

# **PREVENTING NUCLEAR TERRORISM: A PROGRESS UPDATE**

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**Matthew Bunn**

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**PROJECT ON MANAGING THE ATOM  
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**Project on Managing the Atom  
Belfer Center for Science and International Affairs**

John F. Kennedy School of Government  
Harvard University  
79 JFK Street  
Cambridge, MA 02138  
Fax: (202) 495-8963  
Email: [atom@harvard.edu](mailto:atom@harvard.edu)  
Web: <http://www.ksg.harvard.edu/bcsia/atom>

**Nuclear Threat Initiative**

1747 Pennsylvania Avenue NW, 7th Floor  
Washington D.C. 20006  
Fax: (202) 296-4811  
Email: [contact@nti.org](mailto:contact@nti.org)  
Web: <http://www.nti.org>

Copies of this paper, and a wide range of additional information, are available at  
<http://www.nti.org/cnwm>

## PREVENTING NUCLEAR TERRORISM: A PROGRESS UPDATE

In the past year, there has been notable progress in ensuring that stockpiles of the essential ingredients of nuclear weapons around the world are secured from theft and transfer to terrorists. But there remains a dangerous gap between the pace of progress and the scope and urgency of the threat – a gap that, if left unfilled, could lead to unparalleled catastrophe. We must close the gap – to take action *now* that, within a few years, could reduce the danger that terrorists might turn the heart of a U.S. city into a new Hiroshima to a fraction of what it is today. This paper is intended to outline the continuing threat; summarize the progress made in addressing it in the past year, and the gaps that still remain; and recommend steps to close the gap between threat and response. The terrorists who have sworn to kill Americans wherever they can be found have undertaken an intensive effort to get a nuclear bomb, or the materials and expertise needed to make one. We need to be racing as fast as we can to stop them before they succeed. This paper is about steps to win that race.

### *A Continuing Threat*

The danger that nuclear weapons or the materials and expertise needed to make them might fall into terrorist hands remains very real. Indeed, it is difficult to say whether, over the last year, the threat has decreased or increased – because there are both positive and dangerous trends underway.

In Russia, where much of the security system for the world's largest stockpiles of nuclear weapons and materials collapsed when the Soviet Union collapsed, the trend is clearly in the right direction. The Russian economy and government have stabilized, so that nuclear workers are paid a living wage, on time (reducing the desperation that can lead to theft), and security upgrades are proceeding, albeit slowly (both as a result of Russia's own efforts and as part of U.S.-Russian cooperation).<sup>1</sup> Corruption and theft continue to be deep-rooted problems in Russia, however, including in the military and in the nuclear sector, and dangerous incidents continue to occur: in August 2003, for example, Alexander Tyulyakov, deputy director of Atomflot, the state-owned firm that maintains Russia's nuclear-powered icebreakers, was arrested and 1.1 kilograms (nearly two and a half pounds) of stolen uranium and radium was seized. While there has been no suggestion that this was material that could have been used to make a nuclear bomb, Atomflot handles tons of weapons-usable highly enriched uranium, and this is the first documented case of theft involving the senior management of a facility handling such material; this is particularly worrisome, as thefts involving senior managers are among the hardest for any security system to prevent.<sup>2</sup>

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<sup>1</sup> Progress in U.S.-Russian cooperation to secure and account for nuclear stockpiles is discussed in more detail later in this paper.

<sup>2</sup> Tyulyakov was arrested in August, and formally charged in September. It is not clear yet whether this material came from Atomflot or some other facility. According to Atomflot's Director, as quoted in *Nezavisimaya Gazeta*,

Elsewhere, deadly dangers are growing. With North Korea's claim that they have processed fuel rods containing enough plutonium for 6-8 nuclear weapons, the probability that terrorists could buy plutonium from that source – or that there could be another source of “loose nukes” if North Korea collapsed – has clearly increased.<sup>3</sup> At the same time, with the invasion of Iraq and the continuing Israeli-Palestinian conflict, hostility toward the United States in the Islamic world has grown to “shocking” levels (as a new report commissioned by the State Department puts it)<sup>4</sup> providing al Qaeda and its brethren with new opportunities to recruit – which could include recruits capable of providing nuclear weapon expertise or access to the materials needed to make a nuclear bomb (a danger highlighted by the case of senior Pakistani nuclear weapon scientist Sultan Bashiruddin Mahmood, an anti-American Islamic extremist who met with bin Laden at length and discussed nuclear weapons).<sup>5</sup>

Five simple facts make the deadly danger clear:

- First, terrorists want to get a nuclear bomb, as both Osama bin Laden's public statements and the documents outlining al Qaeda's nuclear program recovered in Afghanistan make clear.<sup>6</sup>
- Second, if terrorists could get hold of the highly enriched uranium (HEU) or plutonium that are the essential ingredients of a nuclear bomb, making a bomb might well be within the capabilities of a large and sophisticated group such as al Qaeda. Making a “gun-type” bomb – the type that obliterated Hiroshima – from HEU involves little more than slamming two pieces of HEU together fast enough. (The Hiroshima bomb was a cannon barrel that fired a shell of HEU into rings of HEU.) Making a bomb from plutonium would require an “implosion-type” design, in which explosive lenses arranged around a plutonium ball crush it

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Tyulyakov had no authority over nuclear materials. The same article also noted, though without any reference, that Russian investigators are inclined to conclude that Tyulyakov had “dozens” of accomplices, not only at Atomflot, but also in other places in Russia. For more on this case, see, for example, “Zamdirektora Atomflota prodal atomnuyu bombu (Deputy Director of Atomflot Sold Atomic Bomb),” *Kommersant*, October 3, 2003; “Gryaznoe delo (Dirty Business),” *Izvestia*, October 4, 2003; Nadezhda Popova, “'Yaderny Pogreb' Rossii stal prohodnym dvorom (Russia's 'Nuclear Vault' has become public thoroughfare),” *Nezavisimaya Gazeta*, October 20, 2003; and “Russian Official Arrested for Trying to Sell Radioactive Material,” *Agence-France Press*, August 28, 2003. I am grateful to Dmitry Kovchegin for providing English summaries of the *Kommersant* and *Izvestia* accounts.

<sup>3</sup> See, for example, Ashton B. Carter, William J. Perry, and John M. Shalikashvili, “A Scary Thought: Loose Nukes in North Korea,” *Wall Street Journal*, February 6, 2003. Iran's nuclear capabilities have also increased over the past year, but are not yet at the point where Iran could easily produce enough nuclear material for a bomb.

<sup>4</sup> See Advisory Group on Public Diplomacy for the Arab and Muslim World, Edward P. Djerejian, chairman, *Changing Minds, Winning Peace: A New Strategic Direction For U.S. Public Diplomacy in the Arab & Muslim World* (Washington, DC: U.S. Department of State, October 1, 2003, available as of October 20, 2003 at <http://www.state.gov/documents/organization/24882.pdf>).

<sup>5</sup> See, for example, Kamran Khan and Molly Moore, “2 Nuclear Experts Briefed Bin Laden, Pakistanis Say,” *Washington Post*, December 12, 2001; Kamran Khan, “Pakistan Releases Nuclear Scientists for Ramadan's End,” *Washington Post*, December 16, 2001; and Peter Baker, “Pakistani Scientist Who Met Bin Laden Failed Polygraphs, Renewing Suspicions,” *Washington Post*, March 3, 2002.

<sup>6</sup> While the al Qaeda documents found in Afghanistan focus predominantly on more conventional forms of terrorism, and no nuclear materials have been found at al Qaeda sites, the documents nevertheless reveal a significant nuclear weapons effort. For the best available summary, see David Albright, “Al Qaeda's Nuclear Program: Through the Window of Seized Documents,” Special Forum 47 (Berkeley, Cal.: Nautilus Institute, November 6, 2002; available at [http://www.nautilus.org/fora/Special-Policy-Forum/47\\_Albright.html](http://www.nautilus.org/fora/Special-Policy-Forum/47_Albright.html) as of January 27, 2003).

to a smaller size, would be much more difficult for terrorists to accomplish – but still cannot be entirely ruled out.<sup>7</sup> While getting nuclear material and fashioning it into a nuclear bomb would be among the most difficult types of attack for terrorists to accomplish, the appalling devastation that could be wreaked by a nuclear bomb may still make nuclear weapons a priority for terrorists.

- Third, hundreds of tons of nuclear material in dozens of countries around the world today remain dangerously vulnerable to theft. Many of the more than 130 civilian research reactors using HEU fuel (which are scattered in some 40 countries, on every inhabited continent) have no more security than a night watchman and a chain-link fence. Most of the nuclear facilities in the world – including many in the United States – would not be able to provide a reliable defense against attacks as large as terrorists have already proved they are capable of (such as the four coordinated, independent teams of 4-5 suicidal terrorists each that struck on September 11, or the 40 terrorists armed with automatic weapons and explosives that seized a crowded Moscow theater in October 2002 – both of which were planned for months, but carried out with no warning). There are numerous documented cases of real theft of real plutonium or HEU – theft of the essential ingredients of nuclear weapons is not a hypothetical worry, it is an ongoing reality.

Summarizing the nuclear terrorist threat	Yes	No
Do terrorists want nuclear weapons?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Could a terrorist group as sophisticated as al Qaeda plausibly have the ability to make a crude nuclear bomb if it got the necessary nuclear material?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is there nuclear material that might be vulnerable to theft and transfer to terrorists?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is it likely that terrorists, if they had a crude bomb, could smuggle it to New York, Washington, or any other major U.S. city?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Could such a crude bomb turn the heart of any U.S. city into another Hiroshima, killing hundreds of thousands of people?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

- Fourth, if terrorists could steal, buy, or make a nuclear bomb, there can be little confidence that the U.S. government could stop them from smuggling it into the United States. After all, thousands of tons of illegal drugs and millions of illegal immigrants cross U.S. borders every year, despite massive efforts to stop them. The essential ingredients of a nuclear bomb can fit easily into a briefcase – and can be made quite difficult to detect. And unlike the situation with drugs or illegal immigrants, nuclear terrorists only have to succeed once to cause a terrifying catastrophe.<sup>8</sup>
- Fifth, such a crude terrorist bomb would potentially be capable of incinerating the heart of any U.S. city, turning it into a modern Hiroshima. A bomb with the explosive power of 10,000 tons of TNT (smaller than the Hiroshima bomb), if set off in mid-town Manhattan on

<sup>7</sup> John P. Holdren and Matthew Bunn, “Technical Background: A Tutorial on Nuclear Weapons and Nuclear-Explosive Materials,” last updated November 2002, available as of October 20, 2003, at [http://www.nti.org/e\\_research/cnwm/overview/technical.asp](http://www.nti.org/e_research/cnwm/overview/technical.asp).

<sup>8</sup> For more, see Anthony Wier and Matthew Bunn, “Introduction: Interdicting Nuclear Smuggling,” last updated August 2002, available as of October 20, 2003, at [http://www.nti.org/e\\_research/cnwm/interdicting/index.asp](http://www.nti.org/e_research/cnwm/interdicting/index.asp).

a typical workday, could kill half a million people and cause over \$1 trillion in direct economic damage.<sup>9</sup> It is worth remembering just how awesome the power of nuclear weapons is: 10,000 metric tons of TNT is over 20 *million* pounds of high explosive – enough to fill a cargo train a hundred cars long. America and its way of life would never be the same again.

There is good reason for hope, however, that firm action could keep nuclear weapons and the materials needed to make them out of terrorist hands. A nuclear bomb cannot be made without the necessary nuclear materials, and these materials are beyond the plausible capabilities of terrorists to produce. Thus, if the existing stockpiles of nuclear weapons and materials can be effectively secured and prevented from falling into terrorist hands, nuclear weapons terrorism can be effectively prevented: no material, no bomb. Hence, while the war on terrorism and homeland security efforts each has important roles to play in preventing a nuclear terrorist attack on the United States, the most critical and cost-effective step to prevent nuclear terrorism is to secure nuclear weapons and their essential ingredients at their source.<sup>10</sup> (See “Blocking the Terrorist Pathway to the Bomb,” below.)

But in dealing with terrorists who have proven their ability to search out and strike weak points on a global basis, security from nuclear terrorism is only as good as its weakest link – insecure bomb material anywhere is a threat to everyone, everywhere. That means that homeland security begins abroad – wherever insecure nuclear material is to be found. Strengthening or eliminating the weakest links in nuclear security is a big job, but a finite one – and one that technology is available to accomplish. (After all, nations have been guarding crown jewels and other items of immense value for centuries.) The key issues are finding the political will to get the job done, and the creative approaches that will make it possible to overcome the obstacles to improving security for these materials.

The world’s HEU-fueled research reactors are emblematic of the threat – and of what can be done to address it. Born of the nuclear enthusiasm of the “Atoms for Peace” era, hundreds of nuclear research reactors around the world are aging, doing little new research, and limping along on very limited budgets – with too little money to perform their research and maintain safety, let alone paying for stringent security measures (which in many cases would be nearly impossible, given the reactors’ location at facilities such as university campuses). More than 130 of these facilities still use HEU – the easiest material in the world from which to make a nuclear bomb – yet many of these have no more security than a night watchman and a chain-link fence. Most of these facilities do not have enough HEU on-site to make a bomb, but some do, and could pose tempting targets for terrorists.<sup>11</sup>

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<sup>9</sup> See Matthew Bunn, Anthony Wier, and John P. Holdren, *Controlling Nuclear Warheads and Materials: A Report Card and Action Plan* (Washington, DC: Nuclear Threat Initiative and the Project on Managing the Atom, Harvard University, March 2003, available as of October 20, 2003, at [http://www.nti.org/e\\_research/cnwm/overview/report.asp](http://www.nti.org/e_research/cnwm/overview/report.asp)), pp. 15-19.

<sup>10</sup> For a discussion of the steps on the terrorist pathway to the bomb and the actions that can be taken to block them, see Bunn, Wier, and Holdren, *Controlling Nuclear Warheads and Materials*, op. cit., pp. 20-31.

<sup>11</sup> Most HEU research reactor fuel would require some chemical processing (for example to separate the uranium from the aluminum in which it is often dispersed) before it could be used in a bomb. Unfortunately, however, this provides little additional security, as the needed processing is straightforward, all the relevant chemistry has been openly published, and most groups that would plausibly be able to make a nuclear bomb if they had pure HEU



would be able to get pure HEU from the mix of HEU and other materials in these research reactor fuels. Moreover, unlike spent fuel from power reactors (which is massive and so intensely radioactive that potential thieves would likely be incapacitated by radiation effects as they tried to steal it and drive it away), even the “spent” fuel from HEU-fueled research reactors poses a danger – because the fuel elements are typically small and easy to carry away, and have radioactivity levels too low to deter suicidal terrorists (enough to increase their long-term risk of cancer, but not to incapacitate them before they could steal the material and build a bomb).

But two recent events – the airlift of 2-3 bombs’ worth of HEU from a vulnerable facility in Yugoslavia in August 2002 and the removal of roughly a bomb’s worth of HEU from a Romanian research reactor in September 2003 – demonstrate what needs to be done, permanently eliminating the risk that these potential bomb materials would be stolen from these particular facilities. By proving beyond doubt that threats of nuclear theft and terrorism can be effectively addressed through international cooperation, these actions offer hope, and a path forward.

### ***Recent Progress in Programs to Secure Nuclear Stockpiles***

The United States and other states in the international community have a wide range of efforts underway to improve security for nuclear weapons and materials at vulnerable sites in the former Soviet Union and around the world. These efforts have been an excellent investment in U.S. and world security, successfully destroying thousands of bombs’ worth of nuclear material, improving security for scores of vulnerable nuclear sites, and providing at least temporary reemployment for thousands of nuclear weapons scientists and workers who might otherwise have been driven by desperation to seek to sell their knowledge or the materials to which they had access.

The past year has seen additional progress:

- In Fiscal Year (FY) 2003 (which just ended on September 30), U.S. and Russian experts working together succeeded in installing comprehensive security and accounting upgrades for an additional 35 tons of nuclear material in Russia (out of an estimated total of some 600 tons of potentially vulnerable nuclear material outside of assembled nuclear weapons in the former Soviet Union).<sup>12</sup> This brings the total protected by such comprehensive upgrades to date to 23% of the potentially vulnerable stockpile.<sup>13</sup> An additional 18% of this stockpile has had the first round of “rapid” upgrades installed – actions such as hardening doors, bricking over windows, and installing nuclear material detectors at doorways where material might be smuggled out, bringing the total with some type of U.S.-sponsored upgrade completed to 41%.<sup>14</sup> Because the effort concentrated first on upgrading particularly vulnerable sites with small quantities of nuclear material – though still enough for a bomb, if stolen – the fraction of sites completed is still more impressive: 70% of the sites with nuclear weapons or the nuclear materials needed to make them where DOE’s cooperative security upgrade program has been working now have comprehensive upgrades in place.<sup>15</sup> Russia has also undertaken several rounds of upgrading security at its nuclear facilities without U.S. help, in response to

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<sup>12</sup> The 35-ton figure was publicly confirmed by Secretary of Energy Spencer Abraham in “Remarks to the Second Moscow International Nonproliferation Conference,” September 19, 2003, available as of October 20, 2003 at <http://www.ceip.org/files/projects/npp/resources/moscow2003/abrahamremarks.htm>. This figure was supplemented and clarified by personal communications from Department of Energy officials, July and September 2003.

<sup>13</sup> In FY 2002, comprehensive upgrades were completed on only 2% of the potentially vulnerable nuclear material in Russia, according to DOE’s figures. See discussion in Bunn, Wier, and Holdren, *Controlling Nuclear Warheads and Materials*, op. cit., pp. 64-70.

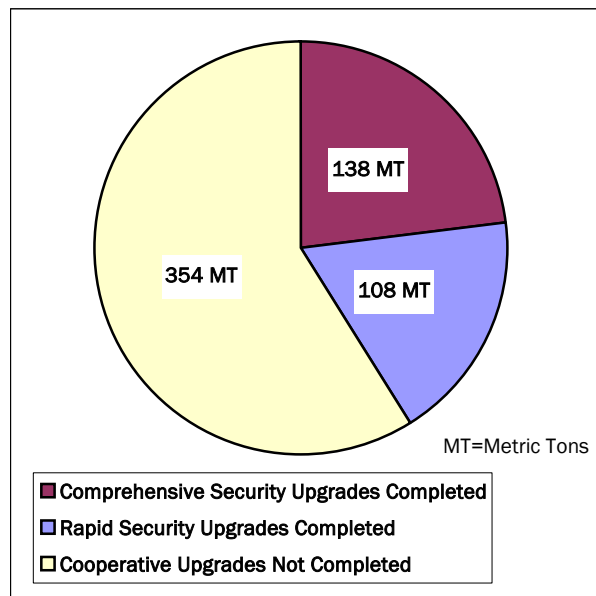
<sup>14</sup> Personal communications from Department of Energy officials, July and September 2003.

<sup>15</sup> Abraham, “Remarks to the Second Moscow International Nonproliferation Conference,” op. cit.



the nuclear material thefts of the 1990s, Chechen terrorist attacks, and the September 11 attacks in the United States.<sup>16</sup>

### Status of Security Upgrades on Russian Weapons-Usable Nuclear Material



- In early 2003, there was a breakthrough in discussions between the U.S. Department of Defense (DOD) and the Russian Ministry of Defense on access for U.S. experts to help with security upgrades at nuclear warhead storage sites. The initial arrangement allows access at nine of well over 100 sites; work is just getting underway at these locations, and actual security upgrades have not yet been installed. The Department of Energy (DOE) continued to make progress in installing upgrades at sites for naval warheads (with sites containing well over half of these warheads equipped with comprehensive security upgrades by the end of 2003), and at a small number of sites for Russian Strategic Rocket Forces warheads.<sup>17</sup>
- In the past year, an additional 30 tons of HEU from dismantled Russian nuclear weapons has been blended down to forms that can never again be used in nuclear weapons, for use as commercial reactor fuel, bringing the total (again as of September 30) to 193 tons of HEU destroyed – enough for over 12,000 nuclear bombs.<sup>18</sup> The United States and Russia are now planning to modestly increase the annual blending rate.<sup>19</sup>

<sup>16</sup> See, for example, Yuri Volodin, Boris Krupchatnikov, and Alexander Sanin, “MPC&A Regulatory Program in the Russian Federation: Trends and Prospective,” in *Proceedings of the 43<sup>rd</sup> Annual Meeting of the Institute for Nuclear Materials Management, Orlando, Florida, June 23–27, 2002* (Northbrook, Illinois: INMM, 2002); and Dmitry Kovchegin, “Approaches to Design Basis Threat in Russia in the Context of Significant Increase of Terrorist Activity,” in *Proceedings of the 44<sup>th</sup> Annual Meeting of the Institute for Nuclear Materials Management, Phoenix, Arizona, July 13–17, 2003* (Northbrook, Illinois: INMM, 2003, available as of October 20, 2003 at [http://bcsia.ksg.harvard.edu/BCSIA\\_content/documents/kovcheginINMM%20Paper.pdf](http://bcsia.ksg.harvard.edu/BCSIA_content/documents/kovcheginINMM%20Paper.pdf)).

<sup>17</sup> Personal communications from officials from Sandia National Laboratories and a DOD contractor, October 2003.

<sup>18</sup> See U.S. Enrichment Corporation, “U.S.-Russian Megatons to Megawatts Program: Turning Warheads Into Electricity (As of September 30, 2003),” available as of October 20, 2003 at [http://www.usec.com/v2001\\_02/](http://www.usec.com/v2001_02/)

- By the end of December, international experts from the International Atomic Energy Agency (IAEA) will have visited an additional nine countries to review their arrangements for securing nuclear materials and facilities and advise on improvements.<sup>20</sup> The IAEA's Nuclear Security Fund now has pledges of over \$20 million – including an additional \$3 million from the United States pledged by Secretary of Energy Spencer Abraham in September – and the agency is carrying out a broad range of activities to help member states improve protections against nuclear terrorism.<sup>21</sup> In September, after a decade and a half of zero real growth while the IAEA's responsibilities increased dramatically, the member states finally agreed to increase the IAEA's budget.<sup>22</sup>
- In September 2003, 14 kilograms (over 30 pounds) of HEU was airlifted from a vulnerable research reactor in Romania to secure storage in Russia, where it will be blended to a form that can no longer be used in nuclear weapons. This was a joint effort of Romania, the United States, Russia, and the IAEA.<sup>23</sup>

These successes demonstrate again that effective action to address the threat is not only possible, but is underway every day. The governments, organizations, and individuals who got the bomb material out of these facilities deserve the world's heartfelt thanks.

But as former Senator Sam Nunn has remarked, the time is past when steps in the right direction can be counted as enough: “a gazelle running from a cheetah is taking a step in the right direction.”<sup>24</sup> The question – for the gazelle and for the world – is whether the steps being taken are fast enough to avoid a fatal catastrophe. Today, there remains an unacceptable danger that the answer is no. After a decade of effort, most of Russia's potentially vulnerable nuclear material and most of its nuclear warheads have not yet had U.S.-funded security upgrades put in place – the world is, in effect, relying for its security on whatever security upgrades for the remaining material and warheads Russia has been able to put in place on its own. The amount of material not yet equipped with cooperative security upgrades is enough for tens of thousands of

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HTML/Megatons\_status.asp. The warhead estimate is based on 15 kilograms of HEU per warhead; USEC's own estimate is based on the IAEA “significant quantity” figure of 25 kilograms of HEU per warhead.

<sup>19</sup> Confirmed by Abraham in “Remarks to the Second Moscow International Nonproliferation Conference,” op. cit.

<sup>20</sup> Personal communication with IAEA official, October 2003. These missions are formally known as the International Physical Protection Advisory Service (IPPAS).

<sup>21</sup> See Spencer Abraham, “Nuclear Nonproliferation: New Challenges and New Solutions,” remarks to the 45<sup>th</sup> IAEA General Conference, September 15, 2003 (available as of October 20, 2003 at [http://www.energy.gov/engine/content.do?PUBLIC\\_ID=14140&BT\\_CODE=PR\\_SPEECHES&TT\\_CODE=PRESSRELEASE](http://www.energy.gov/engine/content.do?PUBLIC_ID=14140&BT_CODE=PR_SPEECHES&TT_CODE=PRESSRELEASE)); and International Atomic Energy Agency, “Nuclear Security – Measures to Protect Against Nuclear Terrorism,” GC(47)/17 (Vienna, Austria: IAEA, August 20, 2003, available as of October 20, 2003 at <http://www.iaea.org/worldatom/About/Policy/GC/GC47/Documents/gc47-17.pdf>).

<sup>22</sup> See International Atomic Energy Agency, “States Okay Landmark IAEA Budget for 2004-2005” (Vienna, Austria: IAEA, September 18, 2003, available as of October 20, 2003 at <http://www.iaea.org/worldatom/About/Policy/GC/GC47/DailyWrap/budget.html>).

<sup>23</sup> See, for example, U.S. Department of Energy, “The United States, Russian Federation, Romania, and the International Atomic Energy Agency Cooperation on Nonproliferation” (Washington, DC: September 22, 2003, available as of October 20, 2003 at <http://usinfo.state.gov/topical/pol/arms/03092215.htm>).

<sup>24</sup> Sam Nunn, remarks to the Carnegie Endowment for International Peace 2002 Nonproliferation Conference, Washington, D.C., November 14, 2002 (available at [http://www.nti.org/c\\_press/speech\\_samnunn\\_1114.pdf](http://www.nti.org/c_press/speech_samnunn_1114.pdf) as of January 3, 2003).

nuclear weapons – if even one tenth of one percent of it should go missing, the world could be faced with a catastrophe beyond measure.

While the 35 tons of material equipped with comprehensive security upgrades this year represents three times the pace at which such upgrades were installed the previous year, at a 35-ton-per-year pace it would still take some 13 years to finish the job. Clearly, a dramatic further acceleration would be needed to meet DOE's goal of providing comprehensive security upgrades for all of the material by the end of 2008 – a target only 5 years away.<sup>25</sup> The same is even more true of the warhead security upgrades sponsored by DOD, which have yet to complete planned comprehensive upgrades at a single site (though DOE has completed upgrades at a substantial fraction of the warhead sites where it is working, having managed to work out an access arrangement earlier than DOD did). Much less progress has been made in upgrading security or removing the potential bomb material in many other countries around the world where weapons-usable nuclear material exists. The removal of the HEU from Romania comes a year after an even larger removal from Yugoslavia; if that one-site-per-year rate were to remain unchanged, it would take a quarter century to finish removing the HEU from the 24 sites identified by the State Department as most urgently requiring such removals.<sup>26</sup>

### *Steps Backward and Continuing Obstacles*

In addition to progress, there were a number of unfortunate steps backward in the last year as well:

- The administration has allowed much of the modest amount of high-level attention that has been focused on this agenda in the past year to be sucked into an obscure dispute over liability provisions in threat reduction agreements.<sup>27</sup> In July and September 2003 these liability disputes led to the expiration of two major U.S.-Russian threat reduction agreements – an agreement on technical cooperation toward disposition of excess weapons plutonium, and the Nuclear Cities Initiative (NCI) agreement, focused on reducing Russia's oversized and under funded nuclear weapons complex and redirecting personnel and facilities that are no longer needed for weapons work. While work in both programs is continuing under contracts signed before the accords expired, both are threatened by the ongoing disagreement over liability. This was the first time that major threat reduction agreements had been allowed to expire.

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<sup>25</sup> While major new steps to accelerate the effort would be needed to meet the 2008 goal, some significant acceleration is likely on the current track – because the program, having completed upgrades at most of the small, particularly vulnerable nuclear facilities (where upgrades had a substantial impact on reducing proliferation risk, but little impact on a measure based on how much material was secured) is now focusing increasingly on buildings holding huge quantities of nuclear material, so that each building upgraded will add more to the total quantity of material secured. In addition, over the past year discussions of an arrangement that would allow cooperative upgrades to move forward at particularly sensitive sites have made considerable progress; if that agreement is reached, and is successful, this could accelerate progress significantly. Personal communications with DOE and laboratory officials, July and September 2003.

<sup>26</sup> See, for example, Matthew Bunn, "Removing Nuclear Materials from Vulnerable Sites," available as of October 20, 2003, at [http://www.nti.org/e\\_research/cnwm/securing/vulnerable.asp](http://www.nti.org/e_research/cnwm/securing/vulnerable.asp).

<sup>27</sup> See, for example, Kenneth N. Luongo, director of the Russian-American Nuclear Security Advisory Council (RANSAC), letter to Colin Powell, Spencer Abraham, and Condoleezza Rice, July 2, 2003, available as of July 11, 2003 at [http://www.ransac.org/new-web-site/whatsnew/070203\\_puncirenewal.pdf](http://www.ransac.org/new-web-site/whatsnew/070203_puncirenewal.pdf).

- The administration has terminated efforts to improve security at operational tactical nuclear warhead sites in Russia – some of the sites that may pose the greatest risk of theft of an actual nuclear weapon – to avoid possibly contributing in some small way to Russia’s operational nuclear capabilities.<sup>28</sup> In other words, Russian operational nuclear capabilities pose so little threat to the United States that we can have a strategic arms reduction agreement with no verification provisions at all, but so much of a threat to the United States that we should leave Russia’s nuclear weapons more vulnerable to falling into the hands of terrorists to avoid increasing those Russian capabilities. This policy can most charitably be described as incoherent.
- While the year has seen some significant new allies for these efforts emerge in the U.S. Congress, some in Congress continue to seek to tie these efforts in knots with needless and impractical certification and reporting requirements, while offering little that would actually accelerate the reduction of the real threat posed to the country. The House version of the FY 2004 defense authorization bill, for example, would prohibit spending more than 35% of the cost of a threat reduction project until the project had acquired all the permits it would ever need – even though, under Russian law, in many cases operational permits cannot be granted until construction is completed.
- In the compromise now shaping up in the energy bill before Congress, it appears that legal constraints on the export of HEU for production of medical isotopes – in amounts large enough for several bombs per year – will be substantially loosened, greatly weakening the producers’ incentives to shift to low-enriched uranium that cannot be used as the core of a nuclear bomb.<sup>29</sup>
- Expert discussions of a draft amendment to strengthen the Convention on Physical Protection of Nuclear Materials effectively ground to a halt in March 2003 without reaching final agreement on several key points, throwing prospects for any strengthening of international standards for securing nuclear materials into doubt.<sup>30</sup>

Substantial obstacles to an accelerated effort to secure the world’s nuclear stockpiles still remain – continuing U.S.-Russian distrust, difficulties in building partnerships in this sensitive area with other countries around the world, disputes over access to sensitive sites, slow contracting procedures, post-September 11 visa processing problems, and a wide variety of other bureaucratic underbrush requiring sustained high-level attention to sweep away. Unfortunately, the principal focus of U.S. efforts to prevent nuclear weapons terrorism continues to be on

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<sup>28</sup> This decision is officially confirmed in U.S. Congress, General Accounting Office, *Weapons of Mass Destruction: Additional Russian Cooperation Needed to Facilitate U.S. Efforts to Improve Security at Russian Sites*, GAO-03-482 (Washington, DC: GAO, March 2003, available as of October 20, 2003 at <http://www.gao.gov/new.items/d03482.pdf>), pp. 4-5.

<sup>29</sup> For a discussion of this issue, see, for example, Matthew Bunn et al., letter to energy bill conferees, September 25, 2003, available as of October 20, 2003 at <http://www.nci.org/03NCI/09/House-Senate-conferees.htm>.

<sup>30</sup> Patricia A. Comella, “Revising the Convention on the Physical Protection of Nuclear Material -- Chapter IV,” and Denis Flory, “Revising the CPPNM: Challenges and Constraints,” both in *Proceedings of the 44th Annual Meeting of the Institute for Nuclear Materials Management, Phoenix, Arizona, July 13-17, 2003* (Northbrook, IL: INMM, 2003),

confronting hostile states that might have a connection to terrorists, and on the extremely difficult challenge of detecting materials or weapons as they are being smuggled into the United States – rather than on more cost-effective approaches focused on securing at their sources the vast existing stockpiles of weapons and materials into which terrorists might tap. And other governments, in general, are placing still lower priority on efforts to improve security and accounting for nuclear stockpiles around the world. Governments around the world, in short, are not yet taking the rapid actions that are needed – it is up to concerned citizens in each country to demand that action.

### *The Budget Picture*

For most parts of the effort to keep nuclear weapons, materials, and expertise out of terrorist hands, budget limitations are not the principal obstacles to progress.<sup>31</sup> Indeed, in the programs focused specifically on improving security for nuclear warheads and materials outside the United States, disputes over access, slow contracting procedures, and other bureaucratic obstacles have slowed progress to such an extent that hundreds of millions of dollars of unspent money has built up. Increased funding would, however, be needed to implement a greatly accelerated effort, if these other obstacles could be overcome.

Funding levels, and changes in them, are nevertheless an interesting measure of the overall level of priority assigned to a particular mission. The administration's FY 2004 funding request for programs focused on improving controls over nuclear warheads, materials, and expertise outside the United States comes to just over \$650 million.<sup>32</sup> Congress has not yet completed its work on the FY 2004 appropriations bills that will fund these activities, but from the versions of the bills passed by the House and the Senate, it appears that the administration's request will be approved with only minor changes. Without adjusting for inflation, this annual budget is about 8% higher than the comparable budget in the last year of the Clinton administration – that is, before September 11 ever occurred. That rate of growth is smaller even than the growth in non-defense, non-homeland security discretionary spending that the administration has been fighting to restrain – up 13% in the FY 2004 request, compared to FY 2001.<sup>33</sup> (Indeed, adjusted for inflation, this year's budget for controlling nuclear warheads and materials is only 2.7% higher than the budget before the administration came to office.) Congress, much more than the administration, has led the way in increasing budgets for these efforts, adding funding for critical needs in supplemental appropriations that came after

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<sup>31</sup> There are a few areas where the lack of sufficient funding commitments – either from the U.S. government or from other parties – is among the main constraints on progress, including efforts to sustainably reemploy former nuclear weapons scientists, subsidized disposition of Russian excess weapons plutonium, and subsidized purchases or blending of Russian excess HEU.

<sup>32</sup> See Anthony Wier, "Interactive Threat Reduction Budget Database," last updated September 2003, available as of October 20, 2003 at <http://www.nti.org/cnwm>, and Anthony Wier and Matthew Bunn, "Funding Summary," last updated September 2003, available as of October 20, 2003 at [http://www.nti.org/e\\_research/cnwm/overview/funding.asp](http://www.nti.org/e_research/cnwm/overview/funding.asp). Total threat reduction funding is in the range of \$1 billion, spread across the Departments of Defense, Energy, and State, but many of these funds go to worthwhile endeavors not directly focused on controlling nuclear weapons, materials, and expertise, from dismantling missiles to destroying chemical weapons to promoting military-to-military contacts. For discussion, see Bunn, Wier, and Holdren, *Controlling Nuclear Warheads and Materials*, op. cit., pp. 46-59.

<sup>33</sup> Calculations derived from figures in U.S. Office of Management and Budget, "Charts on the Updated Fiscal Situation," July 2003, available as of October 20, 2003 at <http://www.whitehouse.gov/omb/charts/msr-charts.html>.

September 11, in both FY 2002 and FY 2003, increasing overall funding for these efforts by more than 20% over the administration's requests over the FY 2002–FY 2004 period. Had the administration's funding requests for that period simply been approved without change, total spending for this mission would have been over \$100 million *less* than simply continuing the spending of the last year of the Clinton administration.<sup>34</sup>

Although President Bush has repeatedly said that his administration's highest priority is to keep weapons of mass destruction out of terrorist hands, the \$650 million allocated to keeping nuclear weapons – the most devastating weapons of all – out of terrorist hands represents two-tenths of one percent of the defense budget the President requested and Congress approved for FY 2004. This funding, intended to help secure all the stockpiles of nuclear weapons and materials around the world, is only slightly more than the \$600 million supplemental appropriation both houses of Congress have approved to continue the so far largely fruitless search for weapons of mass destruction in Iraq.

Senior DOE officials have made the point, correctly, that spending on nonproliferation in DOE is up 70% in the administration's FY 2004 request compared to the levels that existed when the Bush team came to office. This represents an important financial commitment to these nonproliferation programs. But it is important to note that of the \$551.7 million increase in DOE's "Defense Nuclear Nonproliferation" account since FY 2001, \$431.1 million, or 78% of the total increase, is for disposition of the United States' own excess weapons plutonium (reflecting the shift from preparations to construction of facilities).<sup>35</sup> While this is an important effort, it does not directly reduce the nuclear terrorist threat posed by insecure material elsewhere in the world, and the administration itself does not count it in estimating its total contribution to the threat reduction efforts of the G-8 Global Partnership.

### ***The Need for Sustained High-Level Leadership***

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<sup>34</sup> Total spending on the programs focused on controlling nuclear warheads, materials, and expertise was \$602.5 million in FY 2001, the last year of the Clinton administration. When it first came to office, the administration called for substantial cutbacks in these efforts, requesting \$435.4 million in FY 2002. The final approved level for FY 2002 was \$683.3 million, counting funding from supplemental appropriations passed in response to September 11 (in which the administration proposed no increased funding whatever for these programs). In FY 2003, the administration's request was \$597.4 million – still slightly below the final Clinton level, despite the events of September 11. The final appropriation by Congress, counting supplemental appropriations, was \$713.7 million. For FY 2004, the administration has requested \$653.5 million, and while Congressional action is not completed, it appears that the final budget will be quite close to the requested figure. The calculation in the text assumes that Congress simply approves the request for these programs in FY 2004 without adding or subtracting funding or accounting for inflation. If the budgets are adjusted to account for price changes using OMB's government-wide price deflator, then the real gap between the last Clinton budget and the cumulative budget requests by the administration becomes even larger, nearing \$200 million spread out over the three years, or about 11 percent of the total. For all the final appropriations figures, and the administration's FY 2002, 2003, and 2004 request figures, see Wier, "Interactive Threat Reduction Budget Database," op. cit. To be fair, nearly all of this reduction from continuing a flat Clinton-era budget came in the Bush administration's FY 2002 budget request, made soon after coming to office, before the administration had time to review these programs in detail. If the most recent FY 2004 request is considered as most representative of the administration's current approach, had this request been made and approved in each of the three years of the Bush administration, total spending would have been 8% more than simply continuing the Clinton-era budget, without adjusting for inflation.

<sup>35</sup> Calculation based on DOE budget documentation for FY 2002, FY 2003, and FY 2004. The author is grateful to Anthony Wier for providing these figures and additional budget analysis for this section.

President Bush has been quite eloquent and frightening in outlining the deadly danger that terrorists might get and use weapons of mass destruction, and has said “we will do everything in our power” to keep that from happening.<sup>36</sup> In his address to the United Nations General Assembly in September 2003 President Bush pointed out that securing nuclear material at the source was a “crucial step,” and called for a new UN Security Council resolution that would, among other things, call on all UN members “to secure any and all sensitive materials within their own borders.”<sup>37</sup> But President Bush, like President Clinton before him, has only intermittently seized the opportunities for Presidential action to accelerate the effort to secure the world’s nuclear stockpiles.

In the past year, for example:

- The Evian G-8 summit representing the one-year anniversary of the “Global Partnership Against the Spread of Weapons and Materials of Mass Destruction” – originally announced as a crucial element of the effort to keep weapons of mass destruction out of terrorist hands – came and went with very little action on securing the world’s nuclear stockpiles. By the summit, participants in the Global Partnership have pledged some \$18 billion toward the \$20 billion target decided on at the Kananaskis G-8 summit the year before, and the partnership is making progress on programs to dismantle aging submarines and destroy chemical weapons stockpiles – but there is no sign as yet of funding or priority from any of the non-U.S. participants for efforts to secure nuclear stockpiles around the world.<sup>38</sup>
- The President’s most visible new initiative on nonproliferation has been the Proliferation Security Initiative, focused on blocking shipments that might contain weapons of mass destruction or missiles on the high seas or in the air, where legal authorities exist to do so. This initiative, while valuable for shipments that are large and identifiable (such as missiles or chemical weapons factories), is likely to have modest benefit in preventing nuclear smuggling, when the nuclear materials for a bomb can easily fit in a briefcase.<sup>39</sup>
- At their September 2003 summit, President Bush and Russian President Vladimir Putin laid out a specific agenda of next steps for U.S.-Russian cooperation – which did not include any

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<sup>36</sup> President George W. Bush, “State of the Union Address” (Washington, D.C.: The White House, Office of the Press Secretary, press release, January 28, 2003; available at <http://www.whitehouse.gov/news/releases/2003/01/20030128-19.html> as of January 30, 2003).

<sup>37</sup> President George W. Bush, “President Bush Addresses U.N. General Assembly” (New York, New York: The White House, Office of the Press Secretary, transcript, September 23, 2003; available at <http://www.whitehouse.gov/news/releases/2003/09/20030923-4.html> as of October 21, 2003).

<sup>38</sup> For a useful assessment, see “Global Partnership Update: A Post-Evian Assessment” (Washington, DC: Strengthening Global Partnership Project, Center for Strategic and International Studies, July 2003, available as of October 20, 2003 at <http://www.sgpproject.org/GP%20Update%20no1.pdf>).

<sup>39</sup> See, for example, Anthony Wier, “International Efforts to Combat Smuggling in Nuclear Weapons and Materials,” last updated September 2003, available as of October 20, 2003 at [http://www.nti.org/e\\_research/cnwm/interdicting/worldsmuggling.asp](http://www.nti.org/e_research/cnwm/interdicting/worldsmuggling.asp).

action on security for nuclear materials.<sup>40</sup> Similarly, the two took no new action on this subject at their May 2003 summit.

Below the Presidential level, Secretary of Energy Abraham and the senior officials of his department have worked very hard to move this agenda forward. Abraham and Russian Minister of Atomic Energy Alexander Rumiantsev agreed shortly after September 11 to accelerate cooperation in securing nuclear warheads and materials, and have established a group of senior officials from both sides that meets regularly to attempt to work through specifics of achieving that objective. Abraham and Rumiantsev have met repeatedly, and report that they speak by telephone every two weeks between meetings.<sup>41</sup> Slowly but surely, they have made progress in breaking down some of the barriers to accelerated cooperation.

But the reality is that many of the key obstacles slowing progress today (including access to sensitive sites, approaches to liability in the event of an accident, cumbersome visa procedures, and more) cut across departments, and can only be effectively addressed by the U.S. and Russian Presidents or senior officials reporting to them, with authorities that stretch across agency boundaries. (Russia has now created an interagency group that meets regularly under the Prime Minister to address issues related to the Global Partnership, which in a sense puts it ahead of the United States in resolving these interagency issues.) The lesson of past arms control negotiations is very clear: where the President is personally involved day-to-day in pushing these efforts forward, making the hard decisions, and sweeping aside the inevitable obstacles, these efforts succeed. When that is not the case, they fail.

Many reports over the years have recommended the appointment of a senior official, reporting directly to the President, who would be personally accountable for leading the myriad efforts by different agencies and departments required to ensure that all the world's stockpiles of nuclear weapons and nuclear materials are secured as quickly as possible, and ensuring that obstacles are identified and overcome as they arise. The administration, like the Clinton administration before it, has rejected these proposals, arguing, in effect, that "czars never work." And yet, faced with a critical situation in the reconstruction of Iraq, President Bush took just this advice – he charged the National Security Adviser, reporting to him, with leading efforts in different parts of the government to build a stable and free Iraq. Such steps can only be taken for a small number of issues that are critical to the national security – but preventing terrorists from getting a nuclear bomb is surely one such problem.

Securing the world's nuclear stockpiles will require building a true global coalition against nuclear terrorism, involving sensitive cooperation from countries all around the world. But President Bush and Russian President Putin are the key players in this drama, for they lead the countries with by far the world's largest stockpiles of nuclear weapons and materials – and the experience, technologies, and influence to help other countries around the world improve security for their stockpiles (and to demand that they do so). Both Presidents have made strong

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<sup>40</sup> See "Joint Statement Between the United States of America and the Russian Federation" (Washington, DC: The White House, September 27, 2003, available as of October 20, 2003 at <http://www.whitehouse.gov/news/releases/2003/09/20030927-11.html>).

<sup>41</sup> Remarks by both Abraham and Rumiantsev, "Second Moscow International Nonproliferation Conference," September 19, 2003, and personal communications with DOE officials, March, July, and September 2003.



public statements highlighting the danger that terrorists might get and use weapons of mass destruction. If these two Presidents fully understood the gap that now exists between the urgency of the threat and the pace of the response – and the historic opportunity they have to close that gap – there is every reason to believe that they would take strong action. If they understood that gap, they would not have allowed disputes over access to sensitive sites, liability provisions, slow contracting procedures, and other bureaucratic obstacles to delay progress in securing nuclear warheads and materials for years at a time,<sup>42</sup> or (in Putin’s case) provided so little money to the force that guard’s Russia’s nuclear warheads that it could only install a handful of the U.S.-provided security upgrade kits each year, leaving equipment that experts from both sides had agreed was urgently needed moldering in warehouses for years at a time.<sup>43</sup> The point is simple: there is in fact more, much more, that it is in President Bush and President Putin’s power to do to reduce this threat. By taking action *now*, these two Presidents could reduce the threat to a fraction of what it is today within a few years.

### *Next Steps*

President Bush needs to say firmly to his administration: “I want to get all of the nuclear weapons and materials in the world effectively secured, and the materials removed entirely from the most vulnerable sites, just as quickly as that can possibly be done. I want a plan drawn up, and a management approach put in place where I can hold someone accountable for getting it done. I will tolerate no delays.” Such an instruction, if taken seriously and followed through, could radically transform the effort to keep these deadly stockpiles out of terrorist hands. Success will require sustained, top-priority attention from the White House – not just occasional encouraging statements, but in-depth, day-to-day engagement. If even a twentieth of the effort and resources devoted to Iraq in the last year were devoted to ensuring that all stockpiles of nuclear weapons and weapons-usable nuclear materials around the world were secure and accounted for, there is good reason to believe that the job could be accomplished quickly.

An accelerated and strengthened effort would have many ingredients,<sup>44</sup> but there are three elements that are essential: removing the material entirely from the world’s most vulnerable sites; accelerating and strengthening the effort in Russia, where the largest stockpile of potentially vulnerable nuclear materials still exist; and building a fast-paced global coalition to improve security for nuclear materials around the world.

1. ***Remove the material entirely from the world’s most vulnerable sites.*** The surest way to ensure that nuclear material will not be stolen from a particular site is to remove it, so there is nothing left to steal. There are a variety of U.S. programs focusing on pieces of the problem of removing material from the world’s most vulnerable sites, and these have had some important successes. What is needed now is a single, mission-focused effort with all the authority, resources, expertise, and flexibility needed to get these materials removed as rapidly as possible – including flexible authority to provide incentives tailored to the needs of

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<sup>42</sup> For a discussion of some of these impediments, see Bunn, Wier, and Holdren, *Controlling Nuclear Warheads and Materials*, op. cit., pp. 36-37.

<sup>43</sup> See discussion in Bunn, Wier, and Holdren, *Controlling Nuclear Warheads and Materials*, op. cit., p. 38.

<sup>44</sup> See discussion in Bunn, Wier, and Holdren, *Controlling Nuclear Warheads and Materials*, op. cit., pp. 118-122

each site to convince them to give up their nuclear material.<sup>45</sup> Funded at perhaps \$50 million per year, such an effort could eliminate many of the most serious nuclear terrorism dangers around the world in a few years. Provisions calling for the establishment of such an effort are now being debated in House-Senate negotiations over the energy and water appropriation bill, the defense authorization bill, and the foreign relations authorization bill.<sup>46</sup> Congress and the President need to act immediately to put such a program in place.

2. ***Accelerate and strengthen cooperation with Russia to secure nuclear stockpiles.*** Between them, President Bush and President Putin have the power to overcome the disputes over access to sensitive facilities and the myriad bureaucratic obstacles that have been allowed to slow progress in these efforts.<sup>47</sup> President Bush should use his relationship with President Putin to convince the Russian President of the urgency of action – for Russia’s own security as well as that of the United States. The two Presidents should (a) identify securing all stockpiles of nuclear warheads and materials as a top priority for both countries’ national security; (b) jointly set a target date of 2 years for completing “rapid upgrades” or “quick fixes” for all nuclear weapons and weapons-usable nuclear materials, and 4 years for completing comprehensive upgrades (while putting in place a mechanism for quickly identifying and overcoming obstacles as they arise); (c) agree on an approach to access to sensitive sites (including a U.S. offer of reciprocal access to comparable sites in the United States, and an arrangement for accomplishing security upgrades at sites too sensitive for either side to be willing to allow access to the other); (d) instruct their governments to ensure that the security upgrades accomplished are designed to provide security in the face of post-September 11 terrorist threats; and (e) put in place the commitments and approaches needed to ensure that once effective security systems are installed, high levels of security will be maintained for the long haul – including after U.S. assistance phases out. President Bush should make this a central element of U.S.-Russian relations, and it should be a high priority in preparations for the next Bush-Putin summit.
  
3. ***Build a fast-paced global coalition to upgrade security for nuclear stockpiles in countries around the world.*** With nuclear material located in dozens of countries around the world, there is an urgent need to put the “global” back in the Global Partnership (which has so far focused almost exclusively on projects in Russia) – to forge a coalition of countries around the world willing to work together to improve security for nuclear materials, wherever they may be. As Senator Richard Lugar (R-IN) has argued, before we can declare victory in the war to prevent catastrophic terrorism, “every nation that has weapons and materials of mass destruction must account for what it has, safely secure what it has (spending its own money or obtaining international technical and financial resources to do so) and pledge that no other nation, cell or cause will be allowed access or use.”<sup>48</sup> As long as caches of unsecured nuclear

<sup>45</sup> For a more detailed version of this recommendation, see Bunn, Wier, and Holdren, *Controlling Nuclear Warheads and Materials*, op. cit., pp. 115-118.

<sup>46</sup> See Anthony Wier, “Legislative Update,” last updated October 2003, available as of October 20, 2003 at [http://www.nti.org/e\\_research/cnwm/overview/legislative.asp](http://www.nti.org/e_research/cnwm/overview/legislative.asp).

<sup>47</sup> For a discussion of the problems posed by access, in particular, see U.S. Congress, General Accounting Office, *Weapons of Mass Destruction: Additional Russian Cooperation Needed to Facilitate U.S. Efforts to Improve Security at Russian Sites*, GAO-03-482 (Washington, DC: GAO, March 2003, available as of July 11, 2003 at <http://www.gao.gov/new.items/d03482.pdf>).

<sup>48</sup> Richard Lugar, “Eye on a Worldwide Weapon Cache,” *The Washington Post*, December 6, 2001.

weapons material remain, the struggle will not be over. Building such a global effort will not and cannot be a matter of making carbon copies of the approach the United States and Russia have taken in their Nunn-Lugar cooperation – approaches will have to be adapted to each national circumstance. Given the enormous sensitivities surrounding the nuclear activities of states such as Pakistan, India, Israel, and China, this will be a serious challenge, requiring higher priority and greater creativity than U.S. efforts to forge partnerships with these states to improve nuclear security have seen to date.

Together, these three elements – removing material from vulnerable sites, accelerating and strengthening security upgrades for the world's largest cache, and expanding the effort worldwide – form the central core of a plan that could drastically reduce the danger of nuclear terrorism within the next few years.

The terrorists have made clear that they want nuclear weapons, and are working to get them. A continuing stream of attacks and intelligence analyses makes clear that al Qaeda is regrouping, recruiting and training new operatives, and still seeking to carry out catastrophic attacks on the United States and other countries. President Bush has eloquently warned that “history will judge harshly those who saw this coming danger but failed to act.”<sup>49</sup> The question remains: on the day after a terrorist nuclear attack, what will we wish we had done to prevent it? And why aren't we doing that now?

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<sup>49</sup> George W. Bush, foreword to the *National Security Strategy of the United States of America* (Washington, DC: September, 2002).