

Anthony Wier and Matthew Bunn
Funding for U.S. Efforts
to Improve Controls Over
Nuclear Weapons, Materials,
and Expertise Overseas
Recent Developments and Trends

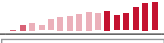






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Table I. U.S. Appropriations to Improve Controls on Nuclear Weapons, Materials, and Expertise
(Current Dollars, in Millions)

Goal/Program	FY 1992- FY 2007 Real Funding	Depart- ment	FY 2006 Final	FY 2007 Estimated ¹	FY 2008 Request	Change From FY 2006	
Total, Improving Controls on Nuclear Weapons, Material, and Expertise			1,123	1,149	996	-127	-11%
Securing Nuclear Warheads and Materials			564	593	488	-76	-14%
Material Protection, Control, & Accounting (excluding SLD)		Energy	303	353 ²	282 ³	-20	-7%
Nuclear Weapons Storage Security - Russia	Defense	129	87	23	-106	-82%
Global Threat Reduction Initiative	Energy	97	115	140	+43	+44%
Nuclear Weapons Transportation Security - Russia	Defense	30	33	38	+8	+26%
International Nuclear Security	Energy	6	6	5	-1	-12%
Interdicting Nuclear Smuggling			214	211	210	-4	-2%
Second Line of Defense (part of MPC&A budget line)	Energy	120	120 ²	119 ³	-1	-1%
Export Control and Related Border Security Assistance	State	43	43	41	-2	-4%
WMD Proliferation Prevention	Defense	41	37	38	-3	-6%
International Counterproliferation	Defense	10	11	11	0	+4%
Stabilizing Employment for Nuclear Personnel			107	107	89	-18	-17%
Global Threat Reduction Program ⁴	State	52	52	54	+1	+3%
Global Initiatives for Proliferation Prevention	Energy	40	40	20	-19	-49%
Civilian Research and Development Foundation ⁵	State	15	15	15	0	0%
Monitoring Stockpiles and Reductions			29	29	28	-1	-4%
HEU Transparency Implementation	Energy	19	19	14	-5	-25%
Warhead and Fissile Material Transparency	Energy	10	10	14	+4	+35%
Ending Further Production			174	174	182	+7	+4%
Elimination of Weapons Grade Plutonium Production	Energy	174	174	182	+7	+4%
Reducing Excess Stockpiles			34	34	0	-34	-100%
Russian Plutonium Disposition ⁶	Energy	34	34	0	-34	-100%

Notes

Values may not add due to rounding.

¹ FY 2007 values are estimated pending final allocation decisions by Congress and the Bush administration.

² In February 2007, for FY 2007 the administration also requested an additional \$49 million for the “core” Material Protection, Control, & Accounting program, as well an additional \$14 million for the Global Threat Reduction Initiative. Those requests await action by the Congress.

³ For FY 2008, the administration requested \$30 in supplemental funding to be split in an unspecified way between the “core” Material Protection, Control, & Accounting program and the Second Line of Defense program. For now, we assume all \$30 million to be part of the “core” MPC&A program.

⁴ In its FY 2008 budget proposal the State Department changed this program’s name from the Nonproliferation of Weapons of Mass Destruction Expertise program. A small, but unknown, percentage of the program’s resources will go towards its Nuclear Smuggling Outreach Initiative.

⁵ Amounts for this program are estimated pending further information from the State Department.

⁶ The Department of Energy intends to rely on balances from prior-year appropriations to carry out this program in FY 2008.

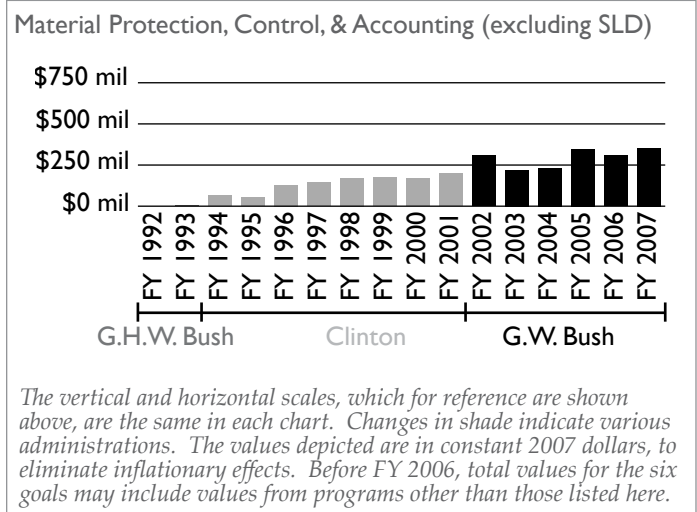


Table 1 Source: Anthony Wier, “Interactive Budget Database,” in Nuclear Threat Initiative Research Library: Securing the Bomb (Cambridge, Mass., and Washington, D.C.: Project on Managing the Atom, Harvard University, and Nuclear Threat Initiative, 2007; available at <http://www.nti.org/research/cnwm/overview/funding.asp> as of 15 February 2007).

Funding for U.S. Efforts to Improve Controls Over Nuclear Weapons, Materials, and Expertise Overseas: Recent Developments and Trends

The Bush administration's proposed fiscal year (FY) 2008 budget for cooperative threat reduction would reduce the overall funds available and launch few new initiatives or approaches to address the urgent threats posed by inadequately controlled nuclear weapons, materials, and expertise. While sustained high-level leadership to overcome obstacles to cooperation is the most important ingredient for accelerating and strengthening these efforts, additional funds would be needed to carry out the "maximum effort" to keep nuclear weapons and materials to make them out of terrorist hands that the 9/11 Commission recommended.¹

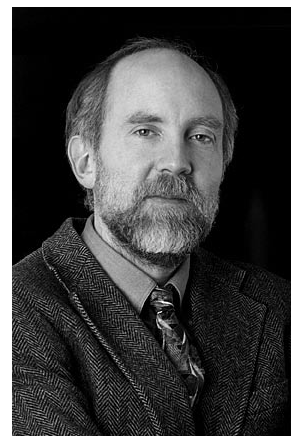
Overall, if Congress adopted the administration's proposal in its entirety, the cumulative resources available to programs focused on improving controls over nuclear weapons, materials, and expertise would decline to \$996 million, 11% below the FY 2006 level (the most recent year for which easy comparisons are available, because of congressional delays in passing appropriations bills to fund most federal programs for FY 2007). Funding for all cooperative threat reduction (which also includes efforts to control chemical and biological threats, along with dismantlement of missiles and submarines) would decrease to \$1.3 billion, 9% below the FY 2006 level.

Under the administration's proposal, the State Department's threat reduction efforts would expand to a global focus; the Global Threat Reduction Initiative (GTRI), a Department of Energy (DOE) effort to convert, secure, and clean out civilian facilities with vulnerable nuclear and radiological material, would receive significantly increased resources; and funding for biological threat reduction efforts at the Department of Defense (DOD) would be significantly increased. In contrast, DOE's Global Initiatives for Proliferation Prevention (GIPP) and DOD's Russian Nuclear Warhead Security program would be cut back in comparison to FY 2006 and FY 2007, and there would be no new funding made available for DOD's effort to help Russia destroy its chemical weapons stockpile.²

The administration released its FY 2008 budget proposal at the same time Congress and the Bush administration were finalizing funding levels for most of these efforts for FY 2007 (which ends in September 2007), even though over a third



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This publication was made possible with generous support from the Nuclear Threat Initiative. For more information, see <http://www.nti.org/securingthebomb>. All responsibility for the opinions and errors in this paper rests entirely with the authors.

Cover Image: Highly enriched uranium being removed from a vulnerable research facility. Source: U.S. Department of Energy

of the fiscal year has already passed. House Joint Resolution 20—the bill setting final congressional allocations for FY 2007 for everything the government does except national defense and homeland security (the only two departments for which the 109th Congress managed to pass appropriations bills)—largely adopts, with a few exceptions and alterations, the funding levels under which programs worked in FY 2006.³ The continuing resolution did provide modest increases over FY 2006 for two DOE threat reduction efforts: GTRI (which got an additional \$18.5 million) and the International Material Protection and Cooperation program (which got an additional \$50 million). Currently, we estimate that the overall budget available to programs working to control nuclear weapons, materials, and expertise overseas is \$1.149 billion in FY 2007, a nominal increase of just over 2% over the FY 2006 level, barely enough to keep up with inflation.

This paper examines the resources U.S. programs working to control nuclear weapons, materials, and expertise overseas will likely have available to them in FY 2007 and 2008 as the result of recent executive and legislative branch decisions. It places those recent decisions in the context of the overall budgetary trends for these programs and steps back to look at budgets for the entire U.S. cooperative threat reduction effort. We conclude the paper with recommendations for additional funding in targeted areas.

Figure I. Historical U.S. Appropriations to Improve Controls on Nuclear Weapons, Materials, and Expertise
(Constant 2007 Dollars, in Millions)

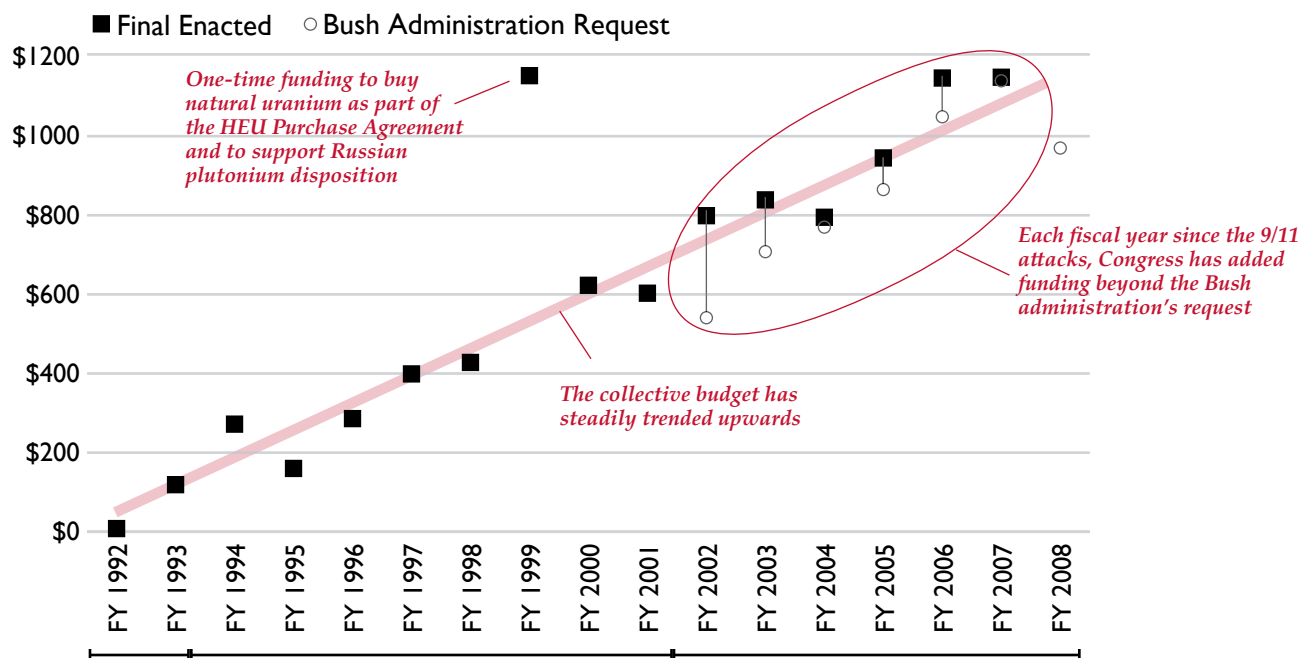


Figure 1 Source: "Interactive Budget Database," 2007.

Highlights of the FY 2008 Budget Proposal

Taking projected inflation into account, the \$996 million requested for programs to improve controls on nuclear warheads, materials, and expertise around the world would represent a real decrease of 15% over the FY 2006 level.⁴ Such a decrease would buck the trend of steadily increasing annual funding for cooperative programs to improve controls over nuclear weapons, materials, and expertise. In the years since the 9/11 attacks, Congress has repeatedly added funding beyond the administration's initial request for a number of key threat reduction programs; in the subsequent year, the administration has typically followed the Congress' lead, in broad terms (see Figure 1). While these incremental increases have often not been enough to enable the pace of the U.S. response to match the threat posed by unsecured nuclear weapons, materials, and expertise, the overall resource trend has been undeniably upward—and it is clearly not the case that Congressional budget constraints have limited the administration's ability to carry out these programs faster.



The Global Threat Reduction Initiative (GTRI) works to remove highly enriched uranium (HEU) from vulnerable facilities around the world and to convert reactors away from using HEU fuel. In July 2006, GTRI helped remove a second cache of weapons-usable HEU from this research reactor in Libya. Source: U.S. Department of Energy

Several items of note stand out in the FY 2008 budget proposal.

- As the effort to upgrade security for nuclear stockpiles in Russia nears its December 2008 target for completion, DOE is proposing to reduce new funding for the “core” Material Protection, Control, and Accounting (MPC&A) program—that is, excluding the anti-smuggling Second Line of Defense program, which the administration counts under the same budget line but that we track separately to indicate its separate mission. As detailed in Table 2, MPC&A would go from approximately \$303 million in new resources in FY 2006 to roughly \$282 million in FY 2008, a 7% reduction. DOE submitted a regular request of \$252 million for the “core” program, but the administration is also requesting \$30 million as part of its request for emergency supplemental appropriations to carry out the “Global War on Terror.” DOE attributes the bulk of the decrease to the completion of comprehensive security upgrades at five nuclear warhead storage sites overseen by Russia's Strategic Rocket Forces.⁵
- DOE is requesting an FY 2008 budget of almost \$140 million for the Global Threat Reduction Initiative (GTRI). Just under \$120 million of that request would come as a regular appropriation, while the other \$20 million is being sought as part of the administration's emergency supplemental request

Table 2. Enacted and Proposed Appropriations for the Department of Energy's Nuclear Materials Protection and Cooperation Program, FY 2006-2008

(Current Dollars, in Millions)

Program/Subprogram	FY 2006 Final	FY 2007 Estimated ¹	FY 2008 Request	Change From FY 2006	
Total, Nuclear Materials Protection and Cooperation	422.730	472.730	401.771	-20.959	-5%
Material Protection, Control, & Accounting "core" program	302.776	352.776	252.440	-50.336	-17%
Navy Complex	16.966		13.390	-3.576	-21%
Strategic Rocket Forces/12th Main Directorate	107.761		91.449	-16.312	-15%
Rosatom Weapons Complex	89.274		60.114	-29.160	-33%
Civilian Nuclear Sites	27.341		22.188	-5.153	-19%
Material Consolidation and Conversion	21.583		19.667	-1.916	-9%
National Programs and Sustainability	39.851		45.632	+5.781	+15%
Second Line of Defense	119.954	119.954	119.331	-0.623	-1%
Unallocated Supplemental Request		[49.000] ²	30.000 ³	n/a	n/a

Notes

¹ FY 2007 values are estimated pending final allocation decisions by Congress and the Bush administration.

² In February 2007, for FY 2007 the administration requested an additional \$49 million for the "core" Material Protection, Control, & Accounting program. That request awaits action by the Congress.

³ For FY 2008, the administration requested \$30 in supplemental funding for the "core" Material Protection, Control, & Accounting program.

for FY 2008. GTRI had a budget of approximately \$97 million in FY 2006, making the proposed FY 2008 total a 44% jump. As shown in Table 3, most of the increase would support the effort to safely transport and store proliferation-sensitive spent fuel in Kazakhstan, while some would also go to enhancing work to return Soviet-origin highly enriched uranium (HEU) fuel Russia for safekeeping and ultimate conversion to low enriched uranium.

- Under the proposal, DOD's Nuclear Warhead Security-Russia program would see its budget drop to just under \$23 million, compared to \$87 million in FY 2007 and \$129 million in FY 2006. DOD believes that site security enhancements will be largely completed by FY 2008, reducing the need for additional funds. The program received \$44 million in supplemental FY 2006 funding to accelerate security upgrades.⁶
- In contrast, DOD's Nuclear Warhead Transportation Security program would receive an increase of almost \$5 million over FY 2007, for a total of \$38 million. The additional funds would allow the program to procure up to four extra railcars to transport Russian warheads securely to storage or dismantlement facilities.
- The program to dispose of excess Russian weapons plutonium would receive no new money in FY 2008; it had received \$34 million in new funding in FY

Table 2 Source: U.S. Department of Energy, FY 2008 Congressional Budget Request: National Nuclear Security Administration-Defense Nuclear Nonproliferation, vol. 1, DOE/CF-014 (Washington, D.C.: DOE, 2007; available at http://www.cfo.doe.gov/budget/08budget/Content/Volumes/Vol_1_NNSA.pdf as of 7 February 2007), p. 471.

2006. The program has been relying on \$225 million in funds provided in FY 1999, and is not requesting additional funds, as it had in several past years, to support ongoing operations.

- DOE's Global Initiatives for Proliferation Prevention would see a significant decrease in annual funding under the FY 2008 budget proposal. The program is requesting just over \$20 million, in nominal terms almost half of its almost \$40 million budget for FY 2006. Less funding is being sought because of the demise of the Nuclear Cities Initiative, which resulted from U.S. and Russian failure, in September 2006, to renew the NCI implementing agreement.
- The State Department's FY 2008 request proposes to change the name and the scope of a budget item that used to be known as the Nonproliferation of WMD Expertise program. Now named the Global Threat Reduction Program, the effort is designed to reduce risks of proliferation of nuclear, chemical, and biological expertise and materials around the world. The new global focus, with little increase in requested resources, appears likely to lead to cutbacks in funding for the International Science and Technology Centers in the former Soviet Union, U.S. funding for which comes from this program. Little information has been released as to what methods this effort would use, what targets it would aim for, how much it would ultimately cost, or how it will relate to other programs, though it appears that the primary focus, at least initially, would be on expertise and on biological materials.

Table 3. Enacted and Proposed Appropriations for the Department of Energy's Global Threat Reduction Initiative, FY 2006-2008

(Current Dollars, in Millions)

Program/Subprogram	FY 2006 Final	FY 2007 Estimated ¹	FY 2008 Request	Change From FY 2006	
Total, Global Threat Reduction Initiative	96.995	115.495	139.626	+42.631	-5%
Reduced Enrichment for Research and Test Reactors (RERTR)	24.732		31.190	+6.458	+26%
Russian Research Reactor Fuel Return (RRRFR)	14.703		31.046	+16.343	+111%
U.S. Foreign Research Reactor Spent Nuclear Fuel (FRRSNF)	8.100		4.211	-3.889	-48%
Emerging Threats and Gap Materials	5.000		1.721	-3.279	-66%
U.S. Radiological Threat Reduction (USRTR)	12.566		13.228	+0.662	+6%
Kazakhstan (BN-350 Reactor) Spent Fuel	8.000		31.722	+23.722	+296%
Global Research Reactor Security	0.000		0.500	+0.500	n/a
International Radiological Threat Reduction (IRTR)	23.894		6.008	-17.886	-75%
Unallocated Supplemental Funding ²	n/a	[14.000]	20.000	n/a	n/a

Notes

¹ FY 2007 value is estimated pending final allocation decisions by Congress and the Bush administration.

² In February 2007, the administration requested \$14 million for FY 2007 and \$20 million for FY 2008 for the Global Threat Reduction Initiative. Congress has yet to act on those requests.

**Figure 2. Components of Departments of Energy, State, and Defense
FY 2008 Budget Requests Devoted to Cooperative Threat Reduction Programs**
(each full box represents \$1 billion)

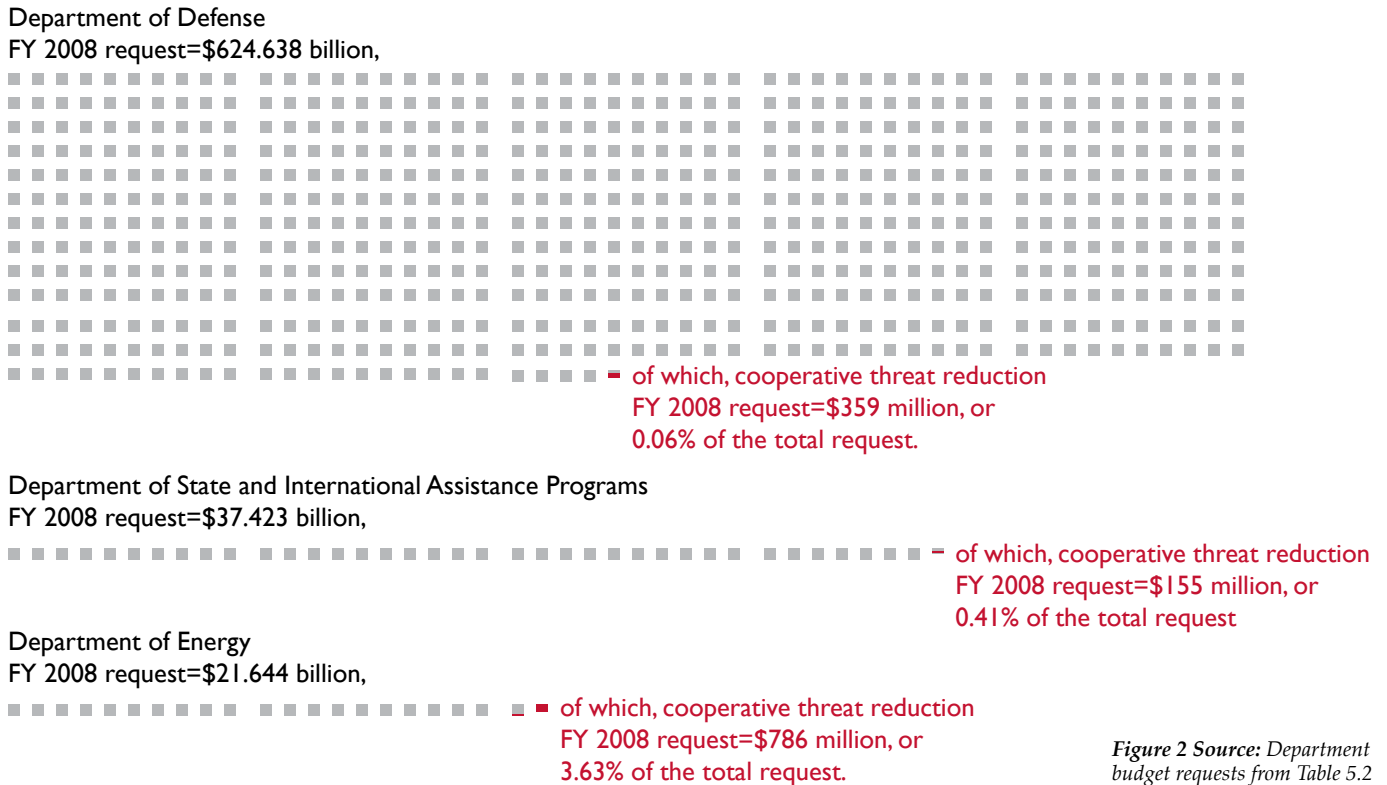


Figure 2 Source: Department budget requests from Table 5.2 in U.S. Office of Management and Budget, "Historical Tables," Fiscal Year 2008 Budget of the United States Government (Washington, D.C.: OMB, 2007; available at <http://www.whitehouse.gov/omb/budget/fy2008/> as of 5 February 2007). Department totals include OMB estimates of supplemental funding requests for FY 2008.

The effort includes, however, a Nuclear Security Outreach Initiative that has begun carrying out assessments of nuclear security improvement needs (ranging from physical protection to anti-smuggling measures) in several countries.

Several other programs would see slight changes in their budgets, as noted in Table 1.

While this paper examines the cumulative resources available for these programs throughout the government, it is important to understand that at no point in the annual budget process does the government itself consider the budgets for all of these programs collectively. The Departments of Energy, Defense, and State each follow separate tracks toward their final budget numbers. Budget tradeoffs are generally made within each department, and each budget is set by separate appropriations subcommittees in both the House and Senate. In the FY 2008 budget submission, DOD programs are responsible for most of the cumulative reduction in resources from FY 2006. In comparison to our estimate for FY 2007, DOE programs look like the biggest losers, but those reductions come from resource levels that are higher in FY 2007 than they were in FY 2006. The resources available to programs at the State Department would be little changed by the proposal for FY 2008.

It is important to understand how small the budgets for cooperative threat reduction programs are in comparison to the departments that house them, as Figure 2 shows. Without serious effort by departmental leadership, it would be—indeed, it has been—very easy for these programs to get lost in the shuffle of these departments' other concerns and decisions. At the same time, the targeted additional resources recommended in this paper would not dramatically alter these agencies' budgetary bottom lines, a fact that should make such recommendations easier to swallow. What is more, with the aftermath of the 9/11 attacks as a guide, the additional resources recommended below would certainly pale in comparison to the growth in these departments' budgets that would follow a terrorist attack with a nuclear, chemical, or biological weapon.

Review of FY 2007 Budget Outcomes

A tumultuous budget process for FY 2007 has tentatively resulted in a slight cumulative increase over the previous year in the resources available to programs aimed at improving controls over nuclear weapons, materials, and expertise overseas. As noted above, House and Senate leaders only finalized negotiations on funding legislation in late January 2007. The 109th Congress had failed to complete nine of the eleven annual spending bills before it finished work after the November 2006 congressional election (only the defense and homeland security funding bills were completed). The outgoing 109th Congress instead provided provisional funding through February 15, 2007. As a result, Congress and the president had to complete work on the legislation early in the 110th Congress, lest most of the federal government's activities be interrupted.

It is important to note that, while Congress largely adopted the FY 2006 budget levels in the bill funding the remainder of FY 2007, it also provided the administration with leeway in allocating budgets among programs within a given appropriation account. (All of the DOE nonproliferation programs, for example, are in a single appropriation account.) As a result, the estimates provided here for FY 2007 for individual threat reduction programs at the Departments of Energy and State—which use FY 2006 as their guide—are tentative, pending final executive branch decisions.

In addition, at the same time the administration submitted its budget proposal and supplemental request for FY 2008, it also transmitted a request for supplemental funds for FY 2007. The request included \$49 million in additional funds for the line that funds both the MPC&A program and the Second Line of Defense effort, and \$20 million in additional funds for GTRI.

With these warnings in mind, as of February 2007 the estimated appropriation for programs for improving controls over nuclear warheads, materials, and expertise overseas is \$1.149 billion for FY 2007, an increase of \$26 million over FY 2006 and some \$80 million compared to the administration's original FY 2007 request. If one accounts for estimates of the rising costs of

domestic goods and services, that cumulative total represents virtually no real increase in resources over the previous year.

As with the FY 2008 budget proposal, changes in the overall level are spread unevenly among several programs.

- In the final FY 2007 funding bill, House and Senate appropriators made a special point of adding \$50 million beyond the FY 2006 level to the Material Protection, Control, and Accounting (MPC&A) budget line (for most programs in the government, the bill merely adopted the FY 2006 level without comment). DOE plans to spend these funds on the MPC&A “core” program (rather than the Second Line of Defense effort funded from the same budget line), raising the MPC&A program’s budget for FY 2007 to \$353 million, almost \$64 million more than the administration had originally requested for FY 2007. DOE officials report that the additional funds will pay for secure trucks to transport weapons-usable nuclear material and for upgrades at Strategic Rocket Forces warhead sites that Russia opened for cooperation after the FY 2007 budget request was prepared, as well as easing pressures created by increases in labor and construction costs in Russia since those budget decisions were made. The Second Line of Defense program will have an estimated \$120 million, the same as in FY 2006. As noted above, the emergency supplemental request for FY 2007 includes an additional \$49 million for this budget line. DOE officials indicate that these funds would also go to the MPC&A effort, paying for upgrades at key buildings Russia only recently made available for cooperation at major Russian nuclear weapons facilities, and for additional upgrades outside the Soviet Union.⁷
- The 110th Congress also specifically added \$18.5 million over the FY 2006 level for the Global Threat Reduction Initiative, meaning the effort will have just over \$115 million available for FY 2007. In its initial FY 2007 budget request the administration sought slightly under \$107 million for the program, while the House, in the 109th Congress, had initially voted to provide nearly \$148 million for FY 2007.
- In the stand-alone funding bill for the Department of Defense (DOD), which the 109th Congress passed and the president signed into law before the start of FY 2007, Congress adopted the administration’s funding request for DOD cooperative threat reduction programs. In early 2006, Congress provided \$44.5 million in supplemental FY 2006 funding for DOD’s Cooperative Threat Reduction program, in response to an administration request for additional funds for the Nuclear Weapons Storage Security program, which is working with the Russian Ministry of Defense to enhance security at



DOE’s Second Line of Defense program installs radiation detection equipment around the world at key border crossings and major shipping ports (or “megaports”) to detect the movement of nuclear or radiological materials. Budgets for the program have increased significantly since the 9/11 attacks. Source: U.S. Department of Energy

Russian nuclear weapons storage sites. As a result of the supplemental, the \$87 million provided for FY 2007 (at the request of the administration) looks like a reduction, when in fact that amount is higher than the \$84 million the program originally had received in FY 2006. The closely linked DOD program for Nuclear Weapons Transportation Security in Russia received \$33 million for FY 2007, as opposed to \$30 million in FY 2006.

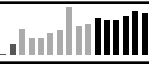



- DOD's WMD Proliferation Prevention program, another program working to enhance other countries' capacity to interdict nuclear and other weapons of mass destruction smuggling, has a budget of just over \$37 million in FY 2007, as opposed to a FY 2006 budget of \$41 million.
- Congress chose not to add FY 2007 funding for any other programs from the Departments of Energy and State, though as noted above, the executive branch will enjoy unusual leeway in allocating funding among programs within appropriations accounts. As a result, the final funding levels may differ from estimates based on the FY 2006 level. If the administration chooses to exercise its option to increase some programs, other programs will have to be cut—even though some programs are already facing budgets lower than they had planned for. For example, excluding the amounts Congress has required be spent on the MPC&A and GTRI efforts, DOE will have broad discretion to allocate nearly \$1.1 billion in the Defense Nuclear Nonproliferation account. Unfortunately for DOE, in its initial FY 2007 request it had sought over \$1.2 billion for the programs other than MPC&A and GTRI that the Defense Nuclear Nonproliferation account funds.

Besides the resource additions or subtractions resulting from the unusual FY 2007 appropriations process, the delays and uncertainty of the FY 2007 process have complicated the work being done to control nuclear weapons, materials, and expertise. So long as Congress and the president had yet to complete final funding legislation, programs could only spend a proportional amount of the lowest possible level at which funding might have been approved, namely, the lowest of the FY 2006 level, the level approved by the full House, and, when it managed to do so, the level approved by the full Senate. This inhibited contracting, overseas travel, and other program execution. At the same time, budget planning for the next fiscal year in the executive branch is finalized in the first months of the preceding fiscal year. Delays in the FY 2007 process therefore upended planning for FY 2008 and beyond, because programs did not have a clear understanding of the resources they would have available to carry out their work.

Total Cooperative Threat Reduction Funding

As noted earlier, annual funding for cooperative programs working to reduce the threat of nuclear terrorism has trended mostly upward. That funding trend has driven overall cooperative threat reduction funding upward—that is, the budgets that include not only efforts to improve controls over nuclear

Table 4. U.S. Appropriations for Cooperative Threat Reduction, by Department
(Current Dollars, in Millions)

Department	FY 1992- FY 2007 Real Funding	FY 2006 Final	FY 2007 Estimated ¹	FY 2008 Request	Change From FY 2006	
Total, Cooperative Threat Reduction		1,433	1,422	1,300	-133	-13%
Department of Energy		809	877 ²	786	-23	-3%
Department of Defense		462	383	359	-103	-22%
Department of State		162	162	155	-7	-5%

Notes

Values may not add due to rounding. The vertical and horizontal scales are the same in each chart. Changes in shade indicate various administrations. The values depicted are in constant 2007 dollars, to eliminate inflationary effects.

¹ FY 2007 values are estimated pending final allocation decisions by Congress and the Bush administration.

² In February 2007, for FY 2007 the administration also requested an additional \$49 million to be split between the Material Protection, Control, & Accounting program and the Second Line of Defense program, as well an additional \$14 million for the Global Threat Reduction Initiative. That request has yet to be acted upon, and is not included in this total.

Table 4 Source: "Interactive Budget Database," 2007.

weapons, materials, and expertise, but also efforts to control biological and chemical threats and to dismantle missiles, bombers, and submarines.⁸ When funding for programs mostly focused on the nuclear threat are removed, the recent annual funding trend for these other cooperative threat reduction efforts has been downward, particularly when inflation in the costs of goods and services is taken into account.

Overall, from FY 1992—when funding for cooperative threat reduction efforts first got underway—through FY 2007, the U.S. Government has budgeted nearly \$13.3 billion in nominal dollars for cooperative threat reduction programs. In real terms, that would amount to over \$15.5 billion in 2007 dollars.

For FY 2008, the administration has requested a total cooperative threat reduction budget of \$1.300 billion, as shown in Table 4. That would represent an 8% decrease from the previous year's estimated level (over 10% if one accounts for inflation). Beyond the key movers discussed among nuclear-oriented programs, the biggest proposed changes would come in the following programs:

- DOD is not requesting any more funding for the Chemical Weapons Destruction Facility in Russia. In FY 2007 DOD received the last \$43 million in funding that it intends to spend on chemical weapons destruction in the former Soviet Union. The job of destroying chemical weapons left over from the Soviet stockpile has received approximately \$1.1 billion since the Nunn-Lugar program began (about \$1.3 billion in 2007 dollars).
- Instead, DOD is proposing to direct significant resources in FY 2008 to its Biological Threat Reduction program in the former Soviet Union, which

works to consolidate and secure dangerous pathogens and improve on the safety and security practices of biological facilities. The proposed budget of \$144 million for FY 2008 would double the amount of resources available for the program, even though DOD admits that its “effort in Russia is very limited due to Russian aversion to cooperate on biological threat reduction.”⁹

- The State Department’s Nonproliferation and Disarmament Fund, which supports *ad hoc* operations to fulfill a nonproliferation or disarmament mission for which other U.S. Government funding is not available, would see its annual replenishment fall from over \$37 million in FY 2006 to \$30 million in FY 2008.

As with programs focused on the nuclear threat, several other cooperative threat reduction programs would see slight changes in their FY 2008 budget, as shown in Table 5.

Table 5. U.S. Appropriations for Cooperative Threat Reduction

(Current Dollars, in Millions)

Goal/Program	FY 1992- FY 2007 Real Funding	Department	FY 2006 Final	FY 2007 Estimated ¹	FY 2008 Request	Change From FY 2006	
Total, Cooperative Threat Reduction			1,433	1,422	1,300	-133	-9%
Improve Controls over Nuclear Weapons, Material, & Expertise			1,123	1,149	996	-127	-11%
Other Threat Reduction			310	273	304	-6	-2%
Biological Threat Reduction Program - Former Soviet Union ²	Defense	70	68	144	+75	+107%
Strategic Offensive Arms Elimination - Russia	Defense	50	76	78	+28	+57%
Chemical Weapons Destruction Facility - Russia	Defense	109	43	0	-109	-100%
Other Threat Reduction/Administrative Support	Defense	15	18	19	+4	+30%
Defense-Military Contacts	Defense	8	8	8	0	0%
Strategic Nuclear Arms Elimination - Ukraine	Defense	1	1	0	-1	-100%
Arctic Military Environmental Cooperation	Defense	>0	1	0	-0	-100%
Nonproliferation and Disarmament Fund	State	37	37	30	-7	-19%
Georgia Border Security and Law Enforcement Assistance ³	State	15	15	15	0	0%
International Nonproliferation Export Control Cooperation	Energy	6	6	10	+4	+64%

Notes

Values may not add due to rounding. The vertical and horizontal scales are the same in each chart. Changes in shade indicate various administrations. The values depicted are in constant 2007 dollars, to eliminate inflationary effects. Before FY 2006, total values for goals may include values from programs other than those listed here.

¹ FY 2007 values for Department of Energy and State programs are estimated pending final allocation decisions by Congress and the Bush administration.

² In the explanation of the FY 2008 budget request, DOD noted this new name for the program that had been known as the Biological Weapons Proliferation Prevention program.

³ All values for this program are estimates based on prior year appropriations, pending further information from the State Department.

Conclusions and Recommendations

This paper has focused on the resources the administration's budget proposal would make available for threat reduction. But what one is buying is usually more important than what one is paying. Resource levels only serve as proxies for how much work might be attempted in the coming year; they offer little information on the real progress achieved as a result of those resources. (The annual *Securing the Bomb* series focuses on the results achieved, and gaps remaining.¹⁰)

After over a decade of experience, the overall record of programs working to improve controls over nuclear weapons, materials, and expertise overseas—and of cooperative threat reduction in general—is clear: the resources provided have bought dramatic results, at a price dramatically lower than other national security and foreign policy programs. As a whole, these programs have dramatically reduced the nuclear, chemical, biological, and missile threat facing the United States. Targeted, well-crafted additions to the resources already available promise to provide even greater contributions to the national security of the United States.

To seize all of the opportunities that are already open for improving security for nuclear stockpiles or interdicting nuclear smuggling would require additional investments in several programs in both FY 2007 and FY 2008:

- **GTRI.** GTRI urgently needs additional funds for several efforts: providing incentives to convince vulnerable sites to convert from HEU to LEU and allow their HEU stocks to be removed; carrying out security upgrades at HEU-fueled research reactors (currently budgeted for only \$0.5 million in FY 2008, far less than the amount needed to carry out substantial upgrades at a single site); covering a broader segment of the potentially dangerous “gap” HEU and plutonium stocks around the world not covered by existing programs (currently budgeted for only \$1.7 million in FY 2008); and addressing potentially deadly radiological sources (where the FY 2008 request is just over one quarter of the resources available in FY 2006, and crucial work to secure especially high-risk sources, such as Russian radiothermoelectric generators (RTGs) is being slowed by lack of funds). Congress should consider a supplemental appropriation for GTRI in the range of \$50 million for FY 2007 (rather than the \$14 million the administration has requested), and a total appropriation for FY 2008 in the range of \$180 to \$200 million (rather than the \$139.6 million the administration has requested).
- **Nuclear forensics.** An improved ability to determine where nuclear material came from—either after a seizure or after a terrorist nuclear event—could help deter hostile states from transferring nuclear material to terrorists. The administration has requested \$12 million for nuclear forensics research and development in FY 2008, but that is only enough to support a very modest research effort (our charts do not reflect this funding because, even though

this effort is critical for the overall effort of preventing nuclear terrorism, it is not a task that directly improves controls over nuclear weapons and materials overseas). Congress should consider an appropriation in the range of \$50 million for FY 2008, and should also examine the possibility of supplemental funding in FY 2007 to kick-start current efforts.

- MPC&A.** As noted earlier, both the \$50 million increase for FY 2007 that Congress granted the MPC&A program in the continuing resolution and the administration's \$49 million supplemental FY 2007 request for this effort are urgently needed. These funds will make it possible to seize opportunities to secure vulnerable nuclear material transports, upgrade security for additional Russian nuclear warhead sites, improve security measures at key buildings in Russia's nuclear weapons complex, and continue needed nuclear security upgrades outside of the former Soviet Union. Still more funds may be needed, for several reasons. First, prices for both labor and materials in Russia continue to increase—more quickly in some cases than envisioned in budget plans. Second, as this effort moves toward its 2008 target for completing upgrades in Russia and plans for the transition to Russia and the other former Soviet states maintaining high levels of nuclear security on their own, additional funds are needed to work with these states to ensure that effective security systems will be sustained (especially in the case of nuclear warhead sites, where less effort has so far been made in preparing for this transition). Third, more resources are likely to be required to improve regulation of nuclear security and accounting (a critically important factor, as most nuclear managers will only invest in the security measures the government requires them to take) and to strengthen security culture. Fourth, there are many aspects of security only the recipients of international assistance can control, from providing effective guard forces to combating the extensive corruption and insider theft that plagues these nations and their nuclear establishments; while these states must pay for these matters themselves, more funds may be needed to convince them, and help them, to do so. Fifth, as additional opportunities open up in states such as China and India (where progress may finally be possible as broader civilian nuclear cooperation is established), more money will be needed to pursue them. Congress should ask the administration whether additional funds in FY 2007 and FY 2008 would make it possible to seize additional opportunities to reduce nuclear terrorism risks.
- UN Security Council Resolution (UNSCR) 1540 implementation.** UNSCR 1540 legally requires every country in the world to provide "appropriate effective" security and accounting for any stocks of nuclear, chemical, or biological weapons or the materials to make them they may have; appropriate effective

U.S. funds support equipment upgrades—like this access control gate—at nuclear facilities not only in the former Soviet Union, but around the world. Terrorists will likely seek nuclear material wherever it is easiest to steal; nuclear material does not need to be stamped "Made in Russia" to be used in a terrorist nuclear weapon. Source: U.S. Department of Energy.



export controls; appropriate effective border and transshipment controls; and more. This resolution was designed to be a key element in the effort to keep weapons of mass destruction out of the hands of terrorists, yet efforts to follow through are only beginning, and at an absurdly small scale. The United States should be doing much more to make use of this new nonproliferation tool, working with leading states and international organizations on several central aspects of UNSCR 1540 implementation: defining the essential elements of effective systems in each of these areas; assessing how well states are implementing those essential elements; and pressuring (and helping) states to meet these critical new legal obligations. The A.Q. Khan network, which operated in dozens of countries around the world, demonstrated how critical it is that all states put such controls in place. Congress should consider providing \$50 million in supplemental funding in FY 2007 and a larger sum in FY 2008 to finance State Department and DOE efforts to work with countries around the world to ensure that these critical obligations are met.

- **International Atomic Energy Agency (IAEA) Office of Nuclear Security.** The IAEA has a critical role to play in preventing nuclear terrorism, providing international guidelines, training, and peer reviews, and managing the international database of nuclear smuggling incidents. Many countries that may be suspicious of U.S. assistance are willing to work with the IAEA. Yet all of the IAEA's efforts are constrained by chronically short budgets, most of which can be spent only on particular projects designated by donor states, leaving little available to respond quickly to events. Congress should consider providing an additional \$10 million in supplemental funding for the U.S. contribution to the IAEA Office of Nuclear Security in FY 2007, and comparable increases in FY 2008. Congress should give the IAEA the latitude to spend these funds where they are most needed in the fight against nuclear terrorism, but should consider tying the funds to improved metrics of progress and performance in meeting them.
- **Expanded blend-down of HEU.** The current agreement under which the United States purchases LEU blended from 30 tons of Russian weapons HEU each year, for use as commercial reactor fuel, will come to an end in 2013. At that time, Russia will still have hundreds of tons of HEU beyond any plausible military need (though not all of it may be 90% enriched, as the material currently being blended is). Congress should consider providing a conditional appropriation in the range of \$200 million to support providing incentives to convince Russia to blend down large quantities of additional HEU—both to achieve the national security benefit of destroying this potential bomb material, and to ease the pressure on nuclear fuel markets.

In addition to these additional appropriations specifically targeted on reducing threats of nuclear terrorism, there are also broader threat reduction efforts that appear to require additional funds:

- **Contributions to an International Nuclear Fuel Bank.** Uranium enrichment and spent fuel reprocessing are the key technologies that make it possible to produce material for nuclear weapons. To help convince countries pursuing nuclear energy programs that they can rely on foreign supplies of fuel and do not need to establish their own enrichment and reprocessing capabilities, a variety of international fuel supply assurance proposals are being pursued. In particular, the IAEA is working to establish a fuel bank upon which countries that forgo enrichment or reprocessing technology could call in the event their nuclear fuel supplies are cut off. The Nuclear Threat Initiative, backed by Warren Buffett, has offered \$50 million toward the establishment of such a bank, if that \$50 million is matched by \$100 million from governments or other sources within the next two years. Congress should consider providing a conditional appropriation of \$50 million to support a fuel bank, as proposed in legislation sponsored by Rep. Tom Lantos, once the IAEA and other fuel suppliers work out arrangements for the bank and other countries contribute \$50 million toward creating the bank.
- **Chemical weapons destruction.** The president's budget proposal includes no additional funds for destroying Russia's vast chemical weapons stockpile. Although prior-year funding represents all of the funds the United States had planned to provide for the Shchuch'ye nerve gas destruction facility, cost estimates for the facility have increased, and it remains important to complete a facility capable of carrying out the full mission; cutting off funding now could result in an expensive white elephant that never in fact destroys the deadly chemical weapons at Shchuch'ye.
- **Global control of nuclear, chemical, and biological expertise.** As noted earlier, the State Department's efforts to expand its threat reduction programs globally without a major increase in resources is resulting in cutbacks in science support in the former Soviet Union. Similarly, as noted earlier, DOE's expertise-related efforts are being cut back with the demise of the Nuclear Cities Initiative. Congress should consider a larger investment in controlling critical information and expertise related to nuclear, chemical, and biological weapons worldwide. At the same time it should closely examine the true impact these programs are able to have on the threat that expertise will proliferate.

In short, while much has been accomplished in securing and reducing nuclear stockpiles around the world and cooperatively reducing other mass-destruction threats, much more remains to be done. Modest additional investments in FY 2007 and FY 2008 could significantly contribute to reducing the risk of nuclear terrorism.

Notes

¹ National Commission on Terrorist Attacks upon the United States, *The 9/11 Commission Report: Final Report of the National Commission on Terrorist Attacks Upon the United States*, 1st ed. (New York: Norton, 2004; available at <http://www.gpoaccess.gov/911/index.html> as of 30 December 2006).

² These figures are recorded in Anthony Wier, "Interactive Budget Database," in *Nuclear Threat Initiative Research Library: Securing the Bomb* (Cambridge, Mass., and Washington, D.C.: Project on Managing the Atom, Harvard University, and Nuclear Threat Initiative, 2007; available at http://www.nti.org/e_research/cnwm/overview/funding.asp as of 15 February 2007). Users can use this database to compile custom charts on the cooperative threat reduction goals, agencies, and programs of their choice. For a discussion of which programs are counted in our totals, see Anthony Wier, "Funding Summary," in *Nuclear Threat Initiative Research Library: Securing the Bomb* (Cambridge, Mass., and Washington, D.C.: Project on Managing the Atom, Harvard University, and Nuclear Threat Initiative, 2006; available at http://www.nti.org/e_research/cnwm/overview/funding.asp as of 7 February 2007). It should be noted that many programs related to controlling expertise or interdicting smuggling cover chemical, biological, and missile technologies as well as nuclear technologies, and hence, by including the full budgets for these programs, we inevitably overestimate somewhat the total budget that is specifically for controlling nuclear warheads, materials, and expertise. Except where noted, figures are taken from the following budget documents: U.S. Department of Defense, *Fiscal Year (FY) 2008 Budget Estimates: Former Soviet Union Threat Reduction* (Washington, D.C.: U.S. Department of Defense, 2007; available at http://www.dod.mil/comptroller/defbudget/fy2008/budget_justification/index.html as of 7 February 2007); U.S. Department of Energy, *FY 2008 Congressional Budget Request: National Nuclear Security Administration—Defense Nuclear Nonproliferation*, vol. 1, DOE/CF-014 (Washington, D.C.: DOE, 2007; available at http://www.cfo.doe.gov/budget/08budget/Content/Volumes/Vol_1_NNSA.pdf as of 7 February 2007); U.S. Department of State, *Summary and Request: International Affairs Function 150 FY 2008 Budget Request* (Washington, D.C.: U.S. Department of State, 2007; available at <http://www.state.gov/documents/organization/80151.pdf> as of 6 February 2007); U.S. Office of Management and Budget, *Fiscal Year 2008 Budget of the United States Government* (Washington, D.C.: OMB, 2007; available at <http://www.whitehouse.gov/omb/budget/fy2008/> as of 5 February 2007).

Other organizations have also created useful analyses of aspects of the FY 2008 budget request related to arms control and nonproliferation. For instance, see Center for Arms Control and Nonproliferation, "Department of Energy Budget Request for FY 2008 - Nuclear Non-Proliferation Highlights" (Washington, D.C.: Center for Arms Control and Nonproliferation; available at <http://www.armscontrolcenter.org/archives/002281.php> as of 26 February 2007). Also, the Partnership for Global Security (<http://www.partnershipforglobalsecurity.org/>) will have a summary available, though it was not yet available at the time of this writing.

³ For the details of the legislation, see U.S. House of Representatives, *Making Further Continuing Appropriations for the Fiscal Year 2007, and for Other Purposes*, 110th Congress, 1st Session, H.J.Res. 20 (2007; available at <http://thomas.loc.gov/cgi-bin/bdquery/z?d110:h.j.res.20> as of 15 February 2007).

⁴ To adjust for inflation, we have used the Total Composite Outlay Deflator from Table 10.1, in the Historical Tables section of U.S. Office of Management and Budget, *FY 2008 Budget of the U.S. Government*.

⁵ U.S. Department of Energy, *FY 2008 Defense Nuclear Nonproliferation Budget Request*, p. 482.

⁶ For the explanation, see U.S. Department of Defense, *FY 2008 CTR Budget Justification*, p. 924.

⁷ Interview with DOE official, February 2007.

⁸ By "cooperative threat reduction," we include not only the original program at the Department of Defense often referred to as the Cooperative Threat Reduction program, or the Nunn-Lugar program, after the senators who launched the effort in 1991, but also programs funded by the Departments of Energy and State working towards the same goal. Calculating total funding for these efforts involves a large number of choices about what programs to include and not to include; as a result, numbers from different sources are sometimes quite different. We include a number of small programs that are sometimes left out in the administration's accountings of threat reduction spending, but at the same time, we do not include as threat reduction DOE's spending on eliminating its own excess stockpiles of HEU and plutonium (an effort included in DOE's nonproliferation budget, and sometimes included in overall threat reduction tallies). To be consistent, if U.S. efforts to control and reduce U.S. stockpiles were to be included, then U.S. expenditures on dismantling U.S. missiles and submarines, securing U.S. warheads and materials, destroying U.S. chemical weapons, and the like should also be included in the total. For more detail on what is included in our totals, see Anthony Wier, "Funding Summary," in *Nuclear Threat Initiative Research Library: Securing the Bomb* (Cambridge, Mass., and Washington, D.C.: Project on Managing the Atom, Harvard University, and Nuclear Threat Initiative, 2006; available at http://www.nti.org/e_research/cnwm/overview/funding.asp as of 7 February 2007). We use a broad definition of cooperative threat reduction that includes some funds the Bush administration does not count in its contributions towards the Group of Eight industrial nations' Global Partnership against the Spread of Weapons of Mass Destruction.

⁹ U.S. Department of Defense, *FY 2008 CTR Budget Justification*, p. 915.

¹⁰ For our most recent edition, see Matthew Bunn and Anthony Wier, *Securing the Bomb 2006* (Cambridge, Mass.: Project on Managing the Atom, Harvard University, and Nuclear Threat Initiative, 2006; available at <http://www.nti.org/securingthebomb> as of 26 February 2007).

Key References

- Bunn, Matthew, and Anthony Wier, *Securing the Bomb 2006* (Cambridge, Mass.: Project on Managing the Atom, Harvard University, and Nuclear Threat Initiative, 2006; available at <http://www.nti.org/securingthebomb> as of 23 July 2006).
- Center for Arms Control and Nonproliferation, "Department of Energy Budget Request for FY 2008 - Nuclear Non-Proliferation Highlights" (Washington, D.C.: Center for Arms Control and Nonproliferation; available at <http://www.armscontrolcenter.org/archives/002281.php> as of 26 February 2007).
- U.S. Department of Defense, *Fiscal Year (FY) 2008 Budget Estimates: Former Soviet Union Threat Reduction* (Washington, D.C.: U.S. Department of Defense, 2007; available at http://www.dod.mil/comptroller/defbudget/fy2008/budget_justification/index.html as of 7 February 2007).
- U.S. Department of Energy, *FY 2008 Congressional Budget Request: National Nuclear Security Administration – Defense Nuclear Nonproliferation*, vol. 1, DOE/CF-014 (Washington, D.C.: DOE, 2007; available at http://www.cfo.doe.gov/budget/08budget/Content/Volumes/Vol_1_NNSA.pdf as of 7 February 2007).
- U.S. Department of State, *Summary and Request: International Affairs Function 150 FY 2008 Budget Request* (Washington, D.C.: U.S. Department of State, 2007; available at <http://www.state.gov/documents/organization/80151.pdf> as of 6 February 2007).
- U.S. House of Representatives, *Making Further Continuing Appropriations for the Fiscal Year 2007, and for Other Purposes*, 110th Congress, 1st Session, H.J.Res. 20 (2007; available at <http://thomas.loc.gov/cgi-bin/bdquery/z?d110:h.j.res.20> as of 15 February 2007).
- U.S. Office of Management and Budget, *Fiscal Year 2008 Budget of the United States Government* (Washington, D.C.: OMB, 2007; available at <http://www.whitehouse.gov/omb/budget/fy2008/> as of 5 February 2007).
- Wier, Anthony, "Funding Summary," in *Nuclear Threat Initiative Research Library: Securing the Bomb* (Cambridge, Mass., and Washington, D.C.: Project on Managing the Atom, Harvard University, and Nuclear Threat Initiative, 2006; available at http://www.nti.org/e_research/cnwm/overview/funding.asp as of 7 February 2007).
- , "Interactive Budget Database," in *Nuclear Threat Initiative Research Library: Securing the Bomb* (Cambridge, Mass., and Washington, D.C.: Project on Managing the Atom, Harvard University, and Nuclear Threat Initiative, 2007; available at http://www.nti.org/e_research/cnwm/overview/funding.asp as of 15 February 2007).

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