

Preventing Nuclear Terrorism: An Agenda for the Next President

MATTHEW BUNN

ASSOCIATE PROFESSOR OF PUBLIC POLICY, JOHN F. KENNEDY SCHOOL OF
GOVERNMENT, HARVARD UNIVERSITY

Abstract

The danger that terrorists could get and use a nuclear bomb, turning the heart of a modern city into a smoldering ruin and sending aftershocks throughout the world, remains unacceptably high. Existing programs have made major progress in improving security for nuclear stockpiles in the former Soviet Union and elsewhere, and in removing highly enriched uranium (HEU) from some vulnerable sites; the risk is certainly lower today than it would have been had these programs not been undertaken. But much more remains to be done. The obstacles to accelerated and expanded progress, arising from complacency, secrecy, concerns over sovereignty, political disputes, and bureaucratic impediments, are deep and real. Sustained high-level leadership will be needed to overcome them. But the next U.S. president will have an historic opportunity -- to take actions that can reduce the risk of nuclear terrorism to a fraction of its current level in his first term. This paper outlines an agenda for action to achieve that objective, focused first and foremost on preventing nuclear theft, but also including measures to stop nuclear smuggling, prevent states from providing nuclear weapons and materials to terrorists, and disrupt the other elements of terrorist nuclear plots.

Do not cite, quote, or circulate without permission

Preventing Nuclear Terrorism: An Agenda for the Next President

MATTHEW BUNN

ASSOCIATE PROFESSOR OF PUBLIC POLICY, JOHN F. KENNEDY SCHOOL OF GOVERNMENT, HARVARD UNIVERSITY

The US president who takes office in January 2009 will face an immense set of challenges.¹ The global financial and economic crisis will squeeze the amount of high-level attention that can be focused on security issues. And Iraq, Afghanistan, Pakistan, Iran, North Korea, the Middle East, and the struggle against terrorism – among other issues – will be demanding urgent attention.

But the new president will also face a world in which the danger that terrorists could get and use a nuclear bomb remains very real. Despite the other challenges on the agenda, there can be few higher priorities than ensuring that terrorists cannot turn the heart of a major city into a smoldering ruin. The horror of a terrorist nuclear attack, should it ever occur, would reach far beyond the city attacked, transforming America and the world – and not for the better. While the probability that terrorists could get and use a nuclear bomb can never be reduced to zero, the goal must be to get as close to zero as possible, as quickly as possible.

Terrorists are still seeking nuclear weapons – and al-Qaeda is reconstituting its ability to plan and conduct complex operations in the mountains of Pakistan. If a technically sophisticated terrorist group could get the needed nuclear materials, it might well be able to make at least a crude nuclear bomb.

¹ This paper is largely drawn from Matthew Bunn, *Securing the Bomb 2008* (Cambridge, Mass: Project on Managing the Atom, Harvard University, and Nuclear Threat Initiative, forthcoming November 2008). The full report will be available, along with hundreds of pages of other information and an on-line threat reduction budget database, at <http://www.nti.org/securingthebomb>. References and more detailed analyses and recommendations are available in the full report.

Despite substantial progress in improving nuclear security, some stockpiles of potential bomb material remain dangerously insecure. In Russia, there have been major improvements in nuclear security – the difference between the security in place at many nuclear sites today and the security in place in 1994 is like night and day. But Russia has the world’s largest stockpiles of nuclear weapons and materials, located in the world’s largest number of buildings and bunkers; some serious security weaknesses still remain, ranging from poorly trained, sometimes suicidal guards to serious underfunding of nuclear security; and the upgraded security systems must face huge threats, from insider theft conspiracies to terrorist groups who have shown an ability to strike in force, without warning or mercy. In Pakistan, a relatively small nuclear stockpile, believed to be heavily guarded, faces even more severe threats, both from nuclear insiders with violent Islamic extremist sympathies and from outsider attack, potentially by scores or hundreds of al-Qaeda fighters. Some 130 nuclear research reactors around the world still use highly enriched uranium (HEU) as their fuel, and many of these have only the most modest security measures in place – in some cases, no more than a night watchman and a chain-link fence.

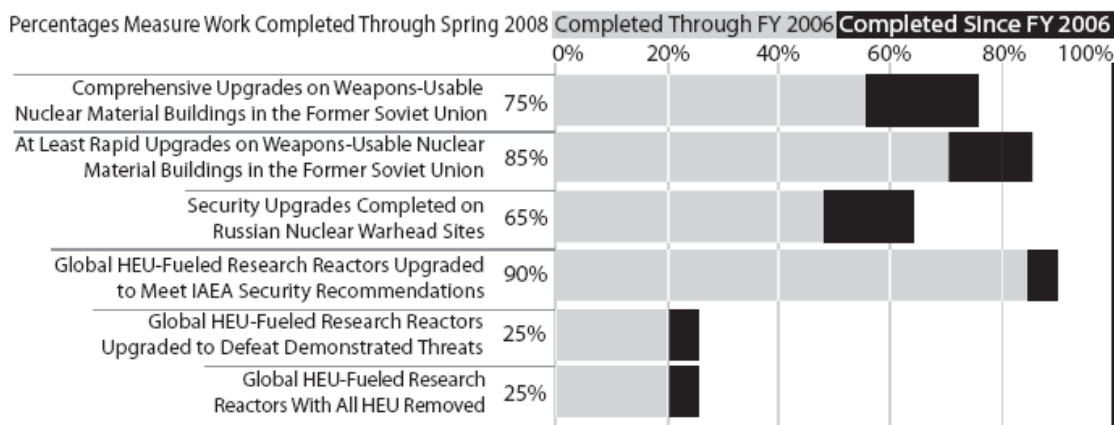
The break-in by armed attackers at the Pelindaba site in South Africa in November 2007 – a site with hundreds of kilograms of weapon-grade uranium – is a reminder that nuclear security is a global problem, not just a problem in the former Soviet Union. And incidents such as the inadvertent flight of six nuclear warheads to Barksdale Air Force Base make it clear that nuclear security requires constant vigilance, and that every country where these stockpiles exist, including the United States, has more to do to ensure that they are effectively secured.

Programs sponsored by the United States and other countries are making major progress in addressing these dangers, representing an excellent investment in US and world security. Thousands of bombs’ worth of HEU has been destroyed forever. (Remarkably, roughly 10% of the electricity in the United States is fueled by uranium from dismantled Russian nuclear bombs.) Scores of buildings (and more than a dozen countries) have been cleared of all of their potential nuclear bomb material, and scores more have seen security measures drastically improved. There is no doubt that the risk of nuclear terrorism today is substantially less than it would have been had these programs never existed.

But much more must still be done to reduce the risk. While cooperative security upgrades in Russia are nearing completion, in much of the rest of the world the effort is just beginning. No effective global standards exist that specify how secure nuclear weapons or the materials needed to make them should be – and the practices in place on the ground vary widely. (In some countries, it remains against the rules to have *any* armed guards at nuclear facilities – even ones with substantial quantities of plutonium or HEU.) Scores of HEU-fueled research reactors are not yet targeted for conversion or shut-down, tons of civilian HEU is not yet slated for removal to secure storage facilities, and few of these facilities have had security upgrades that would protect against an attack like the one at Pelindaba.

While quantitative indicators never tell more than part of the story, Figure 1 highlights the enormous amount that has already been accomplished in securing nuclear stockpiles, and the enormous distance yet to go. By the end of fiscal year (FY) 2008 (that is, September 30, 2008), comprehensive security upgrades had been completed for roughly 75% of the buildings in the former Soviet Union that contain weapons-usable nuclear material, and US and Russian experts were rushing to complete agreed upgrades by the end of 2008. At the same time, however, while the Global Threat Reduction Initiative (GTRI) has greatly accelerated security upgrades, conversion to low-enriched uranium, and HEU removals at HEU-fueled research reactors, some three-quarters of these facilities had not yet had their HEU removed or had their security upgraded to a level that would provide effective protection against demonstrated terrorist and criminal threats.

Figure 1: Progress of US-Funded Work to Secure Nuclear Stockpiles



This paper focuses primarily on efforts to secure and remove nuclear weapons and the materials needed to make them, in order to keep them from being stolen, for these steps offer the most effective means to reduce the risk that terrorists will get and use a nuclear bomb. The complexities of producing nuclear bomb materials from scratch are beyond the plausible capabilities of terrorist groups. Hence, if all the stockpiles produced by states can be reliably kept out of terrorist hands, nuclear terrorism can be reliably prevented. But once nuclear material has been stolen, it could be anywhere, and all the subsequent layers of defense, unfortunately, are variations on looking for needles in haystacks.

Nevertheless, a comprehensive approach to reducing the risk of nuclear terrorism would also include efforts to block other steps on the terrorist pathway to the bomb, including new efforts to disrupt terrorist nuclear plots and their financing and recruitment; to interdict nuclear smuggling; to prevent and deter conscious state decisions to transfer nuclear weapons or materials to terrorists; to impede terrorist recruitment of nuclear experts; to reduce global stockpiles of nuclear weapons and fissile materials, and to end new production; and to place these stockpiles under international monitoring.

Solving these problems will not be easy. The low-hanging fruit has already been plucked. Complacency about the threat among policy makers and nuclear managers around the world, secrecy and sovereignty concerns, political disputes, and bureaucratic impediments all pose obstacles to expanded and accelerated progress that will be difficult to overcome. Making progress will require sustained White House leadership, creative approaches, a comprehensive, prioritized plan, and adequate resources. But if all of those can be put together, the next US president has an historic opportunity – an opportunity to reduce the danger of nuclear terrorism to a fraction of its current level during his first term in office, virtually eliminating nuclear terrorism as a major threat to the security of the United States and the world. The target should be to remove nuclear weapons and materials entirely from as many sites as possible worldwide, and ensure highly effective security for all the remaining locations where these stocks exist, by the end of the next president’s first term. That is a challenging goal – but US security demands no less. Preventing a terrorist nuclear attack must be a top international security priority – for the next US president, and for leaders around the world.

Preventing Nuclear Terrorism: Next Steps to Take

Achieve effective and lasting nuclear security

Launch a fast-paced global nuclear security campaign. The next US president, working with other world leaders, should forge a global campaign to lock down every nuclear weapon and every significant cache of potential nuclear bomb material worldwide, as rapidly as that can possibly be done – and to take other key steps to reduce the risk of nuclear terrorism. This effort must be at the center of US national security policy and diplomacy – an issue to be raised with every country with stockpiles to secure or resources to help, at every level, at every opportunity, until the job is done. The Global Initiative to Combat Nuclear Terrorism is a first step, which has been valuable in focusing countries’ attention on the issue of nuclear terrorism and building legal infrastructure, capacity for emergency response, law enforcement capabilities, and more – but it has not focused on rapid and substantial security upgrades for nuclear stockpiles, and demands little of countries to count as partners. A modified approach – focused on locking down all caches of nuclear weapons, plutonium, and HEU to high standards – is likely to be necessary to create the kind of fast-paced nuclear security campaign that is needed. To succeed, such an effort must be based not just on donor-recipient relationships but on real partnerships, which integrate ideas and resources from countries where upgrades are taking place in ways that also serve their national interests. For countries like India and Pakistan, for example, the opportunity to join with the major nuclear states in jointly addressing a global problem is more politically appealing than portraying the work as US assistance necessitated because they are unable to adequately control their nuclear stockpiles on their own. US-Russian relations have gone into a tailspin since the conflict in Georgia, making a real nuclear security partnership with Russia far more difficult to achieve, but no less essential – shared US-Russian interests in keeping nuclear material out of terrorist hands remain. Such partnerships will have to be based on creative approaches that make it possible to cooperate in upgrading nuclear security without demanding that countries compromise their legitimate nuclear secrets. Specific approaches should be crafted to accommodate each national culture, secrecy system, and set of circumstances.

Seek to ensure that all nuclear weapons, plutonium, and highly enriched uranium (HEU) are secure. Terrorists will get the material to make a nuclear bomb wherever it is easiest to steal. The world cannot afford to let stovepipes between different programs leave some vulnerable stocks without security upgrades – the goal must be to ensure effective security for *all* stocks worldwide. Today, security upgrades in Russia are nearing completion, and there is significant progress in Pakistan, but the promising nuclear security dialogue with China does not yet appear to have led to major improvements in nuclear security there, and India has so far rejected offers of nuclear security cooperation. Upgrades in Belarus were delayed for years by poor political relations (though they are now underway), and South Africa has not yet accepted nuclear security cooperation, despite the break-in at Pelindaba. Except for occasional bilateral dialogues, US programs largely ignore caches in wealthy developed countries, though some of these, too, are dangerously insecure. Sustained high-level leadership is needed to close these gaps. While specific tactics are likely to differ – achieving security upgrades in wealthy countries may be more about convincing them that action is needed than it is about paying for it ourselves – it is urgent to get past the assumption that everything in wealthy countries is adequately secured.

Expand and accelerate efforts to consolidate nuclear stockpiles. The next US president should place higher priority on working with countries to reduce drastically the number of sites where nuclear weapons and the materials to make them exist, achieving higher security at lower cost. The goal should be to remove all nuclear material from the world’s most vulnerable sites and ensure effective security wherever material must remain within four years or less – and to eliminate HEU from all civilian sites worldwide within roughly a decade. The Global Threat Reduction Initiative (GTRI) has greatly accelerated the pace at which research reactors are being converted from HEU to low-enriched uranium (LEU) that cannot be used in a nuclear bomb, and the pace of removing HEU from these sites to secure locations. But here, too, there are gaps that should be closed. New incentives should be offered so that much of the more than 13 tons of US-origin HEU not covered in current GTRI removal plans will be sent back or otherwise eliminated. A new program should be established to give unneeded reactors incentives to shut down (an approach which may be cheaper and quicker, especially for difficult-to-convert reactors). Over time, the United States should seek an end to all civil use of HEU. New efforts should be undertaken to limit the production, use, and stockpiling of weapons-usable separated civilian plutonium – including renewing the nearly-

completed late-1990s effort to negotiate a 20-year US-Russian moratorium on plutonium separation. And as nuclear energy expands and spreads, the United States should not encourage that spread to be based on approaches that involve reprocessing and recycling of plutonium, as some of the approaches envisioned in the Global Nuclear Energy Partnership (GNEP) would do; even the proposed GNEP processes that do not separate “pure plutonium” would tend to increase, rather than decrease, the risk of nuclear theft and proliferation compared to not reprocessing this fuel.

Gain agreement on effective global nuclear security standards. As nuclear security is only as strong as its weakest link, the world urgently needs effective global nuclear security standards that will ensure that all nuclear weapons and weapons-usable materials are protected against the kinds of threats terrorists and criminals have shown they can pose – at a bare minimum, against two small teams of well-trained, well-armed attackers, possibly with inside help, as occurred at Pelindaba. (In some countries, protection against even more capable threats is needed.) United Nations Security Council Resolution 1540 legally requires all countries to provide “appropriate effective” security and accounting for all their nuclear stockpiles. The time has come to build on that requirement by reaching a political-level agreement with other leading states on what the essential elements of appropriate effective security and accounting systems are, and then working to ensure that all states put those essential elements in place. Ultimately, effective security and accounting for weapons-usable nuclear material should become part of the “price of admission” for doing business in the international nuclear market.

Build sustainability and security culture. If the upgraded security equipment the United States is helping countries put in place is all broken and unused in five years, US security objectives will not be accomplished. The next US president should step up efforts to gain top-level commitments from Russia and other countries to sustain effective nuclear security for the long haul with their own resources. He should also intensify programs to work with countries around the world to build strong security cultures, putting an end to staff propping open security doors for convenience or guards patrolling with no ammunition in their guns. Building strong security cultures is a difficult policy challenge; the most important single element is convincing nuclear managers and all their security-relevant staff of the urgency of the threat (see “Leadership and Commitment,” below). As most nuclear managers only invest in expensive security measures when the government tells them

they have to, effective regulation is essential to effective and lasting security; the next US president should greatly increase the focus on ensuring that countries around the world put in place and enforce effective nuclear security and accounting regulations.

Beyond nuclear security

Beefing up nuclear security, so that nuclear material cannot be stolen and fall into terrorist hands, is the single step that can most reduce the risk of nuclear terrorism – the critical chokepoint on the terrorist pathway to the bomb. Once potential bomb material is outside the gate of the facility where it is supposed to be, it could be anywhere, and the difficulty of stopping a terrorist nuclear plot increases dramatically. Nevertheless, theft-prevention efforts cannot be expected to be perfect; an integrated system of approaches to stopping terrorist nuclear plots is needed.

Disrupt: counter-terrorism efforts focused on nuclear risks. The next US president should work with other countries to build an intense international focus on stopping the other elements of a nuclear plot – the recruiting, fundraising, equipment purchases, and more that would inevitably be required. Because of the complexity of a nuclear effort, these would offer a bigger and more detectable profile than many other terrorist conspiracies – although, as US intelligence officials have pointed out, the observable “footprint” of a nuclear plot might be no bigger than that of the 9/11 plot. The best chances to stop such a plot lie not in exotic new detection technologies but in a broad counter-terrorist effort, ranging from intelligence and other operations to target high-capability terrorist groups to addressing the anti-American hatred that makes recruiting and fund-raising easier, and makes it more difficult for other governments to cooperate with the United States. In particular, the United States should work with governments and non-government institutions in the Islamic world to build a consensus that slaughter on a nuclear scale is profoundly wrong under Islamic laws and traditions (and those of other faiths) – potentially making it more difficult for those terrorists wanting to pursue nuclear violence to convince the people they need to join their cause.

Interdict: countering the nuclear black market. Most of the past successes in seizing stolen nuclear material have come from conspirators informing on each other and from good police and intelligence work, not from radiation detectors. The next US president should work with other

countries around the world to intensify police and intelligence cooperation focused on stopping nuclear smuggling, including additional sting operations and well-publicized incentives for informers to report on such plots, to make it even more difficult for potential nuclear thieves and buyers to connect. The United States should also work with states around the world to ensure that they have (a) units of their national police forces trained and equipped to deal with nuclear smuggling cases, and other law enforcement personnel should be trained to call in those units as needed; and (b) laws on the books making any participation in real or attempted theft or smuggling of nuclear weapons or weapons-usable materials, or nuclear terrorism, crimes with penalties comparable to those for murder or treason. The next US president should develop an approach that offers a greater chance of stopping nuclear smugglers at lower cost than the current mandate for 100 percent scanning of all cargo containers, focusing on an integrated system that places as many barriers in the path of intelligent adversaries attempting to get nuclear material into the United States by *any* pathway as can be accomplished at reasonable cost, and work with Congress to get the modified approach approved. (In particular, it is important to understand that neither the detectors now being deployed nor the Advanced Spectroscopic Portals will have any substantial chance of detecting HEU metal with even modest shielding.)

Prevent and deter: reducing the risk of nuclear transfers to terrorists by states. Conscious state decisions to transfer nuclear weapons or materials to terrorists are a small part of the overall risk of nuclear terrorism; hostile dictators focused on preserving their regimes are highly unlikely to hand over the greatest power they have ever acquired to groups they cannot control, in ways that might provoke retaliation that would destroy their regimes forever. Nevertheless, this risk is not zero, and steps should be taken to reduce it further. The international community must convince North Korea and Iran to verifiably end their nuclear weapons efforts (and, in North Korea's case, to give up the weapons and materials already produced). At the same time, the global effort to stem the spread of nuclear weapons should be strengthened significantly, reducing the chances that other states might someday gain nuclear weapons that might fall into terrorist hands. The United States should also put in place the best practicable means for identifying the source of any nuclear attack – including not just nuclear forensics but also traditional intelligence means – and announce that the United States will treat any terrorist nuclear attack using material consciously provided by a state as an attack by that state, and will respond accordingly. This should include both increased funding for

R&D and expanded efforts to put together an international database of material characteristics. Policymakers should understand, however, that nuclear material has no DNA that can provide an absolute match: nuclear forensics will complement other sources of information, but will rarely make clear where material came from by itself.

Respond: global nuclear emergency response. The next US president should work with other countries to ensure that an international rapid-response capability is put in place—including making all the necessary legal arrangements for visas and the import of technologies such as the nuclear detectors used by the nuclear emergency search teams (some of which include radioactive materials)—so that within hours of receiving information related to stolen nuclear material or a stolen nuclear weapon anywhere in the world, a response team (either from the state where the crisis was unfolding, or an international team if the state required assistance) could be on the ground, or an aircraft with sophisticated search capabilities could be flying over the area.

Impede: impeding terrorist recruitment of nuclear personnel. The next US president should maintain existing scientist-redirection programs, but should reform them to use a broader array of tools and to focus on a broader array of threats, including not only top weapons scientists but workers with access to nuclear material, guards who could help steal nuclear material, and people who have retired from nuclear facilities but still have critical knowledge. For this broader mission, the United States is not likely to have either the access or the resources to do everything itself, but must work closely with partner countries to convince them to take most of the needed actions themselves. The next US president should also work with key countries such as Russia and Pakistan to strengthen control of classified nuclear information and ensure that they monitor contacts and behavior of all individuals with key nuclear secrets – and should work with a broader set of countries to monitor and stop recruitment attempts at key sites, such as physics and nuclear engineering departments in countries with substantial Islamic extremist communities.

Reduce: reducing stockpiles and ending production. The United States, Russia, and other nuclear weapon states should join in an effort to radically reduce the size, roles, and readiness of their nuclear weapon stockpiles, verifiably dismantling many thousands of nuclear weapons and placing the fissile material they contain in secure, monitored storage until it can be safely and securely

destroyed. Very deep reductions in nuclear stockpiles, if properly managed, would reduce the risks of nuclear theft – and could greatly improve the chances of gaining international support for other nonproliferation steps that could also reduce the long-term dangers of nuclear theft. As a first step, the next US president should launch a joint program with Russia to reduce total US and Russian stockpiles of nuclear weapons to something in the range of 1,000 weapons, and to place all plutonium and HEU beyond the stocks needed to support these low, agreed warhead stockpiles (and modest stocks for other military missions, such as naval fuel) in secure, monitored storage pending disposition. In particular, the United States and Russia should launch another round of reciprocal initiatives, comparable to the Presidential Nuclear Initiatives of 1991-1992, in which they would each agree to: (a) take several thousand warheads—including, but not limited to, all tactical warheads not equipped with modern, difficult-to-bypass electronic locks—and place them in secure, centralized storage; (b) allow visits to those storage sites by the other side to confirm the presence and the security of these warheads; (c) commit that these warheads will be verifiably dismantled as soon as procedures have been agreed by both sides to do so without compromising sensitive information; and (d) commit that the nuclear materials from these warheads will similarly be placed in secure, monitored storage after dismantlement. The next US president should also reverse the Bush administration’s misguided opposition to a verified fissile material cutoff treaty, and lead work with other governments to overcome the obstacles to negotiating such a treaty – while also seeking to end all production of HEU for any purpose, and to phase out civilian separation of weapons-usable plutonium.

Monitor: monitoring nuclear stockpiles and reductions. The next US president should work with Russia to revive efforts to put in place a system of data exchanges, reciprocal visits, and monitoring that would build confidence in the size and security of each side’s nuclear stockpile, lay the groundwork for deep reductions in nuclear arms, and confirm agreed reductions in nuclear warhead and fissile material stockpiles. Such a system should ultimately be expanded to cover other nuclear weapon states as well. In particular, the next US president should seek Russian agreement, before the 2010 Nonproliferation Treaty (NPT) review, that each country will place large quantities of excess fissile material under International Atomic Energy Agency (IAEA) monitoring.

Leadership and commitment

A maze of political and bureaucratic obstacles must be overcome – quickly – if the world’s most vulnerable nuclear stockpiles are to be secured before terrorists and thieves get to them. This will require sustained and creative leadership at many levels – at the highest levels of key governments around the world; in nuclear ministries and regulatory agencies; among intelligence, police, customs, and border control agencies; and at every nuclear facility or transport organization that handles nuclear weapons, plutonium, or HEU. Leadership from the next US president will be particularly critical, for the United States is the single country most focused on reducing the threat of nuclear terrorism. Several steps will be critical to overcoming the obstacles to expanded and accelerated progress in reducing the risk.

Building the sense of urgency and commitment worldwide. The fundamental key to success is to convince political leaders and nuclear managers around the world that nuclear terrorism is a real and urgent threat to *their* countries’ security, worthy of a substantial investment of their time and money – something many of them do not believe today. If these programs succeed in building that sense of urgency, these officials and managers will take the needed actions to prevent nuclear terrorism; without that sense of urgency, they will not. Some of this case is already being made, especially in the context of the Global Initiative to Combat Nuclear Terrorism and in discussions between key US intelligence officials and their foreign counterparts, but much more needs to be done. The United States and other countries should take several steps to build the needed sense of urgency and commitment, including: (a) *joint threat briefings* at upcoming summits and high-level meetings with key countries, where experts from both the United States and the country concerned would outline the very real possibility that terrorists could get nuclear material and make a nuclear bomb; (b) *nuclear terrorism exercises* with policymakers from key states, which can sometimes reach officials emotionally in a way that briefings and policy memos cannot; (c) *fast-paced nuclear security reviews*, in which leaders of key states would pick teams of security experts they trust to conduct fast-paced reviews of nuclear security in their countries (with US advice and technical assistance if desired), assessing whether facilities are adequately protected against a set of clearly-defined threats (as the United States did after 9/11, revealing a wide range of vulnerabilities); (d) *realistic testing of nuclear security performance*, in which the United States could help countries conduct realistic tests of their

nuclear security systems' ability to defeat realistic insider or outsider threats; and (e) *shared databases of threats and incidents*, including unclassified information on actual security incidents (both at nuclear sites and at non-nuclear guarded facilities) that offer lessons for policymakers and facility managers to consider in deciding on nuclear security levels and particular threats to defend against.

Putting someone in charge. The steps needed to prevent nuclear terrorism cut across multiple cabinet departments, and require cooperation in highly sensitive areas with countries across the globe. They will require sustained effort, day-in and day-out, from the highest levels of the US government – and other governments. Yet today, there is no one in the US government with full-time responsibility for all of the disparate efforts to prevent nuclear terrorism. The president who takes office in January 2009 should appoint a senior White House official who has the president's ear – probably a Deputy National Security Advisor – whose sole responsibility will be to wake up every morning thinking “what can we do today to prevent a nuclear terrorist attack?” Keeping this issue on the front burner at the White House day-in and day-out will be crucial to success. The next US president should also lean on Russia and other key countries to do the same.

Developing a comprehensive, prioritized plan. Today, the US government has dozens of programs focused on pieces of the problem of preventing nuclear terrorism, each of which has its own plan for its own piece – and no comprehensive, prioritized plan. There is no systematic mechanism in place for identifying the top priorities or where there may be gaps, overlaps, or inefficiencies. One of the first priorities of the new single leader must be to put in place a comprehensive, prioritized plan – and then continuously modify it as circumstances change. The administration and Congress should provide sufficient resources to ensure that steps that could significantly reduce nuclear terrorism risks are not budget-constrained.

Assigning adequate resources. Nuclear security is affordable: a level of security that could greatly reduce the risk of nuclear theft could be achieved for all nuclear stockpiles worldwide for roughly one-percent of annual US defense spending. The next US president and the US Congress should act to ensure that lack of money does not slow or constrain any major effort to keep nuclear weapons and the materials needed to make them out of terrorist hands.

Providing information and analysis to support policy. Good information and analysis on where the greatest risks, opportunities, and obstacles to progress lie will be crucial to preventing nuclear terrorism. The next US president should act to ensure that US and international policies to reduce the risk of nuclear terrorism are informed by the best practicable information, from intelligence, other information collection, and analysis – including independent analysis and suggestions from non-government institutions. The highest-leverage area for information collection and analysis is likely to be supporting policy efforts to improve security for nuclear stockpiles – answering questions ranging from which sites have particularly large and vulnerable stockpiles, to which nuclear facilities have poorly paid staff or corrupt guards, to which research reactors are underutilized, underfunded, and might be convinced to shut down with a modest incentive package.

Putting the United States' own house in order

The most urgent nuclear security vulnerabilities are largely in other countries. But there is much more than can and should be done within the United States itself as well, as recent incidents in the US Air Force make clear. Convincing foreign countries to reduce and consolidate nuclear stockpiles, to put stringent nuclear security measures in place, or to convert their research reactors from HEU to LEU fuel will be far more difficult if we are not doing the same at home. The Department of Energy (DOE) should continue providing funding to convert US research reactors to LEU. Congress should provide funding for DOE to help HEU-fueled research reactors, or research reactors that pose serious sabotage risks, to upgrade security voluntarily. At the same time, Congress should direct the Nuclear Regulatory Commission (NRC) to phase out the exemption from most security rules for HEU that research reactors now enjoy, and provide funding for DOE to help these reactors pay the costs of effective security. Congress should also insist that NRC revise its rule exempting HEU that is radioactive enough to cause doses of more than one Sievert per hour at one meter from almost all security requirements, as recent studies make clear that this level of radiation would pose little deterrent to theft by determined terrorists. The NRC's requirements for protection of potential nuclear bomb material should be strengthened to bring them roughly in line with DOE's rules for identical material (particularly since the NRC-regulated facilities handling this material are doing so mainly on contract to DOE in any case, so DOE will end up paying most of the costs of security as it does at its own sites). Congress should also provide incentives to convert

HEU medical isotope production to LEU, without in any way interfering with supplies, by imposing a roughly 30% user fee on all medical isotopes made with HEU, with the funds used to help producers convert to LEU. This would give producers a strong financial incentive to convert, and since the isotopes are a tiny fraction of the costs of the medical procedures that use them, would not significantly affect the costs or availability of these life-saving procedures.

Fulfilling the United States' own part of the nonproliferation bargain is also likely to be a critical part of putting the United States in a position to lead. Article VI of the NPT obligates the nuclear weapon states to pursue disarmament in good faith, and the NPT non-nuclear-weapon states overwhelmingly believe that this obligation has not been fulfilled. The Bush administration's refusal to even discuss the 13 steps toward disarmament that had been agreed by all at the 2000 NPT review contributed to the collapse of the 2005 review. The next president will have to take quick action – in both words and deeds – to change the politics before the 2010 review. Progress on Article VI, if properly handled, can significantly increase the chances of getting many countries to sign on to tougher action to secure nuclear stockpiles.

Finally, no matter what is done to prevent nuclear terrorism, it is essential that the United States get better prepared should such a catastrophe nevertheless occur. While some steps have been taken to prepare for the ghastly aftermath of a terrorist nuclear attack, a comprehensive plan and approach is needed. The United States needs a rapid ability to assess which people are in the greatest danger and to tell them what they can do to protect themselves. Better capabilities to communicate to everyone, when TV, radio, and cell phones in the affected area may not be functioning properly are also needed, as are much better public communication plans for the critical minutes and hours after such an attack. The US government needs to do a much better job encouraging and helping people to take simple steps to get ready for an emergency. The United States also needs to put in place a better ability – including making use of the military's capabilities – to treat many thousands of injured people, along with more effective plans to keep the government and economy functioning while taking all the steps that will be needed to prevent another attack. (In particular, Congress has not yet acted to put a plan in place for reconstituting itself should most members of Congress be killed in a nuclear attack.) Many of these steps would help respond to any catastrophe, natural or man-made, and would pay off even if efforts to prevent a terrorist nuclear attack succeeded.

Immediate steps on taking office

On taking office, the next US president should take several steps immediately:

1. **Issue a directive making clear that preventing nuclear terrorism will be a top priority for US national security policy and diplomacy.** The president should make clear that preventing nuclear terrorism will be a central agenda item with every country with stocks to secure or resources to help.
2. **Appoint a senior leader with the president's confidence to take full-time charge of efforts to prevent nuclear terrorism.** This appointment should be made early, and it should be some one seen as being able to speak and act for the president.
3. **Establish interagency "tiger teams" to develop approaches to overcoming the obstacles to progress for each major country with stockpiles to secure – and for developing global nuclear security standards.** The obstacles to gaining cooperation for nuclear security upgrades or removals of nuclear material in many key countries are difficult and complex. It will take creativity and the use of the capabilities of many agencies to find the packages of incentives and disincentives needed to overcome these obstacles. The same is true of gaining agreement on effective standards for nuclear security. The next president and his senior leader for nuclear terrorism should immediately establish interagency teams to develop new approaches to getting these jobs done.
4. **Seek an appropriation in the range of \$1 billion, to be available until expended, that can be spent flexibly on high-priority actions to reduce the risk of nuclear theft.** Such a flexible pool of funds would give the new administration the ability to hit the ground running. Congress will have to pass a new budget for the remainder of FY 2009 by March 6, when the current continuing resolution expires, and the new president should seek to include this funding in that new budget.

Coping with the danger of nuclear terrorism will pose a fundamental challenge for the next president and the next Congress. With a sensible strategy, adequate resources, and sustained leadership, the risk of nuclear terrorism can be dramatically reduced during the next president's first term.