMBATING NUCLEAR SMUGGLING

## Megaports Initiative Faces Funding and Sustainability Challenges

### What GAO Found

As of August 2012, the National Nuclear Security Administration (NNSA) had completed 42 of 100 planned Megaports projects in 31 countries and, as of December 2011, NNSA had spent about \$850 million on the Megaports Initiative (Initiative). NNSA's Initiative has equipped these seaports with radiation detection equipment, established training programs for foreign personnel, and created a sustainability program to help countries operate and maintain the equipment. However, the administration's fiscal year 2013 budget proposal would reduce the Initiative's budget by about 85 percent, and NNSA plans to shift the Initiative's focus from establishing new Megaports to sustaining existing ones. As a result, NNSA has suspended ongoing negotiations and cancelled planned deployments of equipment in five countries.

Officials from the five countries GAO visited reported benefits of the Megaports Initiative, including increased capacity to interdict nuclear and radiological materials. However, GAO identified several factors that reduce the Initiative's effectiveness. For example, NNSA has not finalized a long-term plan for ensuring the sustainability of Megaports operations after NNSA transfers radiation detection equipment to partner countries. Without a long-term plan for ensuring countries' ability to continue Megaports operations, NNSA cannot be assured that its \$850 million investment will be sustained. Moreover, the Initiative's performance measures do not provide sufficient information for decision making because they do not evaluate the impact and effectiveness of the Initiative. GAO has previously reported that agencies successfully assess performance when they use measures that demonstrate results, cover multiple program priorities, and provide useful information for decision making. GAO also found that the Megaports Initiative and the Department of Homeland Security's (DHS) Container Security Initiative (CSI)—a related program that examines high-risk shipping containers for weapons of mass destruction before they are shipped to the United States—are not sufficiently coordinating. The two Initiatives are co-located at 29 foreign seaports. In two countries, DHS officials told GAO that they were using personal radiation detectors—a type of equipment intended for personal safety but not appropriate for scanning containers—to inspect containers if their radiation detection equipment is broken. However, in both countries, the Megaports Initiative had more suitable equipment that DHS officials could have used.

### Megaports Radiation Detection Equipment at Foreign Seaports



Source: GAO.

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## Abbreviations

ASP	Advanced Spectroscopic Portal
CSI	Container Security Initiative
DHS	Department of Homeland Security
DOE	Department of Energy
MRDIS	Mobile Radiation Detection and Identification System
NNSA	National Nuclear Security Administration
OMB	Office of Management and Budget
PNNL	Pacific Northwest National Laboratory
PRD	Personal Radiation Detector
RDSC	Radiation Detection Straddle Carrier
RIID	Radioisotope Identification Device
RPM	Radiation Portal Monitor
SLD	Second Line of Defense
SPM	Spectroscopic Portal Monitor

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**G A O**

Accountability \* Integrity \* Reliability

United States Government Accountability Office  
Washington, DC 20548

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October 31, 2012

The Honorable Elijah Cummings  
Ranking Member  
Committee on Oversight and Government Reform  
House of Representatives

The Honorable Edolphus Towns  
House of Representatives

Over the past decade, the United States has become increasingly concerned about the threat posed by unsecured weapon-usable nuclear material,<sup>1</sup> which could be stolen and fall into the hands of terrorists or countries seeking weapons of mass destruction. According to the International Atomic Energy Agency, from 1993 to 2011, there were 2,164 confirmed incidents of illicit trafficking in nuclear and radiological materials. Even small amounts of nuclear materials are of concern—as little as 25 kilograms of highly enriched uranium or 8 kilograms of plutonium could be placed inside containers aboard cargo ships and ultimately be used to build a nuclear weapon known as an improvised nuclear device. An improvised nuclear device could create an explosion producing extreme heat, powerful shock waves, and intense radiation that would be immediately lethal to individuals within miles of the explosion, as well as radioactive fallout over thousands of square miles. Radiological materials, such as cobalt-60, cesium-137, and strontium-90, also pose a significant security threat. These materials are used worldwide for many legitimate medical and industrial purposes. However, they could also be used by a terrorist to produce a simple and crude, but potentially dangerous weapon, known as a radiological dispersion device, or dirty bomb. Experts believe that a dirty bomb detonation could result in a limited number of deaths but that it could have severe economic, psychological, and social consequences.

Seaports are critical gateways for international commerce, and maritime shipping containers play a vital role in the movement of cargo between global trading partners. In 2009, for example, world maritime container

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<sup>1</sup>Weapon-usable nuclear materials are highly enriched uranium, uranium-233, and any plutonium containing less than 80 percent of the isotope plutonium-238. Such materials are often referred to as strategic special nuclear materials.

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traffic (loaded and empty) was estimated at over 432 million twenty-foot equivalent units.<sup>2</sup> The Department of Energy's (DOE) National Nuclear Security Administration (NNSA)<sup>3</sup> established the Megaports Initiative in 2003 so that foreign personnel at select seaports could use radiation detection equipment to scan shipping containers entering and leaving these seaports—regardless of the containers' destination—for nuclear or radiological material. The Megaports Initiative (Initiative) is implemented by NNSA's Office of the Second Line of Defense (SLD), which aims to strengthen foreign countries' capability to deter, detect, and interdict illicit smuggling of nuclear and radioactive materials across international borders. Through the Initiative, NNSA partners with foreign governments to fund the installation of radiation detection equipment at foreign seaports and train foreign personnel to operate this equipment. In some cases, partner countries also contribute funding to the design, construction, or installation of radiation detection equipment. The installed radiation detection equipment is then operated by foreign personnel. In addition, the Initiative provides maintenance and technical support for the equipment for about 3 years, after which NNSA transfers all responsibilities—including operations and maintenance of the equipment and all related financial responsibilities—to partner countries. NNSA selects seaports for participation in the Initiative using a prioritization model that ranks seaports on the basis of scannable shipping volume and threat factors, such as the origin and destination of container movement through a port and proximity to special nuclear material.<sup>4</sup>

We reported in March 2005 that the Megaports Initiative had limited success in initiating work at seaports identified as high priority.<sup>5</sup> Among

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<sup>2</sup>Twenty-foot shipping containers, referred to as a twenty-foot equivalent unit, are the industry standard, and now cargo volume and vessel capacity are commonly measured in twenty-foot equivalent units.

<sup>3</sup>NNSA was created by the National Defense Authorization Act for Fiscal Year 2000, Pub. L. No. 106-65 (1999). It is a separate semi-autonomous agency within DOE, with responsibility for the nation's nuclear weapons, nonproliferation, and naval reactors programs.

<sup>4</sup>Scannable shipping volume refers to the amount of inbound, outbound, and transshipped containers that NNSA estimates can be scanned using existing radiation detection equipment. Transshipped containers are containers that are unloaded from one ship to a seaport for a short period of time before being loaded onto another ship.

<sup>5</sup>GAO, *Preventing Nuclear Smuggling: DOE Has Made Limited Progress in Installing Radiation Detection Equipment at Highest Priority Foreign Seaports*, [GAO-05-375](#) (Washington, D.C.: Mar. 31, 2005).

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other things, we reported that it was difficult to gain the cooperation of foreign governments, in part because some countries were concerned that scanning large volumes of containers would create delays, thereby inhibiting the flow of commerce at their ports. Moreover, the Initiative did not have a comprehensive long-term plan to guide the Initiative's efforts and faced several operational and technical challenges in installing radiation detection equipment at foreign seaports. We recommended that DOE (1) develop a comprehensive long-term plan for the Initiative that identifies criteria for deciding how to strategically set priorities for establishing Megaports and (2) reevaluate cost estimates and adjust long-term projections as necessary. DOE has implemented both recommendations.

In this context, you asked us to update information on the Megaports Initiative since our 2005 report. Accordingly, we examined (1) the status of the Megaports Initiative and NNSA's plans for completing and sustaining it and (2) the benefits of the Initiative and factors, if any, that reduce its effectiveness.

For both objectives, we obtained and analyzed relevant NNSA documentation, including program plans and implementation strategies, memorandums of understanding, and cost-sharing arrangements between NNSA and partner countries, as well as sustainability plans. We interviewed NNSA officials about the status of the program, its future plans, and challenges associated with its implementation. Moreover, we interviewed contractors who help implement the Initiative at two DOE national laboratories—Pacific Northwest National Laboratory (PNNL) and Oak Ridge National Laboratory. In addition, we visited a nonprobability sample of eight seaports in five countries<sup>6</sup>—Belgium, the Dominican Republic, Jamaica, Panama, and Spain—to observe scanning operations and interview foreign government and port officials.<sup>7</sup> We selected these seaports on the basis of port size, NNSA's priority ranking, NNSA's expenditures at the port, history of cost-sharing with NNSA, length of time in the Megaports Initiative, joint presence with the Department of

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<sup>6</sup>These seaports included in Belgium: Antwerp and Zeebrugge; in Dominican Republic: Caucedo; in Jamaica: Kingston; in Panama: Balboa, Colon Container Terminal, and Manzanillo International Terminal; and in Spain: Barcelona.

<sup>7</sup>For our 2005 report, we visited Megaports in Rotterdam, the Netherlands, and Piraeus, Greece.



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Homeland Security's (DHS) Container Security Initiative (CSI),<sup>8</sup> and unique characteristics of specific locations. Because we used a nonprobability sample to select the eight Megaports we visited, the observations we made are not generalizable to other Megaports but serve as examples of challenges and concerns that may affect Megaports operations and sustainability. At the seaports visited, we interviewed foreign government officials and terminal operators using a standard set of questions about their participation in and perspective on the Megaports Initiative. We also interviewed DHS officials co-located at these seaports and U.S. embassy officials in these countries.

To assess the status of the Megaports Initiative and NNSA's plans for completing and sustaining it, we analyzed the Megaports Initiative's budget information and expenditures for fiscal years 2003 through 2012, as well as projected costs through fiscal year 2018. We interviewed knowledgeable NNSA officials to assess the reliability of the data, including the issues of data entry, access, quality control procedures, and the accuracy and completeness of the data. We determined that the data were sufficiently reliable for our purposes. We also requested and analyzed data on Megaports partner countries' cost-sharing contributions. These cost-sharing data are of undetermined reliability because we did not have a way to verify NNSA's and partner countries' estimates. We also reviewed NNSA's budget request and related budget documents for fiscal year 2013 and spoke with Office of Management and Budget (OMB) staff about proposed changes to the Megaports Initiative's fiscal year 2013 budget. To assess the benefits of the Initiative and any factors that may reduce its effectiveness, we also interviewed NNSA headquarters, PNNL, and foreign officials about the benefits and challenges they have encountered in implementing the Initiative. Additional details on our objective, scope, and methodology can be found in appendix I.

We conducted this performance audit from August 2011 to October 2012 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that

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<sup>8</sup>CSI targets and examines high-risk containers for weapons of mass destruction before they are shipped to the United States.

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the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

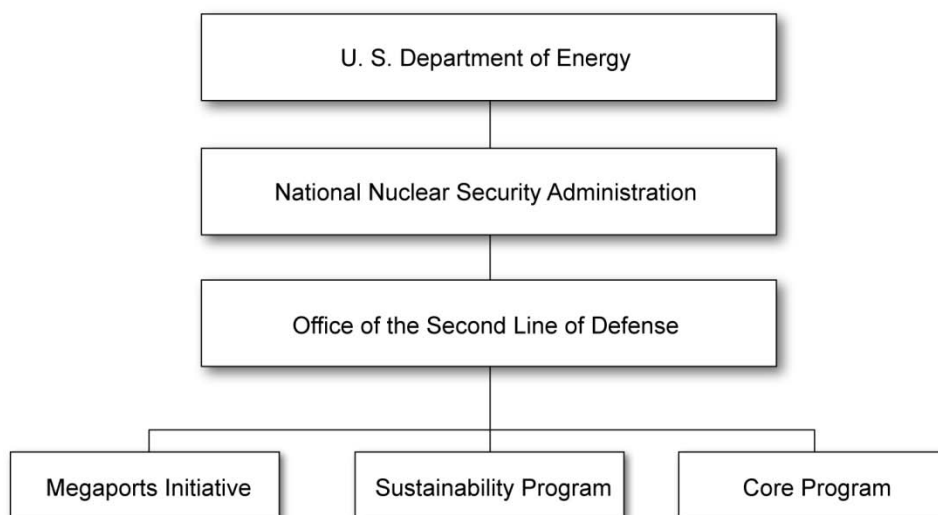
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## Background

SLD manages three programs: the Megaports Initiative, the Core Program, and the Sustainability Program. The Core Program funds the installation of radiation detection equipment at land borders, airports, and strategic seaports—primarily in Russia, other former Soviet Union countries, and Eastern Europe. The Sustainability Program supports both the Megaports Initiative and the Core Program by overseeing the transition of radiation detection equipment from NNSA to partner countries. Figure 1 shows the organization of SLD.

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**Figure 1: Organizational Structure of SLD**



Source: GAO analysis of NNSA documents.

The Megaports Initiative is part of a broader U.S. government effort to prevent terrorists from acquiring, smuggling, and using special nuclear and other radioactive materials to develop a weapon of mass destruction or a dirty bomb. The Megaports Initiative coordinates with and complements DHS's Container Security Initiative (CSI), a related program that targets and examines high-risk containers for weapons of mass destruction before they are shipped to the United States. CSI began operating in January 2002 and is active at 58 seaports around the world, including 29 seaports where the Megaports Initiative had completed Megaports as of August 2012. Under CSI, DHS places U.S. Customs and

Border Protection officials at foreign seaports to review the cargo manifests of U.S.-bound shipping containers and identify high-risk containers for scanning with nonintrusive imaging systems—which use X-rays or gamma rays to scan a container and create images of the container’s contents without opening it. In some cases, CSI officers use handheld radiation detection equipment to collect additional information about the selected shipping containers. The Megaports Initiative and the CSI programs have some similarities, but they also have key differences, which are outlined in table 1.

**Table 1: Key Attributes of the Megaports and Container Security Initiatives**

Program	Lead U.S. agency	Mission	Personnel involved	Containers scanned	Equipment used	Goal
Megaports Initiative	NNSA	NNSA funds or cost-shares the installation of radiation detection systems at select foreign seaports and trains foreign personnel to scan shipping containers for nuclear and other radioactive materials.	Foreign personnel trained by the Megaports Initiative	As many containers as possible, regardless of destination	Radiation detection equipment: radiation portal monitors and handheld detection equipment	Detect nuclear or other radioactive material
Container Security Initiative	DHS	U.S. Customs and Border Protection officials posted at foreign seaports identify high-risk shipping containers and request that foreign authorities examine the containers with nonintrusive imaging systems or physical inspections before they are loaded on vessels destined for the United States.	U.S. Customs and Border Protection officials and foreign personnel	Selected U.S.-bound containers only	Nonintrusive imaging systems and handheld radiation detection equipment	Detect potentially dangerous cargo, such as weapons of mass destruction and illicit drugs

Sources: GAO analysis of NNSA and DHS documents.

The *Megaports Initiative 2011 Program Plan* states that the Initiative has committed to providing radiation detection capability at all CSI ports, which will give CSI officials additional information in assessing high-risk containers.

SLD, numerous DOE national laboratories,<sup>9</sup> and private contractors each play a role in implementing the Megaports Initiative, as described in table 2.

**Table 2: Roles of SLD, DOE National Laboratories, and Private Contractors Involved in the Megaports Initiative**

<b>Responsible Megaports entity</b>	<b>Role</b>
NNSA's SLD	Develops the overall strategic direction and identifies the priority goals and objectives for the Initiative.
	Oversees and manages all aspects of Megaports implementation through the entire project life cycle.
Pacific Northwest National Laboratory	Provides project management, training, and sustainability support, and conducts some equipment procurements.
	Project managers oversee implementation and sustainability activities, including the scope, schedule, and budget of Megaports.
Sandia National Laboratories	Conduct site and communications surveys for new Megaports.
	Prepare design and communications requirements for new Megaports.
	Conducts testing on the communications systems that will be deployed to Megaports and leads in-country testing of entire radiation detection systems.
Los Alamos National Laboratory	Conducts background radiation survey at new Megaports. Makes technical recommendations on settings for radiation detection equipment.
	Conducts equipment testing at completed Megaports.
	Conducts laboratory-based testing on equipment and new and emerging technologies to determine detection capabilities and performance.
Oak Ridge National Laboratory	Conducts a monthly analysis of data from radiation detection equipment from operational Megaports to ensure that the equipment is functioning properly.
Small-Business U.S. Contractors <sup>a</sup>	Provide design, integration, construction, communication, and engineering expertise to support deployment of new Megaports.

Source: GAO analysis of NNSA documents.

<sup>a</sup>For each new Megaport, NNSA selects one of three preapproved contractors using a competitive bid process.

<sup>9</sup>DOE manages the largest laboratory system of its kind in the world. The mission of DOE's 22 laboratories has evolved. Originally created to design and build atomic weapons, these laboratories have since expanded to conduct research in many disciplines—from high-energy physics to advanced computing.

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The Megaports team generally implements the Initiative at foreign seaports in three phases: (1) engagement, (2) implementation, and (3) sustainability.

- *Engagement:* Before installing equipment at a seaport, NNSA and the appropriate agency in the partner country enter into an arrangement that outlines the expectations, roles, and responsibilities of all stakeholders involved. When possible, NNSA attempts to establish a cost-sharing arrangement with partner countries.
- *Implementation:* This phase involves several different activities. The Megaports team surveys the port to help plan for the installation of radiation detection equipment. Moreover, the Megaports team begins, among other things, training foreign officials on operating radiation detection equipment, resolving alarms, and maintaining this equipment. During this phase, the Megaports team also (1) hires one of three approved private contractors that will lead the construction and communications services at the new Megaport, (2) drafts a sustainability and a joint transition plan, and (3) installs and tests the radiation detection equipment and prepares the equipment for operations.
- *Sustainability:* The Megaports team works with the partner country to develop the capabilities needed to sustain equipment operations and maintenance over the long-term. For example, the Megaports Initiative funds the maintenance of equipment during this phase and conducts additional training of foreign officials. NNSA officials also regularly visit the port to ensure that the equipment is properly calibrated and being used as intended. NNSA typically transfers ownership of and responsibility for radiation detection equipment operations and maintenance to partner countries after about 3 years.

The Megaports Initiative provides partner countries with several types of radiation detection equipment that is used to scan shipping containers in primary or secondary scanning inspections. NNSA's goal is to scan as much container traffic as possible with primary radiation detection equipment—including Radiation Portal Monitors (RPM), which are large stationary systems through which cargo containers and trucks pass as they are entering or exiting the port; Mobile Radiation Detection and Identification Systems (MRDIS), which are mobile radiation detection systems that can be driven to different locations at a seaport; and Radiation Detection Straddle Carriers (RDSC), which are mobile radiation detection systems that can scan rows of containers stacked up to three

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high. These types of equipment detect both gamma and neutron radiation, which is important for detecting the presence of highly enriched uranium and plutonium. When a container is scanned with primary equipment, an alarm will sound if the equipment detects the presence of radiation. However, during primary scanning, the equipment cannot identify what type of material triggered the alarm. If they determine it is necessary, foreign customs officials will then conduct a secondary inspection with a handheld Radioisotope Identification Device (RIID) or a Spectroscopic Portal Monitor (SPM) to specifically identify the source and location of the radiation. If the foreign customs officials cannot determine the content of the container after the secondary inspection, they may manually inspect the container or request assistance from other agencies within their government. NNSA also provides partner countries with Personal Radiation Detectors (PRD), or pagers, which are small detectors that can be worn on an individual's belt to continuously monitor radiation levels in the immediate area. PRDs help to ensure personal safety. For more detailed information about and photographs of the equipment NNSA provides partner countries, see appendix II.

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## NNSA Plans to Complete 45 Megaports, but Future Implementation Is Uncertain Because of Administration-Proposed Budget Cuts

NNSA completed 42 Megaports as of August 2012 and plans to complete work at 3 additional ports by the end of fiscal year 2012, for a total of 45 Megaports at a cost of about \$850 million.<sup>10</sup> However, if proposed budget cuts are enacted, the Initiative's plans to establish new Megaports would cease. As a result, NNSA has halted the implementation of new Megaports and is working with an interagency work group to determine an appropriate future scope for the program.

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## NNSA Plans to Complete 45 Megaports and Has Spent about \$850 Million

NNSA had completed 42 Megaports as of August 2012 and plans to complete 3 additional ports by September 2012, according to NNSA officials, bringing the total to 45 operational Megaports by the end of fiscal year 2012. To ensure that countries are able to independently operate and maintain the radiation detection equipment after NNSA transfers the equipment, NNSA has (1) implemented a training program for foreign

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<sup>10</sup>NNSA had spent about \$850 million on Megaports Initiative activities as of December 2011. Unless otherwise indicated, all dollars are in 2012 constant dollars.

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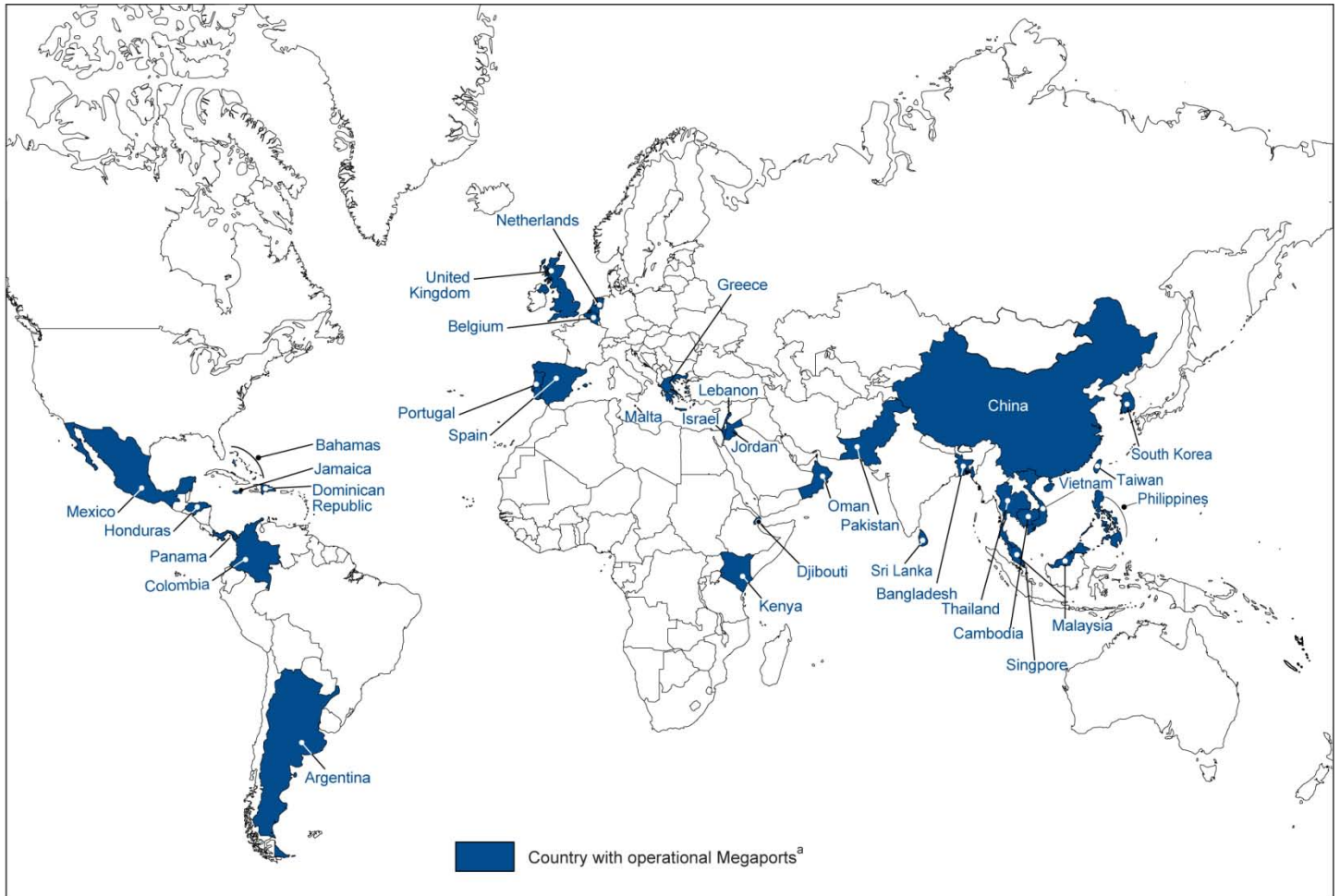
personnel operating the radiation detection equipment, (2) developed a sustainability program, and (3) developed new technology to address challenges faced at some ports. As of December 2011, NNSA had spent about \$850 million on Megaports Initiative activities.

Status of the Megaports Initiative

The 42 completed Megaports and the 3 additional Megaports that are planned for completion by September 2012 are located in 33 countries throughout Europe, Asia, Latin America, Africa, and the Middle East. Figure 2 shows the countries where NNSA has either established a Megaport or plans to have completed work for one by the end of fiscal year 2012. (See app. III for a complete list of the Megaports and information about each port.)

**Figure 2: Countries with Operational Megaports**

Instructions: Online, hover over the country names in the graphic for more information. For print version, see appendix IV.



Sources: DOE; Map Resources (map).

<sup>a</sup>DOE expects the following ports to be operational as of September 2012: (1) Buenos Aires, Argentina, (2) Port of Cebu, Philippines, (3) Cai Mep, Vietnam.



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To help decision makers identify and prioritize foreign seaports for participation in the Megaports Initiative, NNSA uses a model that ranks foreign ports according to their relative attractiveness to potential nuclear smugglers. Currently, the model scores 1,100 foreign seaports on the basis of two categories: (1) scannable shipping volume,<sup>11</sup> which accounts for 75 percent of the score, and (2) potential threat, which accounts for 25 percent of the score. Potential threat is determined on the basis of several factors, including the capabilities of terrorist groups within a country, amount of special nuclear material within a country, and the freedom of criminal groups to operate within a country. This information is then combined to provide each port with an overall score. Ports receiving higher scores are considered more attractive to a nuclear material smuggler and, therefore, of potentially higher interest for inclusion in the Initiative. The model is also updated regularly to incorporate new information. After the model produces a ranked list of ports that takes into consideration these factors and assumptions, NNSA officials work with the Department of State to ensure that U.S. diplomatic concerns are considered. For example, NNSA may not pursue ports in countries that do not have diplomatic relations with the United States.

According to our analysis of NNSA's priority list of ports, 18 of the 45 Megaports that are completed or under way (or 40 percent) are ranked lower in priority than the top 100 highest priority seaports NNSA identified. NNSA officials told us that the Initiative uses the priority list generated by the model as a targeting guide but noted that various factors affect which ports they can equip with radiation detection equipment. For example, some foreign governments with seaports identified as being of high-priority have been unwilling to participate in the Initiative because of internal political sensitivities. NNSA officials also told us that the DHS CSI ports are always added to the list regardless of ranking because of an arrangement between NNSA and DHS for the Megaports Initiative to provide radiation detection equipment at these ports. In addition, NNSA officials said that they choose some lower ranked ports if there are cost-sharing opportunities, if partner countries specifically request partnerships, or if NNSA is given an opportunity to demonstrate a new scanning approach—such as using the MRDIS to scan transshipped containers in Salalah, Oman.

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<sup>11</sup> Scannable volume refers to the estimated amount of inbound, outbound, and transshipped cargo that can be scanned utilizing existing Megaports Initiative equipment.

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The Megaports Initiative Has Implemented a Training and Sustainability Program and Developed New Technology

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We last reported on the Megaports Initiative in March 2005. At that time, NNSA had completed work on two Megaports and faced diplomatic and other impediments that limited its ability to complete more Megaports in its first 2 years.<sup>12</sup> In addition, we reported that NNSA officials faced difficulties reaching agreement with foreign countries due to political considerations outside of NNSA's control. In October 2011, NNSA officials told us they continue to face these same limitations. For example, NNSA officials said that they had been negotiating with one country's government on installing a Megaport when one of that country's citizens was killed by U.S. armed forces in Iraq. According to NNSA officials, this incident prompted that country's government to cease negotiations. After 9 months, negotiations resumed, but the progress previously made was lost, and NNSA and the officials in that country had to start negotiations over.

To ensure that countries are able to independently operate and maintain the radiation detection equipment after NNSA transfers it, PNNL implements a training program for foreign personnel operating the radiation detection equipment. PNNL officials told us that, as of December 2011, they had trained 1,038 foreign officials at DOE's Hazardous Materials Management and Emergency Response training facility in Washington State, as well as 1,521 foreign officials in their respective countries. These training courses include instruction on, among other things, operating radiation detection equipment at ports, responding to alarms generated by radiation detection equipment, using handheld instruments for secondary inspections, and maintaining the radiation detection equipment.

Through the SLD Sustainability Program, NNSA works with foreign partners to develop a joint transition and a sustainability plan that lays out actions needed at the port before NNSA transfers the equipment. These plans may include, among other things, steps for scheduled maintenance and refresher training. NNSA also provides ongoing support for the Megaports equipment through the SLD help desk managed by PNNL. The help desk provides partner countries with access to technical expertise—even after the equipment is transferred—so that they can resolve problems they may experience with the radiation detection equipment.

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<sup>12</sup>[GAO-05-375](#).

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The Megaports Initiative has developed new technologies to address transshipment challenges, as well as to improve overall scanning effectiveness and minimize the impact on seaport operations. According to the Initiative's program plan, transshipped cargo presents a significant challenge to a port's ability to scan containers because of the (1) shorter transfer time for those containers to be at the seaport before they are moved to another location or port, (2) space constraints, (3) lack of shipping data, and (4) difficulty of identifying fixed locations to place RPMs within terminals that do not impede seaport operations. To address these challenges at seaports with high transshipment volumes, NNSA developed the MRDIS and the RDSC, which are two types of mobile radiation detection equipment that can be driven to different locations within a seaport (see figs. 3 and 4). Appendix II provides additional details on these and other types of equipment used by the Megaports Initiative.

**Figure 3: Truck Driving through a Mobile Radiation Detection and Identification System**



Source: GAO.

**Figure 4: Radiation Detection Straddle Carrier Scanning Shipping Containers**



Source: GAO.

## Megaports Initiative Expenditures

As of December 2011, NNSA had spent about \$850 million on Megaports Initiative activities, according to our analysis of NNSA expenditures. Of this total, NNSA spent 64 percent, or about \$547 million, in countries where it has installed radiation detection equipment and 36 percent, or about \$303 million, on expenditures related to program integration activities, secondary equipment, and outreach to countries. (See app. V for information on the Initiative's total budget and expenditures for fiscal years 2003 through 2012.) Program integration activities include expenditures for project management, technical support, equipment testing, and equipment storage. NNSA officials told us the costs of installing equipment at individual seaports vary and are influenced by factors such as a seaport's size, its physical layout, existing infrastructure, and the type of radiation detection equipment deployed. Table 3 shows the Initiative's expenditures by country from fiscal year 2003 through December 2011. We found that the amount of money NNSA spent per country ranged from about \$1 million to \$59 million, with an average of \$16.6 million.

**Table 3: Megaports Initiative’s Expenditures by Country, Fiscal Year 2003 through December 2011**

Constant dollars in thousands

<b>Country</b>	<b>Number of operational Megaports</b>	<b>NNSA expenditures</b>
Belgium	2	\$59,307
Taiwan	1	51,973
Malaysia	2	41,511
Spain	3	34,238
Philippines <sup>a</sup>	2	29,436
Sri Lanka	1	28,188
Bahamas	1	25,500
Mexico	4	25,365
Thailand	1	19,830
Oman	1	19,154
China	1	19,078
Jordan <sup>b</sup>	1	16,879
Panama	4	16,508
Kenya	1	14,476
Bangladesh	1	13,010
United Kingdom	1	12,811
Israel	2	12,298
South Korea	1	11,571
Portugal	1	10,018
Jamaica	1	10,000
Djibouti	1	9,727
Lebanon	1	9,549
Singapore	1	9,513
Argentina <sup>a</sup>	1	8,801
Dominican Republic	1	8,290
Honduras	1	6,082
Colombia	1	5,287
Cambodia	1	5,121
Netherlands	1	4,252
Pakistan	1	3,025
Greece	1	2,988
Vietnam <sup>a</sup>	1	2,202
Malta	1	1,248

Constant dollars in thousands		
Country	Number of operational Megaports	NNSA expenditures
Additional costs <sup>c</sup>		302,550
<b>Total</b>	<b>45</b>	<b>\$849,784<sup>d</sup></b>

Source: GAO analysis of NNSA documents.

<sup>a</sup>DOE expects a new Megaport in each of these three countries to be operational as of September 2012.

<sup>b</sup>The Megaports Initiative installed equipment at four different locations in Jordan, including at one port in Aqaba and at three land border sites. NNSA considers all work in Jordan as one Megaport, and the costs listed for Jordan include the costs for all four sites.

<sup>c</sup>Additional costs include costs related to program integration activities (\$267.7 million), secondary equipment (about \$19.7 million), and outreach to countries (about \$15.2 million). Program integration activities include expenditures for project management, training, and equipment testing.

<sup>d</sup>Amounts may not total due to rounding.

## Partner Countries' Cost-Sharing Contributions

According to NNSA data, eight foreign countries have contributed an estimated \$44 million to support Megaports at 15 foreign ports (see table 4 for a list of these countries and their estimated contributions). According to NNSA, partner country cost-sharing estimates are derived from educated estimates and partner country-provided data.<sup>13</sup> Cost-sharing arrangements typically include the partner country funding the design, construction, and installation of the radiation detection equipment and NNSA providing equipment, training, and technical and maintenance support. According to the *Megaports Initiative 2011 Program Plan*, NNSA employs a formal cost-sharing approach with a partner country whenever possible. Moreover, according to the Initiative's program plan, when a partner country contributes a percentage of the cost and work to install the equipment, the country develops a greater sense of ownership for the program and contributes to the Initiative's success.

NNSA's cost-sharing estimates do not, however, include informal contributions by countries or other foreign partners, such as seaport terminal operators. Both NNSA officials and foreign partners stated that foreign partners have made contributions that were not specified in a cost-sharing arrangement. In reviewing NNSA documents, we identified at least nine instances where there were no formal cost-sharing arrangements in place, but NNSA had acknowledged informal contributions from foreign partners that could be identified as monetary

<sup>13</sup>These data are of undetermined reliability. Because these are NNSA and foreign country estimates, we did not have a way to verify this information.

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savings for the Initiative. For example, the Dominican Republic does not have a formal cost-sharing arrangement in place, but the terminal operator contributed fiber optic cables for the Megaports Initiative at the port of Caucedo, which, according to NNSA officials, contributed to monetary savings. In another case, a terminal operator in the Philippines provided power and the infrastructure for fiber optic cables to support the Initiative, which ultimately saved the Initiative both financial resources and construction time.

In December 2011, we reported that NNSA does not systematically track and verify foreign cost sharing for the Megaports Initiative and that a NNSA official told us that the Megaports Initiative cost-sharing values are estimates and are not validated or audited.<sup>14</sup> In that report, we recommended that NNSA develop ways to better track and maintain information on foreign cost sharing for nuclear nonproliferation projects overseas. NNSA neither agreed nor disagreed with this recommendation.

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<sup>14</sup>GAO, *Nuclear Nonproliferation: Action Needed to Address NNSA's Program Management and Coordination Challenges*. [GAO-12-71](#) (Washington, D.C.: Dec. 14, 2011).

**Table 4: Estimated Partner Country Cost-sharing Contributions**

Dollars in thousands

Country	Megaport	NNSA expenditures <sup>a</sup>	Estimated total partner country contributions <sup>b</sup>
Belgium	Antwerp	\$51,448	\$10,363
Belgium	Zeebrugge	7,859	7,000
China	Shanghai	19,078	256
Colombia	Cartagena	5,287	325
Israel	Ashdod	5,847	400
Israel	Haifa	6,450	1,240
Mexico	Altamira	3,909	2,400
Mexico	Lazaro Cardenas	5,268	7,100
Mexico	Manzanillo	8,713	9,560
Mexico	Veracruz	7,475	375
Panama	Manzanillo International Terminal	3,223	73
Singapore	Singapore	9,513	160
Spain	Algeciras	19,882	1,500
Spain	Barcelona	6,808	1,150
Spain	Valencia	7,548	2,170
<b>Total</b>		<b>\$168,308</b>	<b>\$44,072</b>

Source: GAO analysis of NNSA documents.

<sup>a</sup>Expenditures are from fiscal year 2003 through December 2011. Expenditures include training, project management, and sustainability. NNSA expenditures are in constant dollars.

<sup>b</sup>Cost-sharing data are from fiscal year 2003 through February 2012. Contributions listed are for those countries with formal cost-sharing arrangements with NNSA. Country contributions are not adjusted for inflation because the years of expenditures were not known.

As the table shows, Mexico, Belgium, and Spain shared the most costs with the Megaports Initiative, contributing about \$19 million, \$17 million, and \$5 million, respectively. Conversely, Panama and China contributed the least amount of funding: \$72,600 and \$256,000, respectively. In January 2007, we reported that nuclear nonproliferation is a shared responsibility and that some countries should be willing to contribute more resources to secure nuclear and radiological materials.<sup>15</sup> We

<sup>15</sup>GAO, *Nuclear Nonproliferation: DOE's International Radiological Threat Reduction Program Needs to Focus Future Efforts on Securing the Highest Priority Radiological Sources*, [GAO-07-282](#) (Washington, D.C.: Jan. 31, 2007).



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recommended that DOE develop strategies to encourage cost sharing with recipient countries. DOE stated that the recommendation was very helpful and would further strengthen its program.

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### Due to Proposed Budget Cuts, NNSA Plans to Shift the Initiative's Focus to Sustainment Rather than Expansion

NNSA had planned to establish a total of 100 Megaports by 2018, which NNSA officials told us would cost an additional \$1.26 billion.<sup>16</sup> These plans have been halted, however, because the administration's fiscal year 2013 budget proposal would reduce the SLD program budget from \$262.1 million to \$92.6 million, of which \$19.6 million would be allocated to the Megaports Initiative.<sup>17</sup> This is an 85 percent reduction for the Megaports Initiative—which had a \$132.7 million budget in fiscal year 2012.<sup>18</sup> As a result, DOE's fiscal year 2013 Congressional Budget Request states that DOE plans to shift the program's focus from establishing new Megaports to sustaining existing ones. See table 5 for a summary of SLD's budget for fiscal year 2012 and budget request for fiscal year 2013.

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<sup>16</sup>NNSA's projected costs are in current dollars.

<sup>17</sup>The other \$73.0 million would be allocated to the Core Program. As discussed above, Core Program activities include funding the installation of radiation detection equipment at land borders, airports, and strategic seaports in Russia, other former Soviet Union countries, and Eastern Europe.

<sup>18</sup>As of October 2012, Congress had passed a continuing resolution generally funding agencies at fiscal year 2012 levels through March of 2013 but had passed no full-year appropriation for DOE reflecting the proposed budget cuts. The House Committee on Appropriations, in the report accompanying H.R. 5325, an Energy and Water Development Appropriations Bill that passed the House of Representatives in April, recommended enactment of the administration-proposed budget cuts for the Megaports Initiative. The Senate Appropriations Committee, in the report accompanying S. 2465, an Energy and Water Development Appropriations Bill that has not passed the Senate, expressed concern over the proposed cuts to SLD activities, including the Megaports Initiative, and recommended an increase in funding of \$57 million for International Nuclear Materials Protection and Cooperation activities as a whole. Specifically, the Senate committee expressed the view that the budget level proposed for the Megaports Initiative would not be sufficient to sustain already deployed systems, retain expert personnel, and meet international obligations to deploy additional radiation detection equipment.

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**Table 5: SLD Budget for Fiscal Year 2012 and Budget Request for Fiscal Year 2013**

Current dollars in thousands

	Fiscal year 2012 budget enacted	Fiscal year 2013 budget request	Percentage decrease
Megaports	\$132,670	\$19,574	85.2
Core Program	\$129,402	\$73,000	43.6
<b>Total (SLD Program)</b>	<b>\$262,072</b>	<b>\$92,574</b>	<b>64.7</b>

Source: GAO analysis of NNSA documents.

NNSA has taken a number of actions as a result of proposed budget cuts, including suspending ongoing negotiations for installing Megaports in 17 countries and cancelling planned deployments of new equipment in 5 other countries. NNSA officials told us that arrangements with 2 of these countries were imminent, and the Initiative's former program manager stated that cancelling program activities would affect the agency's credibility. According to NNSA officials, it would also significantly diminish countries' trust in working with NNSA in the future. Moreover, NNSA typically funds maintenance of Megaports in transition on a yearly basis, but because of the expected budget cuts, NNSA has decided to fund maintenance contracts up to 3 years in advance of transferring the radiation detection equipment for some countries in order to honor its commitments.

The Office of Management and Budget (OMB) staff,<sup>19</sup> who examined the SLD budget as part of their role in preparing the administration's budget, cited several reasons for reducing the Megaports budget, including the following:

- *Diminishing impact:* The Megaports Initiative generally follows a prioritized scope of work for installing radiation detection equipment and has already equipped many of the world's most important seaports. As the Megaports Initiative completes the installation of new Megaports, the benefit of any significant expansion, except at certain priority sites, diminishes.

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<sup>19</sup>OMB works with the President of the United States and executive branch departments and agencies to, among other things, manage the administration's budget development each fiscal year.

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- *Questionable program effectiveness:* The technologies used in radiation detection equipment may have some limitations because they may not be able to detect nuclear or other radiological material that has been shielded or masked, and terrorists could also bypass the Megaports Initiative's equipment.<sup>20</sup>
  - *Lack of performance measures:* It is difficult to measure the Megaports Initiative's progress in achieving its mission using its existing performance measures. Specifically, the program has limited performance measures—the total number of foreign seaports where NNSA has installed radiation detection equipment and the cumulative number of Megaports with partner country cost-sharing. Moreover, NNSA does not report on what has been interdicted as a result of the Megaports Initiative, although it does internally collect this information from willing partner countries. OMB staff said that reporting the number of interdictions and what has been interdicted would be useful to help assess the Initiative's effectiveness in the future.
  - *Limited monitoring of equipment:* It is difficult for NNSA to monitor how partner countries, as sovereign nations, are using the radiation detection equipment once it transfers the equipment to a partner country.
  - *Potential duplication:* The federal government has 21 nonproliferation programs, including the Megaports Initiative. Because of the current fiscally constrained environment, OMB staff examined national security programs and identified priorities for funding according to which programs are most effective in combating nuclear smuggling. According to OMB staff, within the fiscal constraints of the *Budget Control Act of 2011*, this strategic prioritization enabled the administration to protect its highest priority nonproliferation activities, most importantly those that directly secure or remove material.

Notwithstanding the reasons they identified for reducing the Initiative's budget, OMB staff told us that there are benefits to the Megaports Initiative, such as providing a public health benefit. For example, they said that using the Megaports radiation detection equipment, countries have interdicted scrap metal contaminated with radiological material, thereby

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<sup>20</sup>Masking is the use of naturally occurring radioactive material to make the radiation emitted by smuggled material appear to be caused by innocent cargo. In contrast, shielding blocks radiation from being emitted.

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preventing it from circulating within the country or beyond its borders. Additionally, OMB staff told us that the Initiative helps deter terrorists from smuggling nuclear materials through the global shipping network. Furthermore, the Initiative has helped to build relationships with partner countries and has demonstrated the U.S. commitment to combating nuclear terrorism. OMB staff said that they weighed the program's benefits and potential repercussions from foreign partners resulting from NNSA's cancellation of arrangements. However, they determined that the Initiative could not demonstrate that further expansion would have a significant impact on preventing nuclear or radiological materials from entering the United States.

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### Interagency Group Has Been Established to Review Megaports Initiative's Future Role

The administration's fiscal year 2013 budget proposes that NNSA, in coordination with members of an interagency work group, conduct a strategic review of SLD—including the Megaports Initiative—to determine an appropriate future scope for the Initiative and how it may affect other national security programs. NNSA officials told us that the interagency work group is led by the White House National Security Staff and includes officials from DHS's Domestic Nuclear Detection Office, the Department of State, the Department of Defense, and the National Counterterrorism Center.

According to NNSA officials and OMB staff, NNSA is continuing its strategic review of the Megaports Initiative to ensure that the Initiative, under a constrained budget environment, is most effectively and efficiently detecting, deterring, and interdicting nuclear and radiological material. Through its strategic review, NNSA is assessing how to best leverage and sustain existing capabilities, and whether installing additional radiation detection systems at strategically selected ports is warranted to further strengthen detection and deterrence at key hubs and spokes in the global maritime shipping network. The strategic review is assessing the threat of terrorists shipping nuclear materials through the maritime shipping network. NNSA's strategic review also includes an assessment of the Megaports Initiative's port prioritization methodology, in which NNSA updated its model with 2011 data. To generate a list of ports that would be realistic for consideration if expansion is warranted, NNSA is also considering additional factors, including a country's likelihood of entering into an arrangement, the type of equipment appropriate for each port, cost-sharing arrangements, and whether a country participates in other nuclear nonproliferation programs. According to NNSA's strategic review, through technical exchanges, the Megaports Initiative could provide assistance with technical aspects of the project

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involving the transfer of knowledge only. The results of the strategic review will be reflected in the fiscal year 2014 budget.

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### Countries Cite Benefits of the Megaports Initiative, but Several Factors Limit Its Effectiveness

Foreign officials from countries that we visited reported benefits of the Megaports Initiative, such as gaining a greater capacity to interdict radiological materials, but we also identified several factors that reduce the Initiative's effectiveness. These factors include partner countries that are not fully using radiation detection equipment or fully participating in the Initiative. The program also faces several management weaknesses, including having insufficient performance measures and limited testing of spectroscopic portal monitors and deployment of radiation detection equipment.

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### Benefits of the Megaports Initiative Cited by Partner Countries

Foreign officials from the five countries we visited highlighted several benefits of the Megaports Initiative. For example, foreign government officials from four countries—Belgium, the Dominican Republic, Jamaica, and Spain—told us that the Initiative has helped their respective countries interdict radiological materials found in containers using the Megaports radiation detection equipment. For example, Spanish customs officials told us that they interdicted medical isotopes that had not been properly disposed of, and Jamaican officials told us that they interdicted contaminated scrap metal.<sup>21</sup> Moreover, officials from these four countries also told us that the radiation scanning equipment was used to ensure that goods imported from Japan were not contaminated in the wake of the 2011 Fukushima Daiichi nuclear incident. For example, Belgian customs officials told us that they interdicted 15 containers contaminated with radioactive material originating from Japan. In addition, according to foreign government officials, as part of the Initiative, NNSA officials helped both Jamaica and Spain develop a response plan in the event that their officials interdict nuclear or radiological material. Jamaican officials told us that seven different government agencies play a role in responding to a radioactive emergency and that the centralized response plan will help them better coordinate a response if they interdict radiological materials.

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<sup>21</sup>Medical isotopes are used to treat cancer or conduct medical diagnoses.

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NNSA officials also identified other program benefits. For example, according to NNSA officials, 13 countries with Megaports have reported about 155 interdictions of radiological materials. In addition, 19 countries have taken steps to supplement, or have expressed interest in supplementing, the Megaports Initiative by acquiring their own radiation detection equipment. According to the Initiative's program plan, based on the success of Megaports Initiative in the Netherlands, the Dutch government replaced four U.S.-provided RPM units with more than 40 RPMs at that country's expense to be able to scan all imports and exports at the Port of Rotterdam—which is the largest seaport in Europe. Spanish customs officials also told us that the Initiative provided a foundation for beginning radiation detection scanning in Spain. Spanish customs purchased handheld radiation detection equipment to use in airports and scanning equipment for six other seaports after the Fukushima accident.

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### Several Factors Have Impeded the Initiative's Effectiveness

Notwithstanding these benefits, we identified several factors that reduce the Initiative's effectiveness. Specifically, some partner countries are not fully using radiation detection equipment, and some foreign partners are not fully participating in the Initiative.

#### Some Partner Countries Not Fully Using Radiation Detection Equipment

In four of the five countries we visited—and seven of the eight seaports—countries were using the Megaports-funded secondary radiation detection equipment on a limited basis, and foreign officials told us that they are conducting secondary scanning for a small percentage of the containers that triggered an initial alarm. For example, customs officials from one country that we visited told us that they limit the containers that they refer for secondary scanning because they want to minimize interruptions to port operations. According to these officials, the day before we visited in January 2012, they referred one container for secondary scanning out of 17 containers that triggered alarms during primary scanning. Customs officials from this country select containers for secondary scanning by comparing the initial alarm information with a container's shipping information. For example, the shipping information should indicate what cargo the container holds, and on the basis of the information, officials assess whether that cargo naturally emits radiation.<sup>22</sup> If the shipping information matches the alarm information, they allow the container to

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<sup>22</sup>Natural sources of radiation, which are usually harmless, occur in a wide variety of common items and consumer goods, such as fertilizer, bananas, and ceramic tiles.

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proceed. Similarly, customs officials in another country we visited stated that if a container triggers a primary alarm, they compare the container's shipping information with the alarm information to determine whether the container should be scanned by secondary equipment. According to the *Megaports Initiative 2011 Program Plan*, one port in this country scans about 73 percent of containers with primary equipment; however, foreign officials from this port said that they conduct secondary scanning for only a small number of containers—about 2 to 3 containers per day out of about 200 primary alarms. (See fig. 5 for a photograph of a SPM radiation detection scanning unit, which is used for secondary scanning.)

**Figure 5: A Spectroscopic Portal Monitor Used for Secondary Radiation Detection Scanning**



Source: GAO.

The Megaports Initiative encourages partner countries to conduct as many secondary inspections as possible, according to NNSA officials. However, NNSA officials also told us that they recognize that there are practical challenges to conducting secondary inspections on 100 percent of containers that trigger a primary alarm. For example, the flow of

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commerce may be affected when a truck is diverted from its normal route to a secondary inspection area or because of the time that it takes to conduct a secondary inspection. As a result, NNSA trains partner countries to set priorities for selecting containers for secondary inspection by assessing a container's shipping information, including, among other things, the commodity being shipped, the shipper, and the country of origin and destination.

In contrast, at U.S. ports of entry, 100 percent of containers that produce an initial alarm must be verified with more precise secondary scanning equipment, according to DHS guidance. DHS officials, who manage the domestic radiation detection program, told us that secondary scanning is important to reduce the risk that containers may be masking or shielding nuclear material. In addition, the *Megaports Initiative 2011 Program Plan* states that, although RPMs are the most sensitive radiation detection technology deployed by the Megaports Initiative, they do not have the ability to unambiguously characterize the location, distribution, and identity of a radiation source in a container that triggers an alarm. The program plan also states that this type of information is determined by a secondary inspection. Furthermore, a senior official for a global terminal operator told us that it is "very easy" for exporters to lie about the contents of a shipping container. According to this official, smugglers could also place materials into a container after it leaves an exporter's facilities, and the container's shipping information would still appear to be legitimate.

#### Some Megaports Partner Countries Not Fully Participating in the Initiative

Some partner countries are not fully participating in the Megaports Initiative, which raises questions about their long-term commitment to the Initiative and may compromise the security gains expected. For example, Panamanian customs officials—who expressed support for the Initiative—told us that the four Megaports in Panama currently scan less than 1 percent of their container traffic, but terminal operators at two Megaports in Panama stated that they are not willing to conduct additional scanning because they do not believe there are economic benefits to participating in the Initiative. Panamanian customs officials told us that about 85 percent of containers passing through the Panama Canal are transshipped containers. According to the Initiative's program plan, it is difficult to scan transshipped containers because of space and operational constraints. NNSA officials told us that they plan to add a MRDIS unit—a type of mobile radiation detection equipment—to one of the Megaports in Panama to help increase the volume of containers scanned. However, a senior official for the terminal operator at this port told us that they have not yet agreed to the placement of the MRDIS and are concerned about it delaying port operations. Panamanian customs



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officials told us that a nuclear or radiological incident affecting the Panama Canal would take years to clean up and would cause worldwide economic chaos.

Other Megaports partners are also not fully participating in the Megaports Initiative. For example, the Chinese government has agreed to install radiation detection scanning equipment at one port. However, 12 Chinese seaports are ranked in the top 100 highest priority ports, according to NNSA's port prioritization model. NNSA officials told us that they have discussed installing radiation detection equipment at additional seaports in China with Chinese officials, but that future cooperation is uncertain because of the proposed decreases to the Initiative's budget. In addition, China is one of the few countries that does not share scanning data with the Initiative because, according to NNSA officials, the Chinese government believes that trade information contained in the data is proprietary. Oak Ridge National Laboratory analyzes scanning data for Megaports countries on a monthly basis to assess, among other things, whether the monitors are installed and working properly, as well as to collect information on alarm rates and the number of containers scanned. Furthermore, DOE laboratory officials told us that the Chinese government has agreed to scan only exports—not imports, which most other Megaports scan—and required NNSA to purchase Chinese radiation detection equipment instead of U.S. equipment. The Initiative tested the Chinese radiation detection equipment in 2006 with a budget of \$180,000 to certify it as reliable for use. In addition, Pakistan—a country of significant nonproliferation concern—has not agreed to install equipment at more than one seaport. NNSA officials told us that they began negotiating in 2006 to expand the program in Pakistan.

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### Management Weaknesses Impede the Initiative's Effectiveness

We also identified several management weaknesses that reduce the Initiative's effectiveness. Specifically, we have concerns that NNSA (1) has not finalized a long-term plan for ensuring the Initiative's sustainability, (2) does not have sufficient performance measures, and (3) has performed limited testing and deployment of SPM radiation detection equipment. In addition, we found limited coordination between the Megaports Initiative and the Container Security Initiative (CSI), which is implemented by DHS.

### NNSA Has Not Finalized a Long-Term Plan for Ensuring the Initiative's Sustainability

NNSA has taken steps to help partner countries prepare to take responsibility for Megaports operations after NNSA transfers the equipment to them. However, NNSA does not have a long-term plan for ensuring the ongoing sustainability of these Megaports operations. For

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example, NNSA is not systematically following up with partner countries to ensure that they are effectively operating and maintaining Megaports-funded equipment after NNSA's final transfer of equipment, maintenance, and related financial responsibilities. According to the Initiative's program plan, it is "critical" that the installed systems are appropriately overseen to help counter possible corruption and to ensure that the systems are being used as intended. During a July 2012 meeting with senior officials for the Megaports Initiative, we discussed whether the Initiative had a long-term sustainability plan. After that meeting, NNSA officials provided us with a draft sustainability plan, which addresses how SLD will engage partner countries after the final transfer of radiation detection equipment. For example, the plan states that the Sustainability Program will use a list of metrics to assess how well a country is maintaining its capacity to sustain Megaports operations and that SLD will provide narrowly tailored support to partner countries, if needed, to ensure continued sustainability of operations. For example, SLD might provide technical advice, analyze RPM scanning data, or provide help desk support. According to the Initiative's acting program manager, NNSA plans to finalize this plan in October 2012.

We also found that several impediments could compromise the sustainability of Megaports operations. According to NNSA officials, several countries—including Bangladesh, Djibouti, and Kenya—will likely require ongoing assistance at the end of their 3-year transition periods. Other countries, including Sri Lanka and Colombia, have requested extensions to their 3-year sustainability period, and NNSA officials expect that additional training will be needed to fully transfer Megaports operations to Pakistan. Officials in two countries we visited—the Dominican Republic and Panama—reported concerns about funding the operations and maintenance of Megaports equipment after NNSA transfers responsibility. Furthermore, officials in the five countries we visited reported staffing challenges, including recruiting, retaining, and funding staff who operate Megaports equipment and respond to alarms. For example, CSI officials in one Caribbean country told us that they observed staffing shortages among the partner country's customs officials who work on the Megaports Initiative and that alarms for Megaports RPMs periodically go off for several hours to a week without a response from local customs officials. According to NNSA officials, the partner country has taken steps to resolve these staffing issues by hiring a new lead Megaports officer and new Megaports employees who are to be trained in September 2012. However, a senior official who works for a global terminal operator told us that he is not confident that countries will continue operating the Megaports equipment if the Initiative is eliminated

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Performance Measures Are Not Sufficient

because these countries would not have any diplomatic or economic incentives to continue scanning containers. In fact, this official said that this global terminal operator has already begun looking into the costs of removing radiation scanning equipment in case some governments decide not to continue Megaports operations.

Performance measures are important to ensure that NNSA can evaluate the Initiative's effectiveness and progress. We have previously reported that agencies successfully assess performance when they use measures that demonstrate results, cover multiple program priorities, and provide useful information for decision making.<sup>23</sup> According to DOE's *Fiscal Year 2011 Annual Performance Report*, NNSA has two performance measures for the Initiative—the total number of foreign seaports where it has installed radiation detection equipment and the cumulative number of Megaports with partner country cost-sharing.

These two performance measures, however, have limitations and do not provide sufficient information for decision making. For example, using the number of foreign seaports where the Initiative has installed radiation detection equipment as a key performance measure does not evaluate the impact and effectiveness of the Initiative. This measure does not, for example, demonstrate whether the equipment is effective, account for the volume of containers being scanned, or indicate whether countries are continuing to use the equipment. As of August 2012, NNSA reported having 42 operational Megaports, but NNSA decommissioned 1 of those Megaports—Southampton in the United Kingdom—in June 2010. In addition, Panamanian customs officials told us that the four Megaports in Panama currently scan less than 1 percent of their container traffic. As such, this performance measure does not provide NNSA decision-makers with adequate information to assess the extent to which the Initiative is fulfilling its mission to deter, detect, and interdict the illicit trafficking of special nuclear and other radioactive materials in the global maritime system.

Furthermore, using the cumulative number of Megaports with country cost-sharing as a measure of the Initiative's performance is not reliable because, as we reported in December 2011, NNSA does not

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<sup>23</sup>GAO, *Executive Guide: Effectively Implementing the Government Performance and Results Act*, [GAO/GGD-96-118](#) (Washington, D.C.: June 1, 1996).

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Limited Testing and  
Deployment of Radiation  
Detection Equipment

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systematically track and verify foreign cost-sharing for the Megaports Initiative, and these estimates are neither validated nor audited.<sup>24</sup> NNSA officials told us that they do not have the authority to audit countries' cost-sharing estimates. In our December 2011 report, we noted that NNSA officials told us that this performance measure was difficult to quantify and that it would be eliminated for fiscal year 2012 as a result of a DOE "performance measures streamlining initiative."

According to a 2011 House Committee on Appropriations report, the committee is concerned that the Initiative's performance measures are not adequate to assess the effectiveness of SLD's activities, and the report states, "the true effectiveness of [radiation] detectors in preventing proliferation is largely dependent on how well individual countries employ these capabilities in their security operations."<sup>25</sup> OMB staff also told us that it is difficult to measure the Megaports Initiative's outcomes because of its limited performance measures and said that the Initiative does not routinely report what materials it has successfully interdicted.

In February 2012, we met with senior NNSA program officials to discuss the status of the Megaports Initiative. These officials told us that the Initiative's current performance measures are insufficient and that they need to develop more effective and useful metrics. For example, NNSA officials told us that one of the primary benefits of the Initiative is deterring terrorists from smuggling nuclear or radiological materials through seaports, but it is difficult to measure the deterrent value of the Initiative.

We identified numerous issues related to NNSA's plans for deploying radiation detection equipment. According to the Initiative's *Alternative Detection Technology Strategy*, SLD acquired 44 SPM units in total—12 purchased by NNSA in 2006 and 32 given to NNSA by DHS in 2010 and 2011.<sup>26</sup> We have reported several times over the last 6 years that SPM technology—also known as advanced spectroscopic portals (ASP)—is

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<sup>24</sup>[GAO-12-71](#).

<sup>25</sup>H.R. Rep. No. 112-118 at 137 (accompanying H.R. 2354, Energy and Water Development Appropriations Bill, 2012).

<sup>26</sup>According to NNSA, in 2006 the average cost of an SPM unit was about \$600,000.

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not proven.<sup>27</sup> One of the principal findings of our past work reviewing DHS's efforts to develop and procure ASPs was that initial testing was not rigorous enough. Once the testing became more rigorous, ASPs did not perform well enough to warrant development, and the DHS program was subsequently canceled. NNSA officials told us that, after receiving the ASPs from DHS, they changed the name of the equipment to SPMs to avoid the negative connotations associated with the ASP program. NNSA officials also said that they viewed the receipt of the SPMs as an opportunity to test and evaluate this type of technology exclusively for secondary scanning purposes at an actual seaport. However, we visited one foreign seaport where NNSA had deployed an SPM, but the unit was getting limited use as a secondary inspection tool. Local customs officials in this country told us that they only use the SPM about two to three times per day, even though the primary radiation detection equipment triggers about 200 alarms each day.

The Megaports Initiative planned to spend \$8.9 million to test and evaluate radiation detection equipment from fiscal years 2006 through 2011, including about \$5.2 million for SPM technology. NNSA officials told us that the Initiative does not have a dedicated budget for testing and evaluating radiation detection equipment because the program does not have a technology development mission. However, NNSA also has a program office—the Office of Nonproliferation Research and Development—that, among other things, conducts research, development, and testing of new technologies to improve U.S. capabilities to detect nuclear weapon-usable materials. This office's Proliferation Detection program has an annual budget of more than \$200 million, which conducts research and provides technical expertise on next-generation detection capabilities for nuclear materials.

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<sup>27</sup>In prior reports, we have questioned DHS's plans to deploy spectroscopic technology to scan cargo at ports of entry because (1) DHS's cost analysis of the ASP program was not sound and (2) DHS did not fully disclose the limitations of the technology's test results. In February 2010, DHS announced that it was scaling back its plan for development and use of this technology. See, for example: GAO, *Combating Nuclear Smuggling: Lessons Learned from DHS Testing of Advanced Radiation Detection Portal Monitors*, [GAO-09-804T](#) (Washington, D.C.: June 25, 2009); GAO, *Combating Nuclear Smuggling: DHS's Phase 3 Test Report on Advanced Portal Monitors Does Not Fully Disclose the Limitations of the Test Results*, [GAO-08-979](#) (Washington, D.C.: Sept. 30, 2008); and GAO, *Combating Nuclear Smuggling: DHS has Developed Plans for Its Global Nuclear Detection Architecture, but Challenges Remain in Deploying Equipment*, [GAO-12-941T](#) (Washington, D.C., July 26, 2012).

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Moreover, the Megaports Initiative has not deployed a significant amount of the equipment for testing, as evidenced by its storing unused radiation detection equipment at a total cost of about \$1.3 million each year in both 2010 and 2011.<sup>28</sup> NNSA officials told us that, as of February 2012, NNSA had deployed only 16 of the 44 SPMs to foreign seaports and DOE national laboratories. The agency has not deployed any SPMs to Core Program land border sites. NNSA placed the remaining 28 units in storage along with other types of equipment. In August 2012, the Megaports program manager told us that they were looking into options for removing this equipment from storage by, for example, giving some of the equipment to partner countries or by removing usable components and declaring the rest as surplus inventory.

In addition, in 2008, NNSA purchased a new type of radiation detection equipment—four RDSCs at a total cost of about \$18 million—but two of the units are not currently being used. According to NNSA officials, the Initiative purchased these two units with the intention of deploying one to Taiwan and giving one to DHS to address a scanning challenge at a U.S. seaport. However, the Taiwanese port was reconfigured, and the new layout was no longer suitable for using the RDSC. Moreover, DHS decided that it did not want to use the RDSC after conducting an alternatives analysis because DHS did not consider the RDSC to be a viable system suitable for use by U.S. Customs and Border Protection.<sup>29</sup> NNSA considered deploying one of the RDSCs to a port in Italy, but that port lost a major shipping client and decided to reconfigure the port in a way that would eliminate use of straddle carriers. As a result, NNSA is spending an additional \$33,000 in 2012 on storage fees for these two idle RDSCs while NNSA officials explore other options for deploying them.

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<sup>28</sup>According to the Initiative's former program manager, the Megaports Initiative and the Core Program each pay half of these costs.

<sup>29</sup>According to DHS officials, the department was undergoing an alternatives analysis for the on-dock rail program, in which the RDSC was one of the alternatives. DHS decided not to take the RDSC until the alternatives analysis was concluded and only if the RDSC was determined to be a viable alternative. Through its analysis, DHS determined there were cost and sustainability issues associated with the RDSC—including high acquisition, operations, and maintenance costs, as well as costs associated with paying RDSC drivers. DHS officials also said that U.S. Customs and Border Protection has since developed cost-sharing initiatives with its stakeholders, which may allow the RDSC to become a viable scanning solution.

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Limited Coordination between  
Megaports and CSI

The *Megaports Initiative 2011 Program Plan* states that the Initiative has committed to providing radiation detection capability at all CSI ports, which will give CSI additional information in assessing the security risks of maritime containers. (See fig. 6 for a photograph of CSI's nonintrusive imaging system and the Megaports Initiative's radiation detection scanning equipment at a Megaport.) From 2005 through 2008, DOE and DHS signed eight joint declarations of principles with partner countries for eight Megaports to establish coordination on enhancing the security of cargo containers. NNSA officials told us that they provide CSI officials, who are co-located with Megaports, with access to alarm information and that the CSI officials are invited to participate in Megaports training.

**Figure 6: CSI Nonintrusive Imaging System Next to the Megaports Initiative's Radiation Detection Scanning Equipment**



Source: GAO.

However, we found two cases at ports in the Caribbean where the Megaports Initiative and CSI programs were co-located but were not coordinating their efforts to scan containers. DOE and DHS signed joint declarations of principles with the local customs offices in both of these

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countries. In both countries, CSI officials told us that they use their personal radiation detectors—a type of equipment intended for personal safety but not appropriate for scanning containers—to inspect containers if their primary detection equipment is broken. However, in both countries, the Megaports Initiative had functioning RPMs and handheld radiation detection equipment that, according to the Megaports Initiative’s former program manager, CSI officials could have used if they had asked Megaports equipment operators. In addition, CSI officials in one of these countries—who work in a room adjacent to Megaports equipment operators—told us that they periodically observed Megaports alarms going off for several hours to a week without answer. CSI officials told us that they eventually became “annoyed” by the alarms and called the partner country’s customs office to report the issue. Moreover, CSI officials said that they do not know if the containers that triggered the alarms were eventually inspected. CSI officials’ reluctance to resolve the alarms or contact NNSA officials about this issue raises questions about whether NNSA and DHS are leveraging resources of these two U.S. programs with similar missions.

In an October 2005 report on practices that can help enhance and sustain collaboration among federal agencies, we stated that a focus on results, as envisioned by the Government Performance and Results Act of 1993, implies that federal programs contributing to the same or similar results should collaborate to ensure that goals are consistent and, as appropriate, program efforts are mutually reinforcing. As we reported, agencies can enhance and sustain collaborative efforts by identifying and addressing needs by leveraging resources to support the common outcome.<sup>30</sup> It is unclear to what extent NNSA and DHS are coordinating or collaborating at other seaports where they are co-located to ensure that their program efforts are mutually reinforcing as envisioned by the Government Performance and Results Act.

Furthermore, NNSA and DHS have entered into joint arrangements with partner countries, but the two agencies do not have written policies or procedures on how to coordinate their activities at ports to best leverage their resources. Without written procedures, the two initiatives may not be taking advantage of an opportunity to more effectively implement their

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<sup>30</sup>GAO, *Results-Oriented Government: Practices That Can Help Enhance and Sustain Collaboration among Federal Agencies*, [GAO-06-15](#) (Washington, D.C.: Oct. 21, 2005).



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mutual goal of combating nuclear smuggling overseas. In June 2010, we reported that agencies can strengthen their commitment to work collaboratively by articulating their roles and responsibilities in formal documents to facilitate decision making.<sup>31</sup> Such formal documents can include memorandums of understanding, interagency guidance, or interagency planning documents, signed by senior officials in the respective agencies.

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## Conclusions

Under its Megaports Initiative, NNSA has installed radiation detection equipment at more than 40 foreign seaports since 2003 and has trained foreign personnel in partner countries to scan shipping containers entering and leaving these seaports—regardless of the containers’ destination—for nuclear or radiological material. However, recent proposed budget cuts have created an uncertain future for the Megaports Initiative. NNSA is working with an interagency work group to evaluate the Megaports Initiative and adjust future plans accordingly. This evaluation and adjustment period provides NNSA with an opportunity to address management weaknesses that we identified during the course of our review and seek to maximize the effectiveness and efficiency of the Initiative whatever its construct in the future.

We found that several Megaports partner countries have not entered into a formal cost-sharing arrangement with NNSA but nonetheless have made contributions to the Initiative. However, NNSA is not systematically tracking information on the amount of funding or other contributions that partner countries informally contribute to the Initiative. We continue to believe that our previous recommendation—that NNSA develop better ways to track and maintain information on foreign cost-sharing—could, if implemented, provide a tangible measure of foreign governments’ commitment to NNSA’s nuclear nonproliferation programs.

NNSA has not finalized a long-term plan for ensuring the sustainability of Megaports operations after NNSA transfers all equipment maintenance, operations, and related financial responsibilities to partner countries. As we found, several countries have raised concerns about funding the

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<sup>31</sup>GAO, *National Security: Key Challenges and Solutions to Strengthen Interagency Collaboration*, [GAO-10-822T](#) (Washington, D.C.: June 9, 2010) and GAO, *Live Animal Imports: Agencies Need Better Collaboration to Reduce the Risk of Animal-Related Diseases*, [GAO-11-9](#) (Washington, D.C.: Nov. 8, 2010).

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operations and maintenance of Megaports equipment after the United States transfers responsibility. Without a plan in place to ensure the sustainability of Megaports operations in the future, NNSA cannot be confident that this equipment will continue to be used for the purposes intended or if it will be used at all.

NNSA has also not developed performance measures that sufficiently demonstrate the extent to which the Megaports Initiative is effectively fulfilling its mission to deter, detect, and interdict the illicit trafficking of special nuclear and other radioactive materials in the global maritime system. Its current measures of performance—the total number of foreign seaports where NNSA has installed radiation detection equipment and the cumulative number of Megaports with partner country cost-sharing—are not useful or reliable for decision making. Specifically, these measures do not demonstrate whether the equipment is effective, account for the volume of containers being scanned, or indicate whether countries are continuing to use the equipment. As a result, NNSA decision makers and policymakers do not have the necessary information to assess the nonproliferation and deterrent benefits of the Initiative. Without meaningful performance measures, it is difficult to measure the Megaports Initiative's outcomes, which may have contributed to the administration's proposed budget cuts to it.

We found that the Megaports Initiative has planned more than \$5 million in spending to test and evaluate SPM radiation detection equipment, which we previously reported is an unproven technology. The Megaports Initiative also does not have a technology development mission; whereas, another NNSA program office does have a mission specifically dedicated to testing and evaluating radiation detection equipment. As a result, we question whether this is an appropriate investment of the Initiative's limited funding, particularly given its uncertain future.

Furthermore, NNSA has not deployed a significant amount of the Megaports Initiative's equipment, as evidenced by the more than \$1 million SLD spent in both 2010 and 2011 to store radiation detection scanning equipment—including SPMs and other equipment—that it was unable to install in foreign countries—either through the Megaports Initiative or at Core Program land border sites. As of the time of our review, NNSA officials had not taken steps to remove the remaining 28 SPMs and 2 RDSCs from storage, although they are considering options to do so. Without deploying this equipment for the intended purposes, providing it to other NNSA or DOE offices for research and further testing, or declaring the equipment as surplus inventory, NNSA will continue

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spending the Initiative's limited resources to store idle equipment, even as the Initiative expects significant budget cuts in fiscal year 2013.

Finally, the *Megaports Initiative 2011 Program Plan* states that the Initiative has committed to providing radiation detection capability at all CSI ports, but we found that NNSA and DHS have engaged in limited coordination at two seaports that we visited where the Megaports Initiative and CSI are co-located. CSI officials in two countries told us that they were using personal radiation detectors—which is a type of equipment intended for personal safety but not appropriate for scanning containers—to scan containers, while more appropriate radiation detection equipment that the Megaports Initiative has provided its partners is located at the same port. It is unclear to what extent NNSA and DHS are coordinating or collaborating at other seaports where they are co-located to ensure that their program efforts are mutually reinforcing as envisioned by the Government Performance and Results Act or how localized the problem is. However, while NNSA and DHS have signed joint arrangements with some partner countries, the two agencies do not have written policies or procedures on how to coordinate at ports to best leverage their resources. Without such written procedures, the Megaports Initiative and CSI may not be taking advantage of an opportunity to more effectively combat nuclear smuggling overseas.

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## Recommendations for Executive Action

We are making the following five recommendations.

To ensure that the Megaports Initiative is maximizing resources and protecting its investments of \$850 million, we recommend that the Administrator of the National Nuclear Security Administration take the following four actions:

- Finalize its draft sustainability plan for ensuring ongoing sustainability of Megaports operations after NNSA transfers all equipment, maintenance, operations, and related financial responsibilities to partner countries.
- Develop and maintain useful and reliable measures to assess the performance of the Megaports Initiative. These measures might include the number and type of interdictions, percentage of global maritime container traffic scanned, or length of time that countries sustain operations of the Megaports equipment.

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- Terminate additional expenditures from the Megaports Initiative’s budget for testing and evaluating SPMs. Additional testing and evaluation activities, if warranted, should be funded through other NNSA programs with a research and development mission.
  - Remove unused Megaports radiation detection equipment—particularly SPMs and RDSCs—from storage on an expedited basis. This could be done, for example, by (1) providing the equipment to DOE national laboratories for research and further testing or (2) declaring the equipment as surplus inventory.

To strengthen efforts to combat nuclear smuggling overseas, we also recommend that the Administrator of the National Nuclear Security Administration and the Secretary of Homeland Security take the following action:

- On a periodic basis, jointly assess the extent to which the Megaports Initiative and CSI are effectively leveraging resources and coordinating at foreign seaports where the two Initiatives are co-located. If the agencies determine based on these joint assessments that there is a need for increased coordination, they should develop written policies or procedures that formally document how to coordinate at ports to best leverage their resources.

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## Agency Comments and Our Evaluation

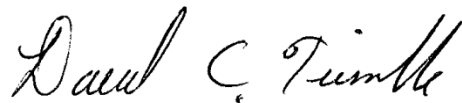
We provided the Departments of Energy and Homeland Security and the Office of Management and Budget a draft of this report for their review and comment. In written comments, DOE and DHS agreed with our recommendations; their comments on the draft report are presented in appendixes VI and VII, respectively. DOE and DHS also provided technical comments, which we incorporated as appropriate. On October 3, 2012, we received oral comments from OMB staff, including an OMB branch chief, a program examiner, and staff from the Office of General Counsel. These staff agreed with the facts presented in this report and stated that they concurred with our findings and recommendations. In addition, OMB provided technical comments, which we incorporated as appropriate.

As agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies of this report to the Secretaries of Energy and Homeland Security; the Director of the Office of Management and Budget; the appropriate congressional committees;

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and other interested parties. In addition, the report will be available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff members have any questions about this report, please contact me at (202) 512-3841 or [trimbled@gao.gov](mailto:trimbled@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix VIII.

A handwritten signature in black ink that reads "David C. Trimble". The signature is written in a cursive style with a large initial 'D' and a distinct 'C'.

David C. Trimble  
Director, Natural Resources and Environment

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# Appendix I: Objectives, Scope, and Methodology

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The objectives of our review were to assess (1) the status of the Megaports Initiative (Initiative) and the National Nuclear Security Administration's (NNSA) plans for completing and sustaining it and (2) benefits of the Initiative and factors, if any, that reduce its effectiveness.

For both objectives, we obtained and analyzed relevant NNSA documentation, including the Megaports Initiative Program Plans for 2011 and 2010, the *2011 Second Line of Defense Implementation Strategy*, and the *2006 Second Line of Defense Strategic Plan*. We also reviewed memorandums of understanding and cost-sharing arrangements between the Department of Energy (DOE) and partner countries, as well as sustainability and joint transition plans. Furthermore, we reviewed and met with NNSA officials responsible for the Initiative's prioritization model, which NNSA developed to help prioritize and select ports for participation in the Initiative. We also analyzed information about the ports NNSA has completed thus far, including information about their cost-sharing, transition dates, and rankings. In addition, we interviewed NNSA officials responsible for implementing and managing the Megaports Initiative about the status of the program, its future plans, sustainability activities, and challenges associated with implementation. We also interviewed NNSA country managers about operational Megaports. Moreover, we interviewed contractors who help implement the Initiative at two DOE national laboratories: (1) Pacific Northwest National Laboratory about equipment, training, and procurement activities and (2) Oak Ridge National Laboratory about its analysis of equipment performance data and alarms. We interviewed officials at the Department of Homeland Security (DHS) and the Department of State about coordination with the Megaports Initiative. Furthermore, we interviewed officials from two global terminal operators—DP World and Hutchinson Port Holdings—regarding their perspectives on the Megaports Initiative.

In addition, we visited a nonprobability sample of eight seaports in five countries<sup>1</sup>—Belgium, the Dominican Republic, Jamaica, Panama, and Spain—to observe scanning operations and interview foreign government and port officials.<sup>2</sup> We selected these seaports on the basis of port size,

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<sup>1</sup>These seaports included: Belgium: Antwerp and Zeebrugge; Dominican Republic: Caucedo; Jamaica: Kingston; Panama: Balboa, Colon Container Terminal, and Manzanillo International Terminal; and Spain: Barcelona.

<sup>2</sup>For our 2005 report, we visited Megaports in Rotterdam, the Netherlands, and Piraeus, Greece.

NNSA's priority ranking, NNSA's expenditures at the port, history of cost-sharing with NNSA, length of time in the Megaports Initiative, joint presence with DHS's Container Security Initiative (CSI), and unique characteristics of specific locations. At the seaports we visited, we interviewed foreign government officials using a standard set of questions about their participation in and perspective on the Megaports Initiative. These officials included those from customs offices and offices who handle the response to nuclear emergencies, as well as terminal operators and port authorities. Because we used a nonprobability sample to select the eight Megaports we visited, the observations we made are not generalizable to other Megaports but serve as examples of challenges and concerns that may affect Megaports operations and sustainability. We also interviewed DHS officials co-located at these seaports and U.S. embassy officials in these countries.

To assess the status of the Megaports Initiative and NNSA's plans for completing and sustaining it, we analyzed the Megaports Initiative's budget information and expenditure data for fiscal years 2003 through 2012, as well as projected costs through fiscal year 2018. We interviewed knowledgeable NNSA officials to assess the reliability of the data and discussed such issues as data entry, access, quality control procedures, and the accuracy and completeness of the data. We determined that the data provided to us were of sufficient reliability for the purposes of this review. Moreover, we reviewed NNSA's budget request and related budget documents for fiscal year 2013 and spoke with Office of Management and Budget staff about proposed changes to the Megaports Initiative's fiscal year 2013 budget. We also requested and analyzed data on Megaports partner countries' cost-sharing contributions. Because these contributions are a combination of NNSA and foreign country estimates, we did not have a way to verify these data. As such, these data are of undetermined reliability. We are nonetheless reporting these cost-sharing data to provide some context on cost-sharing contributions made by partner countries.




To assess the benefits of the Megaports Initiative and any factors that reduce its effectiveness, we obtained and reviewed lessons learned that NNSA officials document in a central database, performance measures in DOE's fiscal year *2011 Annual Performance Report*, plans for radiation detection equipment outlined in the Megaports Initiative's *2012 Alternative Detection Technology Strategy*, and information on the Initiative's costs for storing radiation detection equipment. We also reviewed DHS's U.S. Customs and Border Protection's directive on its domestic radiation detection program. In addition to the interviews listed above, we also

interviewed NNSA headquarters, Pacific Northwest National Laboratory, and foreign officials about the benefits and challenges they have encountered in implementing the Initiative. We also conducted an interview with officials from DOE's Office of Intelligence and Counterintelligence regarding the Megaports Initiative's process for selecting ports.




We conducted this performance audit from August 2011 to October 2012 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.



# Appendix II: Radiation Detection Equipment Used by the Megaports Initiative

Equipment type	Description and uses	Limitations	Number of units deployed to Megaports	Number of units in storage
Radiaton Detection Portal Monitor (RPM)				
	<ul style="list-style-type: none"> <li>• RPMs scan shipping containers on trucks or railcars as they are entering or exiting seaports or as shipping containers are being off-loaded from sea vessels.</li> <li>• Used for primary scanning purposes.</li> </ul>	<ul style="list-style-type: none"> <li>• RPMs cannot distinguish the type of material causing an alarm.</li> </ul>	458 vehicle RPMs and 58 rail RPMs	134 vehicle RPMs and 32 rail RPMs
Mobile Radiaton Detection Identification System (MRDIS)				
	<ul style="list-style-type: none"> <li>• Used to scan containers at high-volume transshipment ports.</li> <li>• After the MRDIS is parked at a scanning location, trucks drive containers through it in the same manner as a fixed RPM.</li> <li>• Can be driven to different locations in a port.</li> <li>• Used for primary scanning purposes, but also sometimes equipped with technology that can conduct secondary inspections.</li> </ul>	<ul style="list-style-type: none"> <li>• MRDISs with only primary scanning capabilities cannot distinguish the type of material causing an alarm.</li> </ul>	13	0
Radiaton Detection Straddle Carrier (RDSC)				
	<ul style="list-style-type: none"> <li>• Used to scan containers at high-volume transshipment ports that use straddle carriers for port operations.</li> <li>• Can be driven through rows of containers stacked one to three high.</li> <li>• Equipped with technology for both primary and secondary scanning.</li> </ul>	<ul style="list-style-type: none"> <li>• RDSCs are designed to operate in ports where containers are stacked up to three high and that currently use straddle carriers to move containers, but not all ports have such a configuration.</li> </ul>	2	2

**Appendix II: Radiation Detection Equipment  
Used by the Megaports Initiative**

Equipment type	Description and uses	Limitations	Number of units deployed to Megaports	Number of units in storage
<b>Spectroscopic Portal Monitor (SPM)<sup>a</sup></b>				
	<ul style="list-style-type: none"> <li>• SPMs look similar to standard RPMs but have an additional capability to identify the source of radiation.</li> <li>• The Initiative has deployed some SPMs in select locations.</li> <li>• Used for secondary inspections.</li> </ul>	<ul style="list-style-type: none"> <li>• NNSA is currently using the SPM units at select seaports for testing and evaluation purposes</li> </ul>	17 <sup>b</sup>	21
<b>Radioisotope Identification Device (RIID)</b>				
	<ul style="list-style-type: none"> <li>• RIIDs are handheld devices used to pinpoint the source of an alarm in a shipping container and determine the type of radioactive material present.</li> <li>• Used for secondary scanning purposes.</li> </ul>	<ul style="list-style-type: none"> <li>• GAO has previously reported that completing a secondary inspection with a RIID typically takes several minutes.<sup>c</sup></li> </ul>	334	31
<b>Personal Radiation Detector (PRD)</b>				
	<ul style="list-style-type: none"> <li>• PRDs, or pagers, are small detectors that can be worn on an individual's belt to continuously monitor radiation levels in the immediate area of the officials.</li> <li>• PRDs help to ensure personal safety.</li> </ul>	<ul style="list-style-type: none"> <li>• PRDs are not appropriate for scanning shipping containers.</li> </ul>	958	290

Sources: GAO analysis of NNSA documents; GAO (photographs).

<sup>a</sup>SPMs are formerly known as advanced spectroscopic portal (ASP) monitors.

<sup>b</sup>NNSA has also deployed four SPM units to DOE's national laboratories for testing and evaluation purposes.

<sup>c</sup>GAO, *Combating Nuclear Smuggling: DHS's Cost-Benefit Analysis to Support the Purchase of New Radiation Detection Portal Monitors Was Not Based on Available Performance Data and Did Not Fully Evaluate All the Monitors' Costs and Benefits*, [GAO-07-133R](#) (Washington, D.C.: Oct. 17, 2007).

# Appendix III: Information about NNSA Megaports

Country	Megaport	Priority ranking, by tier <sup>a</sup>	Size <sup>b</sup>	Operational date <sup>c</sup>	Transition date <sup>d</sup>	CSI port	Percentage of total container volume scanned (estimated)
Argentina	Buenos Aires	50-100	Medium	Sept. 2012 <sup>e</sup>	Sept. 2015	Yes	97 <sup>f</sup>
Bahamas	Freeport	50-100	Small	June 2006	Sept. 2014 <sup>g</sup>	Yes	85
Bangladesh	Chittagong	1-50	Medium	June 2011	July 2014	No	81
Belgium	Antwerp	1-50	Large	April 2007	Jan. 2010	Yes	73
	Zeebrugge	100-150	Medium	April 2009	Sept. 2010	Yes	75
Cambodia	Sihanoukville	50-100	Small	Sept. 2011	Sept. 2014	No	100
China	Shanghai	1-50	Medium	Dec. 2011	Dec. 2014	Yes	81
Colombia	Cartagena	100-150	Small	Sept. 2008	Apr. 2012 <sup>h</sup>	Yes	33
Djibouti	Djibouti	50-100	Small	March 2011	March 2014	No	65
Dominican Republic	Caucedo	100-150	Small	Sept. 2008	Sept. 2011	Yes	99
Greece	Piraeus <sup>i</sup>	150-200	Medium	Aug. 2004	Oct. 2007	Yes	80
Honduras	Puerto Cortes	100-150	Small	April 2007	Sept. 2012 <sup>j</sup>	Yes	100
Israel	Ashdod	1-50	Medium	Nov. 2010	Nov. 2013	Yes	95
	Haifa	1-50	Small	Jan. 2008	Dec. 2015 <sup>k</sup>	Yes	31
Jamaica	Kingston	50-100	Small	June 2009	March 2015 <sup>l</sup>	Yes	85
Jordan	Aqaba	50-100	Small	Sept. 2010	Sept. 2013 <sup>m</sup>	No	100
Kenya	Mombasa	50-100	Medium	Feb. 2011	Feb. 2014	No	65
Lebanon	Beirut	1-50	Small	Aug. 2010	July 2013	No	47
Malaysia	Klang	1-50	Large	Sept. 2009	Sept. 2013	Yes	70
	Tanjung Pelepas	1-50	Medium	Sept. 2010	Sept. 2013	Yes	90
Malta	Marsaxlokk	50-100	Small	June 2012	June 2015	No	49
Mexico	Altamira <sup>i</sup>	150-200	Small	Dec. 2011	May 2013	No	82
	Lazaro Cardenas <sup>i</sup>	150-200	Small	June 2009	May 2013	No	50
	Manzanillo	100-150	Small	Nov. 2009	May 2013	No	76
	Veracruz	100-150	Small	March 2009	May 2013	No	85
Netherlands	Rotterdam	1-50	Small	April 2004	Oct. 2007	Yes	70
Oman	Salalah	100-150	Medium	Sept. 2008	Oct. 2015 <sup>n</sup>	Yes	36
Pakistan	Qasim	50-100	Small	Oct. 2007	TBD <sup>o</sup>	Yes	10
Panama	Balboa	100-150	Small	Sept. 2008	Dec. 2011	Yes	20 <sup>p</sup>
	Colon Container Terminal <sup>i</sup>	150-200	Small	Jan. 2010	Jan. 2013	Yes	5 <sup>p</sup>
	Cristobal <sup>i</sup>	150-200	Small	Jan. 2010	Jan. 2013	No	5 <sup>p</sup>
	Manzanillo International Terminal <sup>i</sup>	150-200	Small	Sept. 2008	Dec. 2011	Yes	10 <sup>p</sup>

**Appendix III: Information about NNSA  
Megaports**

Country	Megaport	Priority ranking, by tier <sup>a</sup>	Size <sup>b</sup>	Operational date <sup>c</sup>	Transition date <sup>d</sup>	CSI port	Percentage of total container volume scanned (estimated)
Philippines	Manila	1-50	Medium	Feb. 2007	Sept. 2014	No	100
	Port of Cebu	50-100	Small	Sept. 2012 <sup>e</sup>	Sept. 2014	No	99 <sup>f</sup>
Portugal	Lisbon <sup>l</sup>	150-200	Medium	Sept. 2009	June 2013 <sup>q</sup>	Yes	90
Singapore	Singapore	1-50	Small	April 2006	June 2012	Yes	14
South Korea	Busan	1-50	Small	March 2009	March 2014 <sup>r</sup>	Yes	28
Spain	Algeciras <sup>i</sup>	150-200	Medium	March 2006	July 2014 <sup>s</sup>	Yes	9
	Barcelona	100-150	Medium	June 2011	July 2014	Yes	55
	Valencia	50-100	Medium	Sept. 2010	Apr. 2014	Yes	49
Sri Lanka	Colombo	1-50	Medium	Jan. 2006	Apr. 2013 <sup>t</sup>	Yes	31
Taiwan	Kaohsiung	1-50	Large	Sept. 2009	Sept. 2012	Yes	98
Thailand	Laem Chabang	1-50	Large	May 2007	Apr. 2014 <sup>u</sup>	Yes	96
United Kingdom	Southampton <sup>v</sup>	1-50	Small	Oct. 2007	June 2010	Yes	0
Vietnam	Cai Mep <sup>w</sup>	150-200	Medium	Sept. 2012 <sup>e</sup>	Sept. 2015	No	95 <sup>f</sup>

Source: GAO analysis of NNSA documents.

<sup>a</sup>The priority ranking listed is NNSA's prioritization ranking by countries' adjusted score. NNSA prioritizes countries with a raw score and then adjusts the rankings by removing countries from the list that (1) have low container volume, (2) NNSA cannot work with for diplomatic or policy reasons, or (3) NNSA or other organizations conduct similar work at that port. For security purposes, we have clustered the rankings into tiers: 1-50, 50-100, 100-150, and 150-200.

<sup>b</sup>NNSA estimates the size of the Megaports installation—small, medium, or large—based on the number of RPM units needed to scan as many shipping containers as possible. This may be different from the physical size of the port.

<sup>c</sup>The operational date is the date that the partner country begins operating the Megaports radiation detection scanning equipment.

<sup>d</sup>The transition date is the date that NNSA currently plans to transfer all equipment, maintenance, operations, and related financial responsibilities to partner countries.

<sup>e</sup>These dates are NNSA's current estimates.

<sup>f</sup>These ports were constructed during fiscal year 2012 and, therefore, the percentages of containers scanned are NNSA's expected scanning volumes, rather than actual estimated figures.

<sup>g</sup>From 2006 through 2010, NNSA tested a prototype of the RDSC in Freeport. NNSA began operating a second generation RDSC in June 2010. NNSA had discussions with the Bahamian government in June 2012 and intends to transfer responsibility for the RDSC in September 2014.

<sup>h</sup>NNSA officials told us that Colombian Customs requested an extension of the transition date in June 2010.

<sup>i</sup>According to NNSA documents, these countries were added to the Megaports prioritization list because they were (1) already operational prior to NNSA developing its prioritization model or (2) a specific port of interest for the Megaports Initiative.

<sup>j</sup>According to NNSA officials, the sustainability period was extended from 2009 through 2012 because of political turmoil in Honduras.

<sup>k</sup>The Megaports Initiative began a pilot project at the Port of Haifa in January 2008, which it dismantled in January 2012. NNSA expects to complete full installation at Haifa in December 2012 and plans to transition the equipment in December 2015.

<sup>l</sup>The Megaports Initiative has installed radiation detection equipment at two terminals in Kingston. The first terminal began operations in June 2009, and NNSA transitioned the equipment to Jamaican

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### Appendix III: Information about NNSA Megaports

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Customs in June 2012. The second terminal began operations in March 2012, and NNSA expects to transition the equipment in March 2015.

<sup>m</sup>The Megaports Initiative installed equipment at four different locations in Jordan—including at one port in Aqaba and at three land border sites—and will provide each location with 3 years of maintenance, as follows: Aqaba, September 2010 through September 2013; Jaber crossing, March 2011 through March 2014; Al Karama crossing, June 2011 through June 2014; and Al Omari crossing, May 2012 through May 2015. NNSA considers all work in Jordan as one Megaport.

<sup>n</sup>NNSA installed radiation detection equipment at the Port of Salalah, Oman, in September 2008 but has since updated some of the MRDIS radiation detection equipment with second generation units, which NNSA expects to be operational by October 2012. NNSA intends to transfer the equipment to the government of Oman in October 2015.

<sup>o</sup>The Port of Qasim is the only port remaining under the Secure Freight Initiative and, according to NNSA, there is no planned transition date at this time. The Secure Freight Initiative is a DHS and DOE program at selected ports that aims to scan 100 percent of U.S.-bound container cargo for nuclear and radiological materials overseas using non-intrusive imaging systems and radiation detection equipment.

<sup>p</sup>These scanning estimates are according to the *Megaports Initiative 2011 Program Plan*. However, Panamanian customs officials that we met with told us that they currently scan less than 1 percent of their container traffic at their four Megaports.

<sup>q</sup>NNSA installed Megaports equipment at the Port of Lisbon, Portugal, in two phases. The first phase began operating in September 2009, and the second began operating in June 2010. NNSA plans to transfer the equipment to the Portuguese government in June 2013.

<sup>r</sup>NNSA and DHS started the Secure Freight Initiative at the Port of Busan in March 2009, and DHS decommissioned its equipment in March 2010. The Megaports Initiative signed a new Memorandum of Understanding in September 2010 and restarted the radiation detection system in March 2011.

<sup>s</sup>NNSA transitioned responsibility for RPM units at Algeciras to Spanish Customs in December 2010 and plans to transition responsibility for a SPM unit in July 2014.

<sup>t</sup>NNSA added a SPM unit in fiscal year 2009, and in fiscal year 2010 NNSA began an upgrade project to improve Megaports operations at Colombo. NNSA aims to transition responsibility of the equipment to the Sri Lankan government in April 2013.

<sup>u</sup>NNSA and the Thai government negotiated a longer transition period because of initial system issues and a request from the Thai government to have a 5-year transition period.

<sup>v</sup>NNSA began operations in Southampton in October 2007 through the Secure Freight Initiative, but DHS concluded Secure Freight Initiative operations in June 2010. NNSA terminated operations of the radiation detection equipment in June 2010 and gave an SPM unit to the United Kingdom Border Agency, which relocated the equipment to another port.

# Appendix IV: List of Operational Megaports and Megaports Being Implemented

Country	Megaport
Argentina	Buenos Aires <sup>a</sup>
Bahamas	Freeport
Bangladesh	Chittagong
Belgium	Antwerp
	Zeebrugge
Cambodia	Sihanoukville
China	Shanghai
Colombia	Cartagena
Djibouti	Djibouti
Dominican Republic	Caucedo
Greece	Piraeus
Honduras	Puerto Cortes
Israel	Ashdod
	Haifa
Jamaica	Kingston
Jordan	Aqaba
Kenya	Mombasa
Lebanon	Beirut
Malaysia	Klang
	Tanjung Pelepas
Malta	Marsaxlokk
Mexico	Altamira
	Lazaro Cardenas
	Manzanillo
	Veracruz
Netherlands	Rotterdam
Oman	Salalah
Pakistan	Qasim
Panama	Balboa
	Colon Container Terminal
	Cristobal
	Manzanillo International Terminal
Philippines	Manila
	Port of Cebu <sup>a</sup>
Portugal	Lisbon

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**Appendix IV: List of Operational Megaports  
and Megaports Being Implemented**

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<b>Country</b>	<b>Megaport</b>
Singapore	Singapore
South Korea	Busan
Spain	Algeciras
	Barcelona
	Valencia
Sri Lanka	Colombo
Taiwan	Kaohsiung
Thailand	Laem Chabang
United Kingdom	Southampton
Vietnam	Cai Mep <sup>a</sup>

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Source: NNSA.

<sup>a</sup>NNSA expects these Megaports to become operational in September 2012.

# Appendix V: Megaports Initiative's Total Budget and Expenditures, Fiscal Years 2003 through 2012

Dollars in thousands

Fiscal year	Enacted budget (current dollars)	Supplemental funding (current dollars)	Enacted budget (constant dollars)	Supplemental funding (constant dollars)	Total budget (constant dollars)	Total expenditures (constant dollars)
2003	\$15,000	\$84,000	\$18,340	\$102,702	\$121,042	\$1,341
2004	13,000	0	15,501	0	15,501	56,381
2005	15,000	29,000	17,323	33,492	50,815	60,921
2006	73,929	0	82,575	0	82,575	57,065
2007	40,118	71,000	43,522	77,025	120,547	88,673
2008	132,047	0	140,003	0	140,003	102,749
2009	108,091	0	112,973	0	112,973	136,397
2010	174,264	0	180,461	0	180,461	167,344
2011	124,884	0	126,824	0	126,824	145,126
2012	132,670	0	132,670	0	132,670	33,787 <sup>a</sup>
<b>Total</b>	<b>\$829,003</b>	<b>\$184,000</b>	<b>\$870,193</b>	<b>\$213,219</b>	<b>\$1,083,412</b>	<b>\$849,784</b>

Source: GAO analysis of NNSA data.

<sup>a</sup>Fiscal year 2012 expenditures are as of December 2011.



# Appendix VI: Comments from the Department of Energy

Note: GAO comments supplementing those in the report text appear at the end of this appendix.



Department of Energy  
National Nuclear Security Administration  
Washington, DC 20585



October 12, 2012

Mr. Mark Gaffigan  
Managing Director  
Natural Resources and Environment  
Government Accountability Office  
Washington, DC 20458

Dear Mr. Gaffigan:

The National Nuclear Security Administration (NNSA) appreciates the opportunity to review the Government Accountability Office's (GAO) report, *COMBATING NUCLEAR SMUGGLING: Megaports Initiative Faces Funding and Sustainability Challenges, GAO-13-37*. In response to a request made by the Committee on Oversight and Government Reform, House of Representatives, GAO was asked to determine: (1) What is the status of the Megaports Initiative, and what challenges, if any, affect its implementation and completion; (2) When does NNSA anticipate completing the Initiative, and what are the costs to implement and complete it; (3) To what extent are partnering countries funding or sharing costs of the installation, and what assurance does NNSA have that these countries will continue to provide funding for the Initiative; (4) To what extent does NNSA effectively coordinate with other agencies, such as with Department of Homeland Security's (DHS) Container Security Initiative; and (5) How do legal and policy requirements affect implementation of the Initiative.

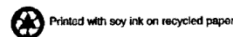
The GAO provided five recommendations to NNSA to help ensure the Megaports Initiative is maximizing its resources and protecting its Megaports, and to strengthen efforts to combat nuclear smuggling overseas. NNSA agrees with the recommendations and in most cases has already begun to address the issues identified in the report. The enclosure to this letter provides our initial response to the report recommendations. We have also enclosed general and technical comments for your consideration in improving the factual accuracy and clarity of the report.

If you have any questions concerning this response, please contact Dean Childs, Director, Internal Control, at 301-903-1341.

Sincerely,

Cynthia A. Lersten  
Associate Administrator  
for Management and Budget

Enclosure



Enclosure

**Initial Response to Report Recommendations**

*To ensure that the Megaports Initiative is maximizing resources and protecting its investments of \$850 million, we recommend that the Administrator of the National Nuclear Security Administration take the following four actions:*

**Recommendation 1:** *Finalize its draft sustainability plan for ensuring ongoing sustainability of Megaports operations after NNSA transfers all equipment, maintenance, operations, and related financial responsibilities to partner countries.*

***Management Response: Agree:*** NNSA intends to finalize its Sustainability Plan in October 2012.

**Recommendation 2:** *Develop and maintain useful and reliable measures to assess the performance of the Megaports Initiative. These measures might include the number and type of interdictions, percentage of global maritime container traffic scanned, or length of time that countries sustain operations of the Megaports equipment.*

***Management Response: Agree:*** NNSA has introduced a new Sustainability Metric, which will be used in fiscal year (FY) 2014. Should Megaports implementation efforts resume in the future, Second Line of Defense (SLD) will work with NNSA to determine appropriate performance metrics.

**Recommendation 3:** *Terminate additional expenditures from the Megaports Initiative's budget for testing and evaluating Spectroscopic Portal Monitor's (SPM). Additional testing and evaluation activities, if warranted, should be funded through other NNSA programs with a research and development mission.*

***Management Response: Agree:*** NNSA does not intend to test or deploy any additional SPM units and will terminate related expenditures from the budget.

**Recommendation 4:** *Remove unused Megaports radiation detection equipment—particularly SPMs and Radiation Detection Straddle Carriers (RDSCs)—from storage on an expedited basis. This could be done, for example, by (1) providing the equipment to the Department of Energy (DOE) national laboratories for research and further testing, or (2) declaring the equipment as surplus inventory.*

***Management Response: Agree:*** As noted in the GAO report, NNSA is in the process of developing a disposition plan for the SPMs, which will be put into place in FY 2013. NNSA is also working to identify ports that may be able to use the RDSCs.

***To strengthen efforts to combat nuclear smuggling overseas, we also recommend that the Administrator of the National Nuclear Security Administration and the Secretary Homeland Security:***

**Recommendation 5:** *On a periodic basis, jointly assess the extent to which the Megaports Initiative and Container Security Initiative (CSI) are effectively leveraging resources and coordinating at foreign seaports where the two Initiatives are co-located. If the agencies determine based on these joint assessments that there is a need for increased coordination, they should develop written policies or procedures that formally document how to coordinate at ports to best leverage their resources.*

**Management Response: Agree:** NNSA and Department of Homeland Security (DHS)/ U.S. Customs Border Protection (CBP) are already cooperating in many areas and have agreed to formalize this cooperation through an interagency agreement. This agreement will document areas where the two agencies are currently working together and identify areas for further collaboration. This document will be in place by March 29, 2013.

**General Comments**

See comment 1.

- Page 13: GAO notes that in 2005, the Megaports Initiative had completed work at only two Megaports due in part to diplomatic and other impediments that had limited its ability to complete more work, and that some of these challenges still exist today. NNSA agrees that it faces diplomatic and other challenges in partnering with certain countries; however, it should be noted that the Megaports Initiative has made significant progress in this area-- while only two Megaports installations had been completed in 2005, 44 have been completed as of October 1, 2012.

See comment 2.

- Pages 18 and 27: GAO notes several concerns with China's level of commitment to the Megaports Initiative. NNSA takes exception to the GAO's conclusion that China has not fully embraced the Megaports Initiative and offers the following response, which was also provided when the draft Statement of Facts was submitted.
  - Number of Chinese Megaports: Following the signing of the Memorandum of Understanding (MOU) with China, NNSA and China Customs (GACC) agreed to a pilot project at the port of Yangshan (Shanghai). Because of the pilot nature of the project, there was an understanding that other ports would not be equipped until the pilot was operational and the impacts evaluated. NNSA did not intend to equip multiple ports in China at the same time and Yangshan was just completed in November 2011. This approach is consistent with the Megaports' experience in other countries, whereby, additional ports are pursued following completion of an initial port. NNSA and GACC had had discussions about equipping other seaports in China in the future; however, the outyear SLD budget makes future cooperation uncertain.
  - Scanning of Exports: Because Yangshan was a pilot and is a large port, NNSA and GACC agreed to only equip the 17 export lanes to ensure that the equipment could be used to scan containers without impacting port operations.
  - Use of indigenous monitors: NNSA does not require that partners use a certain brand of monitor, and realizes that there are benefits to partners using indigenous monitors. NNSA tested the Nuctech equipment to ensure that it met our detection standards as we have done with other partners. Additionally, having an indigenous monitor will be helpful for the long-term sustainability of the equipment by the GACC.
  - Data sharing: Like all the Megaports MOUs, the MOU with China allows for the sharing of information on the detection or seizure of illicitly trafficked special nuclear material and other radioactive materials. The MOU also allows for the collection of data relating to the operation and health of the Radiation Portal Monitors (RPMs) for testing and evaluation purposes. Although NNSA does not receive monthly daily files from China, Megaports has collected data for the purposes of testing and evaluating the capabilities of the RPMs and evaluation of RPM operations to ensure the RPMs are optimized to detect highly enriched uranium and plutonium. In short, China is meeting its obligations related to data sharing as outlined in our MOU (Note: Daily files are not specifically mentioned in any Megaports MOU).

See comment 3.

See comment 4.

See comment 5.

- Cost-sharing: GAO notes that China provided only a small amount of funding toward the Yangshan project. It should be noted that SLD and China have also partnered on a cost-sharing basis on the development of a Training Center for Customs Officers in Qinhuangdao, China. SLD's investment in this Center is approximately \$6M, while China's investment is approximately \$20M.
- Page 23: GAO notes "limited testing and deployment of radiation detection equipment" as a program management weakness. NNSA assumes that this comment refers, in particular, to SPMs. NNSA acknowledges GAO's concerns with SPMs, but would like to clarify that the vast majority of the equipment it has deployed is radiation portal monitors, which use well-tested, industry standard gamma and neutron detection capabilities.
- Page 24: GAO notes in its finding section "Some Partner Countries Not Fully Using Radiation Detection Equipment," that a limited number of secondary inspections as an example of this. NNSA would like to make the following clarifications on this point, which were also provided in response to GAO's Statement of Facts:
  - NNSA recognizes the importance of conducting secondary inspections and does advise and encourage partner countries to conduct as many secondary inspections as they practically can on containers generating primary alarms. NNSA also recognizes the practical challenges to conducting secondary inspections on 100% of alarming containers, such as impact to the flow of commerce caused by diversion of a truck from its normal route to a secondary inspection area and inspection time, high Naturally Occurring Radioactive Material (NORM) alarms rates at certain ports, and availability of staff to conduct inspections. In light of these challenges, the Megaports Initiative acknowledges that many partner countries will not be able to conduct 100% secondary inspections and trains partner countries to prioritize which containers are selected for secondary inspection. Information such as the cargo commodity, the radiation profile (i.e. point source versus distributed radiation source), shipper, country of origin, and destination are used to make this determination. In addition, many Megaports partners keep records of the radiation alarms for various types of cargo that can be used as a reference to see if the radiation level of a primary alarm is consistent with previous alarms of similar cargo. Belgium, for example, has developed an extensive NORM library to help with the adjudication of alarms, and has shared their template with other Megaports partners. It is also important to note that the Concept of Operations (ConOps) and communications systems for all Megaports require that all containers generating an alarm, not only those sent for secondary inspection, are acknowledged and reviewed by the partner country prior to releasing, thereby helping to ensure that all alarms are carefully considered before being released. Megaports continues to work with partner countries to increase the number of secondary inspections conducted, and multiple sites are performing a high percentage of secondary inspections.
- Page 26: GAO cites Panama as an example of a country that has not fully embraced the Megaports Initiative because their Megaports are currently scanning low volumes of traffic. NNSA takes exception to this finding and offers the following response, which was also provided when the draft Statement of Facts was submitted.

- NNSA takes exception to the finding that Panama has not fully embraced the Megaports Initiative. Panama is an example of a country where NNSA signed a joint agreement with DHS/CSI. As implementation plans were developed, Megaports agreed, as a first step, to place monitors nearby the CSI equipment so that all CSI targeted containers would be scanned by RPMs. This resulted in a small fraction of containers being scanned. DOE realized that the fixed-RPM deployments would be insufficient considering that the majority of cargo at all Panama ports is transshipment (90-95% of total twenty-foot equivalent units). Therefore, Megaports planned on increasing scanning percentages by deploying mobile detection systems (once this technology was proven) to scan the transshipped containers. Site surveys were conducted in March 2011 and it was determined that at Balboa, Manzanillo International Terminal (MIT), and Colon Container Terminal (CCT) it would be feasible to deploy the Mobile Radiation Detection and Identification System (MRDIS) units to scan transshipment traffic. The Port of Cristobal currently has too constricted of an area to accommodate a MRDIS, but the port's expansion efforts may allow for future deployment. MRDIS units are currently assembled in Balboa and will begin operations in October. Deployment of the MRDIS to other ports in Panama is uncertain due to the FY 2013 budget. With regard to terminal operator concerns, Megaports is working closely with the port management and Panama Customs to ensure that the impact of the MRDIS is minimal at Balboa. Additionally, Panama Customs is a strong supporter of the Megaports Initiative and had expressed its willingness (pre-budget release) to work with the terminal operators of the other ports to address concerns and enforce additional scanning if necessary. Customs has also been working to incrementally increase scanning through the RPM lanes at MIT, CCT and Cristobal. Moreover, Panama Customs has already assumed full responsibility for the RPMs installed at Balboa and MIT, and is on target to assume responsibility for the equipment at CCT and Cristobal.

- Pages 28-34: GAO notes several management weaknesses with the Megaports Initiative. NNSA would like to offer the following comments on each of these items.

- Although the SLD Sustainability Program Plan, which documents its long-term sustainability strategy, has not yet been finalized, SLD would like to note that it does have a formal method for following up with and measuring the performance and progress of its partner countries.

SLD typically provides partner countries with three years of maintenance and sustainability support once an installation is complete. During this three-year transition phase, information on progress toward transition is gathered through a variety of information sources including joint assurance visits conducted by partner country and SLD personnel, daily file analysis, reports from the local maintenance providers (LMPs), and reports from the SLD Help Desk. Each site is regularly assessed to determine its progress in the three key areas operations and management, training, and maintenance and logistics. The results of these assessments are formally documented in a SLD database so that progress can be tracked and measured. SLD does also follow-up with and track the progress of partners beyond the transition phase.

Further, GAO notes challenges that may compromise sustainability of Megaports operations such as partner country staffing or funding issues. NNSA would like to note

See comment 6.

See comment 7.

that given the complex nature of radiation detection systems and the wide-range of partner country capabilities, SLD planning accounts for challenges to transitioning systems to partner country responsibility. Further, SLD realizes that certain partner countries will possibly require more mentoring and assistance over a longer transition phase. It should be noted that it is not practical, nor is it SLD's objective, to plan to eliminate all challenges associated with supporting SLD systems, but instead to teach and mentor each partner country on how to best mitigate the risks and effectively plan to support the long term operation of SLD systems.

- Page 31-63: GAO raised multiple concerns with SLD's testing and deployment of Spectroscopic Portal Monitors (SPMs). NNSA would like to offer the following comments and clarifications on GAO's findings.
  - Page 31: GAO notes that "NNSA officials told us that after receiving the ASPs from DHS, they changed the name of the equipment to SPMs to avoid the negative connotations associated with the ASP program." NNSA would like to note that SLD began using the commonly accepted term SPM because it is the general term for all spectroscopic portal monitors. ASP was a specific brand developed by Thermo Fisher. The SLD office has Thermo, Canberra, and Raytheon spectroscopic portal monitors, so it is more accurate to refer to these monitors with the general term "SPM" as opposed to ASPs. NNSA recommends striking this comment from the report.
  - Page 31: GAO notes that one port they visited makes limited use of their SPM. NNSA can also cite an example where one port in Thailand uses their SPM on 100% of alarming containers.
  - Page 36: GAO notes that "NNSA has not deployed a significant amount of the Initiative's equipment as evidenced by the more than \$1 million it spent in both 2010 and 2011 to store radiation detection scanning equipment that it was unable to install in foreign countries." NNSA would like to note that these storage costs do not just cover the SPMs, but also RPMs. These RPMs were procured through a bulk competitive procurement, which is necessary for a program of this scale, and NNSA does have plans to deploy all of these RPMs. In FY 2013, NNSA is working to reduce its overall storage footprint and a key part of this effort will be to disposition the SPMs.

See comment 8.

See comment 9.

See comment 10.

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The following are GAO's comments on NNSA's letter dated October 12, 2012.

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## GAO Comments

1. We agree that NNSA has made progress installing additional Megaports, and we state several times throughout our report that NNSA had completed 42 Megaports as of August 2012. However, we also believe it is important to discuss challenges facing the Initiative, such as foreign political considerations that are outside of NNSA's control and have affected the agency's ability to implement the Initiative.
2. NNSA commented that it takes exception to five issues related to our finding that China has not fully embraced the Megaports Initiative: (1) the number of operational Chinese Megaports, (2) China's scanning of only exports, (3) the use of Chinese radiation detection equipment instead of U.S. equipment, (4) China's lack of sharing data related to the performance of equipment with NNSA, and (5) China's limited cost-sharing. We continue to believe that, collectively, these conditions we observed associated with the Chinese Megaport indicate that the Chinese government is not fully participating in the Initiative. Specifically:
  - As we state in our report, the Initiative has established only 1 Megaport in China out of the 12 Chinese ports that are ranked in the Initiative's top 100 highest priority ports. In our view, this indicates that much more needs to be done in China to address the potential risk of illicit trafficking of nuclear and radioactive material. However, as NNSA states in its written comments, the agency has discussed with the Chinese government adding additional Megaports in the future and, as a result, we have revised our report to include this information.
  - In its written comments, NNSA states that, as part of the pilot Megaport in China, NNSA and the Chinese government had agreed to equip 17 export lanes. Notwithstanding that fact, as we state in our report, most other partner countries scan exports and imports. As a result, it is important to scan both exports and imports because the goal of the Megaports Initiative is to scan as many shipping containers as possible, regardless of destination to meet the Initiative's most basic goal—combating nuclear smuggling.



- In its written comments, NNSA states that the Initiative does not require partners to use a certain brand of radiation detection equipment and that there are benefits to partners using indigenous equipment, such as strengthening sustainability. While we agree that there could be advantages to using indigenous equipment, nearly all partner countries use Megaports-provided equipment, which gives the United States greater assurance in the capabilities and reliability of the equipment. In the case of China, the Initiative had to spend additional funding to test and certify the Chinese equipment. In fact, senior NNSA officials told us in February 2012 that they believe the Initiative’s certification of this equipment gives the Chinese company an advantage in the global market. For these reasons, we stand by our finding that China’s insistence that the Initiative uses Chinese equipment reflects a lack of commitment to the Initiative.
  - In its written comments, NNSA states that its arrangement with China allows for the sharing of information on the detection or seizure of illicitly trafficked special nuclear material or other radioactive materials. This may be true, but China is one of the few Megaports partner countries that does not share scanning data with the United States. Without these data, NNSA does not have a consistent way to ensure that the equipment is being used properly or being used at all. In our view, routinely sharing these data is a gesture of goodwill, commitment, and cooperation on the part of the partner country.
  - In its written comments, NNSA responds to our finding that the Chinese provided a small amount of funding for the Megaports Initiative—\$256,000 as of February 2012. NNSA states in its comments that the Chinese government has contributed \$20 million to a training center for customs officers. The training center, however, is not part of the Megaports Initiative, and it does not help the Initiative in reaching its goals to scan shipping containers for nuclear and radiological material. In addition, senior NNSA officials told us that the Chinese contributions to the training center were a rough estimate and that they did not have great confidence in the accuracy or validity of the Chinese cost-sharing data.
3. We modified our report to clarify that our finding regarding the testing of radiation detection equipment is specific to SPMs and not radiation portal monitors.

4. In its comments, NNSA states that it wanted to clarify our finding that some partner countries are not fully using radiation detection equipment. We reiterate our finding that seven of the eight seaports we visited were using the secondary radiation detection equipment on a limited basis. As NNSA highlighted in its comments, we also state in our report that NNSA recognizes that there are practical challenges to conducting secondary inspections on 100 percent of containers that trigger a primary alarm. However, as we state in our report, at U.S. ports of entry, 100 percent of containers that produce an initial alarm must be verified with more precise secondary scanning equipment. Moreover, according to DHS officials who manage the domestic radiation detection program, secondary scanning reduces the risk that containers may be masking or shielding nuclear material.
5. NNSA states in its comments that it takes exception to our finding that Panama is not fully participating in the Megaports Initiative. Specifically, NNSA stated that Panama is an example of a country where NNSA signed a joint arrangement with DHS's Container Security Initiative. Moreover, according to NNSA, as implementation plans were developed, Megaports agreed, as a first step, to place radiation detection monitors near Container Security Initiative equipment so that all of DHS's targeted containers would be scanned by RPMs. This resulted in a small fraction of containers being scanned. Nevertheless, according to Panamanian officials, the four Megaports in Panama scan less than 1 percent of container traffic. Moreover, two terminal operators in Panama told us that they are not interested in conducting additional scanning. Officials from the terminal operator for the port where NNSA plans to add a MRDIS also told us in March 2012 that they have not yet agreed to the placement of the MRDIS and were concerned about it delaying port operations. In its comments, NNSA stated that Panamanian Customs officials support the Megaports Initiative—we agree. However, the example that we give to show that the Panama is not a full participant in the Initiative is that the terminal operators—who play a critical role in implementing the Initiative—expressed strong reservations about participating in the Initiative. As a result of our discussion with terminal operators in Panama, we continue to believe that Panama's four Megaports are not fully participating in the Initiative, as evidenced by the less than 1 percent of container traffic scanned—far from the Initiative's goal of scanning as many shipping containers as possible, regardless of destination.

6. NNSA states that SLD has taken several steps to help partner countries with sustainability, such as providing partner countries with 3 years of maintenance and sustainability support and regularly assessing countries' progress in operations and management, training, and maintenance and logistics. We state in the first section of our report that NNSA has developed the SLD Sustainability Program, and we discuss in detail the various components of this program.
7. We continue to believe that sustainability is a challenge for the Megaports Initiative. For example, officials in two of the countries we visited reported concerns about funding the operations and maintenance of Megaports equipment after NNSA transfers responsibility, and officials in all five countries we visited reported various staffing issues, such as recruiting, retaining, and funding staff who operate Megaports equipment and respond to alarms. Furthermore, a senior official who works for a global terminal operator told us that he is not confident that countries will continue operating the Megaports equipment if the Initiative is eliminated. As such, we continue to believe that, without a plan in place to ensure the sustainability of Megaports operations in the future, NNSA cannot be confident that this equipment will continue to be used for the purposes intended or if it will be used at all. NNSA agreed with this recommendation and stated that it intends to finalize the sustainability plan.
8. NNSA commented that SLD began using the term SPM instead of ASP because it is a general term for all spectroscopic portal monitors. This statement is in direct contradiction to what we were told by NNSA officials during the course of our review. At that time, NNSA officials stated that they changed the name of spectroscopic equipment from ASP to SPM to avoid the negative connotations associated with the ASP program. As a result, we are not revising the text.
9. In its comments, NNSA pointed out that we reported that one port we visited uses its SPM unit as a secondary scanning tool on a limited basis. To counter our finding, NNSA commented that Thailand uses its SPM unit on 100 percent of alarming containers. We did not independently verify that Thailand is using its SPM for 100 percent of containers that trigger a primary alarm.
10. We have modified this statement in the report to clarify that NNSA's storage costs of over \$1 million include SPMs, as well as other types of equipment. However, the larger point remains that SPMs are part of this unused inventory, and NNSA has agreed with our recommendation to remove SPM units from storage on an expedited basis.

# Appendix VII: Comments from the Department of Homeland Security

U.S. Department of Homeland Security  
Washington, DC 20528



**Homeland  
Security**

October 12, 2012

Mr. Mark Gaffigan  
Managing Director, Natural Resources and Environment  
U.S. Government Accountability Office  
441 G Street, NW  
Washington, DC 20548

Re: Draft Report GAO-13-37, "COMBATING NUCLEAR SMUGGLING: Megaports Initiative Faces Funding and Sustainability Challenges"

Dear Mr. Gaffigan:

Thank you for the opportunity to review and comment on this draft report. The U.S. Department of Homeland Security (DHS) appreciates the U.S. Government Accountability Office's (GAO's) work in planning and conducting its review and issuing this report.

The draft report contained one recommendation directly involving DHS with which the Department concurs. Specifically, GAO recommended that the Administrator of the National Nuclear Security Administration (NNSA) and the Secretary of Homeland Security:

**Recommendation:** On a periodic basis, jointly assess the extent to which the Megaports Initiative and the Container Security Initiative are effectively leveraging resources and coordinating at foreign seaports where the two Initiatives are co-located. If the agencies determine based on these joint assessments that there is a need for increased coordination, they should develop written policies or procedures that formally document how to coordinate at ports to best leverage their resources.

**Response:** Concur. DHS/U.S. Customs and Border Patrol (CBP) and Department of Energy/NNSA will work together to develop an interagency agreement to document areas where the two agencies are currently working together and to identify areas for further collaboration. Written procedures will be developed on collaboration for identifying nuclear material in cargo destined for the United States. CBP and NNSA will meet during October 2012 to draft the interagency agreement, which will be finalized no later than March 29, 2013.

Again, thank you for the opportunity to review and comment on this draft report. Technical comments were previously provided under separate cover. We look forward to working with you in the future.

Sincerely,



Jim H. Crumpacker  
Director  
Departmental GAO-OIG Liaison Office

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# Appendix VIII: GAO Contact and Staff Acknowledgments

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## GAO Contact

David C. Trimble, (202) 512-3841 or [trimbled@gao.gov](mailto:trimbled@gao.gov).

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## Staff Acknowledgments

In addition to the individual named above, Gene Aloise; Glen Levis, Assistant Director; Amanda Krause Kolling; Timothy Persons, Chief Scientist; Emily Suarez-Harris; and Holly Williams made key contributions to this report.

Technical assistance was also provided by Steve Caldwell, Antoinette Capaccio, Rebecca Shea, and Carol Herrnstadt Shulman.

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