



Planning for Success at the 2014 Nuclear Security Summit

December 2013

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A 4:30 a.m. Wake-Up Call

In the dead of night on July 28, 2012, three senior citizens, including an 82-year-old Catholic nun, Sister Megan Rice, broke into the Y-12 National Security Complex near Oak Ridge, Tennessee, site of the US Highly Enriched Uranium Materials Facility (HEUMF). This self-proclaimed “Fort Knox of uranium” is America’s central repository for weapons-grade uranium.¹

Having cut through four separate fences, including three surrounding the HEUMF, setting off alarms along their way, and passing signs warning that the use of deadly force was permitted against trespassers, the three protesters hammered, spray-painted, and poured human blood on the outer walls of the building. One message proclaimed, “The Fruit of Justice Is Peace.”² They also unwittingly hammered at the base of a guard tower at the northwest corner of the HEUMF.³ Shortly thereafter, a single officer arrived, and eventually he arrested them as they knelt and sang “This Little Light of Mine.”

The security failings revealed by the nun and her fellow protesters are legion. The protesters were on the site for over an hour and 20 minutes, trekking about seven-tenths of a mile as the crow flies, but far longer as they traversed a steep ridge.⁴ They pierced fences equipped with sophisticated sensors.⁵ Yet the Y-12 Protective Force failed to spot them until they enjoyed unimpeded access to the exterior of the HEUMF for about 20 minutes.⁶ Had these individuals been well-armed, well-equipped terrorists, instead of Bible-toting peace protesters, the incident would have been far more dire.

Moreover, the initial failures to spot and intercept the intruders were compounded by the guard force response to their presence. Although the protesters had set off alarms, officers were not promptly sent to assess the problem, because they had become inured to false alarms. When a single responding officer finally arrived, he failed first to notice the protesters until they approached him and then to secure the area or ensure that the intruders could not pose a threat. Instead, he initially remained in his patrol car, talking on his cell phone with his supervisor. Once he left his vehicle, the officer did not draw his weapon and allowed the protesters to move about retrieving their supplies.

Incredibly, he also failed to protect his weapon from being taken by the intruders and used against him. Finally, the first responder violated orders to provide cover until the supervisor could don a bulletproof vest. Again, had the nun and her colleagues been terrorists, both the responding officer and his supervisor would very likely be dead.

Those were not, however, the only failures by Y-12 protective forces in response to the break-in. An officer inside the HEUMF violated established policy and used an unauthorized camera to assess the security zone breached by the intruders. He failed to detect the protesters, although a later review of the associated video recording revealed that the camera had captured an image of them. Another officer silenced an alarm set off by the intruders without using a gun port or viewing glass to search for the cause of the alert. Inexplicably, he had assumed that the protesters—who were pounding with a claw hammer and a small sledgehammer on the walls

of the building he was ostensibly guarding—were maintenance workers, *at 4:30 a.m.*⁷

Not surprisingly, the Department of Energy inspector general found problems with a wide range of security operations, including camera and sensor malfunctions, false alarms, maintenance deficiencies, confusion about what sensors were critical to the security mission, and inadequate communications equipment.⁸ A separate reviewer found that “a false alarm rate surpassing by orders of magnitude anything I have ever encountered before was accepted as a fact of life.”⁹ The contractors operating the Y-12 facility complained that inadequate federal funding diminished their ability to maintain effective security.¹⁰ (The fiscal year 2012 budget for security of the Y-12 uranium inventory and physical plant was about \$150 million.)¹¹ Independent reviewers appointed by then-Secretary of Energy Steven Chu found significant deficiencies in management, culture, and organization affecting Y-12’s security to be root causes of the breakdown.¹²

One of the reviewers appointed by Chu, Norman Augustine, concluded, “Disconcertingly, I can see little reason why, under the specific prevailing circumstances, the intruding group could not have included, in addition to the three persons actually participating in the incursion, a well-armed follow up group. I must disclose that I have been involved in dozens of failure analyses of a variety of types during my career, and none has been more difficult for me to comprehend than this one.”¹³

Thomas D’Agostino, who led the National Nuclear Security Administration, which oversees Y-12, called the incident “a completely unacceptable breach of security and an important wake-up call for our entire complex.” More ominously, he warned that, “*We believe that this incident raises important questions about the security of Category I [i.e., weapons-grade] nuclear materials across the DOE complex.*” (emphasis added)

Four months to the day after President Barack Obama returned from the Seoul Nuclear Security Summit, the country that had begun the summit process, that was most vocal on the importance of nuclear security and the threat of nuclear terrorism, that was assumed to be most rigorous in maintaining effective nuclear security, suffered a security crisis at a facility that had once been held up as a model for other sites. Moreover,

the incident called into question the security of nuclear material across the US nuclear weapons complex. This incident raises important questions that must be answered. How could this have happened? What lessons can be learned to improve the outcome of the 2014 Hague Nuclear Security Summit?

Complacency led to failure, according to Neile Miller, former acting administrator of the National Nuclear Security Administration. She observed that, “We have been running a system a certain way for such a long time and not really thinking about whether it was working or not.”¹⁴ Augustine summarized the root cause of the problem by saying, “The fundamental problem was one of culture: a pervasive culture of tolerating the intolerable and accepting the unacceptable.”¹⁵

Thus, the profound lesson of the Y-12 debacle is that nuclear security requires constant attention and improvement. Complacency is the enemy. An organizational culture that encourages constructive self-assessment and criticism, backed by rigorous testing and oversight, is critical. In nuclear security, ambition is required. Even the best systems are capable of mistakes.

An Empirical Record of Nuclear Insecurity

The Y-12 incident was not an isolated failure in nuclear security. In November 2007, four gunmen attacked South Africa’s Pelindaba facility, where an estimated 25 nuclear weapons’ worth of highly enriched uranium (HEU) is stored. The intruders penetrated several layers of security, went undetected for 45 minutes, and eventually broke into a control room, where they shot and seriously wounded an off-duty employee (who was there because he was worried about the safety of his girlfriend). A second assault team launched a simultaneous attack on the site from a different direction, but guards were able to repel them. The South African government downplays the incident as common criminality, but two teams of armed intruders attacking the site of a significant stock of weapons-grade nuclear material is a serious problem.¹⁶

Moreover, there is substantial further evidence of failure to protect fissile materials. Over the past 20 years, in a score of cases, law-enforcement officers or border guards have seized HEU or weapons-grade plutonium outside of authorized control, including incidents in 2003, 2006, 2010, and 2011, in Georgia and Moldova. While none

of these cases involved enough material to make a nuclear weapon, they are grave for two reasons: first, in many of the cases, the individuals involved claimed that the material was a sample of a larger quantity for sale; and, second, the cases constitute physical proof of nuclear security failure.¹⁷

Thus, despite years of efforts and billions of dollars spent by the United States and its partners, leading to numerous and tangible improvements in nuclear security, and even after Obama called the matter to the attention of world leaders, we continue to see evidence of breakdowns or near misses.

The Y-12 incident was not a wake-up call merely for the United States. It and a score of other nuclear security incidents must rouse all states with fissile material to greater vigilance and inform their actions at the 2014 Nuclear Security Summit. These failures in nuclear security must compel actions by the leaders at The Hague in 2014. The need to improve nuclear security remains urgent and real.

The Washington and Seoul Nuclear Security Summits

Obama gathered the first Nuclear Security Summit in March 2010. He used his enormous popularity to attract nearly 50 world leaders and focus their attention on the problem he cited as the most serious threat to international peace and security: the risk of nuclear terrorism. Effective nuclear security was his proposed solution to that threat.

The Washington summit succeeded in establishing a consensus that nuclear terrorism is a serious threat to all nations and that all vulnerable material should be locked down within four years. The summit also very likely created a constructive dynamic within governments, with leaders directing their subordinates to attend to nuclear security and to avoid incidents that could embarrass them (although this did not prevent the Y-12 incident).

More tangibly, raising the issue among heads of government and state helped to break through bureaucratic impasses that had stalemated actions planned for years. The Washington summit evoked some 68 specific national commitments to take tangible actions to improve nuclear security or governance, for example, converting research reactors fueled with highly enriched uranium to low-enriched uranium (LEU) and repatriating the fresh and spent fuel or joining a relevant international convention.

By February 2012, over 80 percent of the national commitments had been completed and all but one of the remainder were in progress; since then, at least six more commitments have been completed, raising the success rate to over 90 percent.¹⁸

The Washington summit also produced a seven-page work plan with specific objectives, such as universal implementation of the conventions on physical protection of nuclear material (as amended) and suppressing acts of nuclear terrorism, improving national laws and regulations, and bolstering the International Atomic Energy Agency (IAEA).¹⁹ However, except for adoption of the conventions, the work plan generally calls for ongoing efforts rather than tasks that can be completed.

Despite substantial accomplishments, the Washington summit also fell short of reasonable expectations in several respects. The Washington summit communiqué, although nonbinding (as are all such documents), was vague, and its commitments were caveated. The leaders could not agree on an assessment of the nuclear terrorism threat. Similarly, they could not agree on a baseline level of protection for weapons-usable nuclear material. They showed no interest in learning lessons from the score of incidents in which weapons-grade nuclear material has been seized outside of authorized control.

The 2012 Seoul Nuclear Security Summit produced a communiqué covering 11 topics and setting out a number of specific actions to be taken in those areas (see Appendix).²⁰ These subjects ranged from the role of the IAEA to the relationship between safety and security, and the need to develop further national capabilities to combat illicit nuclear trafficking. None, however, were of a nature that they could be definitively accomplished. Rather, like the Washington work plan, the Seoul communiqué offered pledges of ongoing or renewed efforts.

As in Washington, national commitments were an important feature of the Seoul summit. Indeed, 49 of the 53 participating states made them.²¹ The Seoul summit also had an innovation sometimes referred to as “gift baskets,” that is, commitments to take steps to improve nuclear security made by groups of states acting in concert. Such undertakings can be even more powerful than individual national commitments because cooperation often entails a greater scope of action. For example,

Belgium, France, South Korea, and the United States agreed to cooperate to develop high-density fuel that would enable additional research reactors to be converted from HEU to LEU.

Unfortunately, then-current events at the Seoul summit diffused the laserlike focus of the Washington summit on nuclear security. Nuclear safety, radiological security, North Korean proliferation, and even missile defense competed for the attention of both the national leaders and the international media covering them.

Where Do We Go From Here?

Broadly speaking, advocates of improved nuclear security fall into two camps: transformationists and incrementalists. The transformationists believe that a fundamental overhaul is necessary, that the current system needs to be rationalized or that larger purposes such as disarmament must also be addressed. The incrementalists believe that all the major pieces necessary for effective nuclear security are in place, but better implementation, security cultures, and a few specific measures are required to improve the system. (Very likely, adherents of both camps will find this distinction oversimplified, but it is nonetheless useful to illustrate the broad options.)

The Nuclear Security Governance Experts Group (NSGEG), sponsored in part by the Stanley Foundation, offers a good example of the transformationist perspective. Before offering 30 separate recommendations, a recent NSGEG report concludes:

The current nuclear security regime is not robust, adaptable, or coherent enough to adequately protect against the intensifying threats posed by nuclear terrorism in the 21st century. The governance system for nuclear security is in need of significant improvement in three areas: greater coherence and confirmed effectiveness, enhanced transparency, and increased international confidence, including through shared assessments of performance and cooperation.²²

Thus, the NSGEG seeks a fundamental transformation in how countries manage nuclear security nationally and internationally.

Other transformationists favor even more extensive measures, implicitly or explicitly (although

not necessarily commenting specifically on the agenda at the nuclear security summits). Writing before the Washington summit, and seeking to avoid nuclear disorder eclipsing the financial panic of 2008–2010, Graham Allison bundled nuclear security with nonproliferation and disarmament as threats to international security.²³ Ambassadors Steven Pifer and James Goodby proffer a proposal for a unified nuclear enterprise aimed at zero nuclear weapons while acknowledging the need for improved nuclear security in the interim. Their paper is designed to advance “a framework inaugurated by George Shultz, William Perry, Henry Kissinger, and Sam Nunn to promote a world without nuclear weapons.”²⁴ Indeed, those four statesmen have offered their own vision of nuclear reform encompassing both arms control and nuclear security.²⁵

The NSGEG argument that the present nuclear security structure lacks coherence has appeal. The current structure was built over time, as new threats were identified and addressed, sometimes by treaty, sometimes by executive agreements or ad hoc arrangements, and sometimes by individual states taking unilateral action. Inevitably, this haphazard construction lacks the elegance of a planned architecture.

There are, however, reasons why the nuclear security edifice was added onto gradually. New treaties are cumbersome and time-consuming to negotiate. The Nuclear Non-Proliferation Treaty is likely impossible to amend, given the number and diversity of states required to ratify changes. Fixing a newfound hole in a wall can be urgent and important, requiring a quick patch, not a re-designed structure. Rambling Victorian and sleek Bauhaus designs both offer protection.

As for broader disarmament and nonproliferation issues, the organizers of the Washington summit chose wisely when they explicitly excluded such matters from the meeting’s agenda. Highly controversial, these topics would have served only to divert the leaders’ attention from the nuclear security realm, where national interests are more compatible and consensus on next steps is more likely.

Several examples of incrementalist agenda items are available. The Nuclear Threat Initiative, through its Global Dialogue on Nuclear Security Priorities,²⁶ has advanced the concept of “assurances,” statements and actions by states that could help build the confidence of other governments, international

organizations, and the public in their efforts to secure dangerous nuclear material, while protecting sensitive information. “[I]n most cases the activity is not new (meaning that it is already practiced or engaged in by states or relevant stakeholders in some form).”²⁷ According to the Nuclear Threat Initiative, examples of assurances include information sharing, peer review, best-practice sharing, bilateral cooperative measures, declarations, accounting, training, and certification.²⁸

The US government has also taken an incrementalist approach to the nuclear security summit agenda. American delegates insisted on a narrow focus on nuclear security for the Washington meeting rather than opening more divisive topics, such as nonproliferation or disarmament. In Seoul, they resisted, with limited success, the introduction of nuclear safety and radiological security as topics for discussion.

Approaching the Hague summit, the US administration speaks of a “global architecture for nuclear security,” describing United Nations Security Council Resolution (UNSCR) 1540 as its keystone and the two conventions on physical protection of nuclear material and suppressing acts of nuclear terrorism as its cornerstones.²⁹ The nuclear security summits, the G-8 Global Partnership Against the Spread of Weapons and Materials of Mass Destruction, the World Institute for Nuclear Security (WINS), and other initiatives are cited as building blocks in the architecture.

As described by the Obama administration, the nuclear security architecture “should be guided by several principles. The architecture should be comprehensive, it should be based on international standards, it should support the identification and recognition of assurances relating to nuclear security, and it should encourage declining stocks of usable fissile material.”³⁰ Thus, in practice and in principle, the United States favors adjustments to the current system amounting to an incrementalist approach.

As individual actions, such as HEU reactor conversions, are completed, the focus of the work will shift over time from urgent patches to fill security holes, to sustaining effective security on an ongoing basis. As noted earlier, this is largely a question of maintaining a healthy culture and ensuring that any threats to that culture are diagnosed and treated at an early stage. Thus, many

of the most important actions will address issues of training, testing, professional standards, and best practices, rather than the guns, guards, and gates that were the focus of actions in the past. If we do not invest in sustaining effective security cultures, the money invested in physical protection will likely have been spent in vain.

A Substantive Agenda for the Hague Summit

The following actions would address significant remaining deficiencies in the world nuclear security system and could be undertaken by countries in concert or alone. Such actions could be implemented as national commitments for the 2014 Hague Nuclear Security Summit or collectively through a joint statement.

1. Remove or downblend significant stocks of weapons-usable material

Some 26 countries have removed all such material from their territories, halving the number of countries that possessed it in 1992. Despite this substantial progress in removing weapons-usable material, the work is not done. Material in three countries in particular—Belarus, Japan, and South Africa—stands out because of its quality and quantity, and because it is retained by non-nuclear weapons states.

Belarus permitted the removal of 85 kilograms of HEU in November 2010, but suspended an agreement to remove an additional 230 kilograms in August 2011, in response to US economic sanctions,³¹ imposed in the wake of a political crackdown. This weapons-grade material should be a top priority. It is also a further opportunity for the United States and Russia to work together, as Moscow likely has more influence in Minsk than any other foreign government.

While Japan has been an active participant in the Reduced Enrichment for Research and Test Reactors program, designed to convert research reactors to LEU and to return fresh and spent HEU fuel, 500 kilograms of weapons-grade HEU remain for use by its Fast Critical Assembly facility.³² The Fast Critical Assembly was intended to test advanced reactor designs, which are now unlikely ever to be used, given the uncertainty surrounding even Japan’s existing light water reactor fleet in the wake of the Fukushima disaster. The

HEU should be returned to the United Kingdom for downblending.

South Africa retains an estimated 450 to 600 kilograms of fresh HEU, which is a legacy of its nuclear weapons program.³³ As noted earlier, the Pelindaba site, which stores the material, has already suffered a coordinated armed attack. This material should be downblended to LEU. The SAFARI-1 research reactor has already been converted to use LEU and is producing molybdenum-99, so there is no obvious remaining use for HEU in South Africa.³⁴ As the only country to manufacture indigenously and then to eliminate nuclear weapons, South Africa has strong nonproliferation credentials. They could be burnished further by downblending the stock of indigenously produced HEU for use in its civilian nuclear energy program.

2. Minimize the number of sites using or storing HEU

As noted above, substantial work has been done to convert reactors from HEU to LEU fuel and to repatriate the HEU fresh and spent fuel. Nonetheless, Russia continues to operate dozens of facilities, far more than any other country in the world, which use or store HEU. According to the Nuclear Threat Initiative, “As of May 2011, there were 71 Russian nuclear facilities listed as within the scope of the newly expanded Global Threat Reduction Initiative, including eight pulsed reactors, 15 ice-breakers, and 21 critical assemblies, as well as several reactors that have already been shut down.”³⁵ Moreover, there are likely additional facilities using HEU that are outside the identified scope because they are operated for military purposes but that could also be consolidated or closed.

Last year, the US National Nuclear Security Administration and Russia’s Rosatom completed a study of converting four reactors from HEU to LEU and found it to be feasible. One, and perhaps two, reactors will likely be converted by 2014, and a further nine will be shut.³⁶ Nonetheless, the Russian government should work to consolidate the number of sites storing or using HEU. Such actions would not only improve security but also lead to substantial cost savings.

3. Provide nuclear security assurances

One way states could build the confidence of others that their nuclear security measures are

effective would be to pursue specific steps that would lend insight into the quality of their work without revealing sensitive information. If implemented diligently, assurances can also address the problem of sustaining security improvements over time and maintaining a healthy nuclear security culture—preventing lapses like the 2012 Y-12 incident. Many of these steps are already being taken by at least a few nations. The Nuclear Threat Initiative has cataloged specific measures and grouped them by category³⁷:

- Information sharing and reporting.
 - Convention on the Physical Protection of Nuclear Materials (CPPNM) Article 14 report.
 - UNSCR 1540 report.
 - Publication of broad outlines of security regulations.
- Peer review.
 - Hosting an IAEA International Physical Protection Advisory Service review.
 - Hosting a corporate governance peer review.
- Best-practice sharing.
 - Participating in WINS workshops and implementing WINS best-practice guides.
 - Bilateral or multilateral best-practice exchanges, including through the Global Initiative to Combat Nuclear Terrorism.
 - Tabletop exercises.
- Bilateral cooperative measures.
 - Compliance with nuclear cooperation agreements, including physical protection assessments.
 - Bilateral nuclear security assistance.
- Regular declarations about:
 - Quantities of materials.
 - Accounting processes.
 - Regulatory oversight.
- Certification of professional competence.
 - WINS Academy.
 - International Organization for Standardization.

Voluntary commitments by a large group of nations to the broad range of activities cited above would create de facto objective standards for measuring confidence in a country’s nuclear security

processes. While they would not ensure effective security at any particular site, effective assurances would help to develop the incentives for maintaining strong security cultures. Summit participants could undertake this action through a joint statement or, failing that, through a joint national commitment by a smaller group of willing parties. (Of course, they also could be pursued independently of the nuclear security summit process.)

4. Exercise nuclear security leadership

Effective nuclear security demands ambitious and ongoing efforts. While not all summit participants need to undertake the most rigorous steps, because many states do not possess weapons-usable material, those with significant nuclear enterprises should be willing to lead. They have the greatest stake in the success of nuclear operations and the greatest expertise to achieve it.

Several possible groups might form the core of such leadership: the nuclear weapons states defined by the Nuclear Non-Proliferation Treaty; hosts of the nuclear security summits; or simply those states with the largest stocks of fissile material. Other states, such as those with acknowledged nuclear weapons programs, could be welcomed to match the leaders' commitments, broadening the base of participating countries. Elements of the commitment could include:

- Ensuring that all stocks of nuclear weapons, HEU, and separated plutonium are protected to a level secure against the full range of plausible threats by insiders and outsiders identified by a state's intelligence and law-enforcement organizations.
- Ensuring that all such weapons and material are effectively controlled and accounted for to detect attempts to steal them, including with physical inventories as needed.
- Maintaining sufficient funding to ensure that guard forces are appropriately paid, trained, armed, and equipped.
- Reducing to a minimum the number of sites where fissile material is stored or used, thereby maximizing the effectiveness of security expenditures.

- Implementing effective testing, regulatory oversight, peer review, and best-practice exchanges to ensure that these standards are maintained.

5. Provide sufficient resources to international nuclear security organizations

The IAEA Office of Nuclear Security has seen its total budget (including the core and voluntary contributions) grow from about \$10 million to about \$30 million over the past decade. It interacts with the governments of member states, not industry or other custodians of fissile material. Yet it has the capacity and resources to conduct just eight to ten International Physical Protection Advisory Service missions each year—despite the fact that dozens of countries have nuclear power plants or fissile material stocks.³⁸ About 80 percent of the Office of Nuclear Security's budget is funded with voluntary contributions, and about 90 percent of those contributions are made with restrictions on the places where or purposes for which they may be spent.³⁹ This constrains the IAEA's ability to set and execute coherent program priorities.

Therefore, the IAEA Office of Nuclear Security's budget should be rebalanced toward a greater share coming from its core budget, rather than voluntary contributions, and the overall budget should match increased demands for security capacity and nuclear industry expansion.

WINS advances the sharing of best practices among those responsible for fissile material. Therefore, it deals directly with facility operators, including in the private sector. It has conducted over 40 best-practice workshops and published over 30 best-practice guides. Among thousands of workshop participants and WINS members, roughly 85 percent say that their security practices have changed because of insight from WINS. WINS operates on a very small budget, about a tenth of the IAEA's Office of Nuclear Security. It is capacity constrained by funding.

National commitments should be made at the Hague summit to improve the IAEA Office of Nuclear Security's core budget and flexibility in using voluntary contributions, and WINS's overall budget. Relatively modest sums of a few million dollars could make an enormous difference in the capacity of both organizations

(e.g., a series of national commitments to provide \$250,000 to \$500,000 in contributions to each organization).

Maintaining Momentum for Improved Nuclear Security

In June 2013 in Berlin, Obama stated his intention to host another nuclear security summit in 2016. Very likely, that will mark the end of such biannual meetings. The summits have had real merit. They have:

- Focused high-level attention on the issue.
- Fostered a consensus on the importance and urgency of the problem.
- Facilitated breakthroughs against bureaucratic obstacles and inertia.
- Forced implementers to accept deadlines for completing their actions.

Nonetheless, leaders are already showing signs of nuclear security summit fatigue. Although the 2012 Seoul meeting had more participants than the 2010 Washington meeting, it also saw a 50 percent increase in representatives below the level of head of government or state. Some countries sought a statement that the Hague summit would be the last such meeting. At each of the meetings, organizers have struggled to balance giving participants an equal say in the proceedings on topics they can productively discuss and avoiding a series of sterile speeches. Moreover, the subject matter can be highly technical and not easily mastered by politicians more accustomed to broader issues of national strategy.

How, then, can the advantages of the nuclear security summit process be maintained while recognizing that the 2016 summit will likely end the biannual series?

First, a word on pitfalls to be avoided. The nuclear security summits have succeeded in part because of their focus on security, to the exclusion of nonproliferation and disarmament. These issues engender so much controversy that they form a barrier to constructive dialogue on security. Similarly, organizers of the summits have sought to create real dialogue rather than a series of speeches. If future meetings devolve into sequential but unrelated prepared speeches, without a coherent

conversational thread, the value of high-level dialogue will be greatly diminished.

The momentum of the nuclear security summits might be continued through the following system:

- Annual meetings with summit-participant countries and organizations represented at the undersecretary/deputy foreign minister level, including foreign ministries and ministries responsible for nuclear material.
- An agenda to review progress toward effective nuclear security, including:
 - Examination of any significant security failures for lessons learned and assurance of corrective action.
 - Examination of any significant incidents of nuclear trafficking for lessons learned and assurance of corrective action.
 - Implementation of relevant obligations, including the CPPNM (including reporting), International Convention for the Suppression of Acts of Nuclear Terrorism, and UNSCR 1540 reporting.
 - Nuclear-security-assurances implementation.
 - Financial and in-kind support for nuclear security organizations (e.g., the IAEA Office of Nuclear Security and WINS).
 - Continued unilateral and multilateral joint commitments and progress in fulfilling them.
- Expert-level groups making substantive preparations for the political-level meetings.
- Quadrennial nuclear security summits that would allow leaders to review progress toward effective nuclear security as specified above, focusing on the big picture and larger trends.

Such a system would continue the benefits accrued by the nuclear security summits—high-level attention, fomenting a sense of urgency and responsibility among leaders, and creating opportunities to cut through bureaucratic inertia preventing action—while recognizing that a two-year summit cycle is not sustainable indefinitely.

Conclusion

Should a major nuclear security incident kill hundreds or thousands of people, no one can say we were not warned. We have seen repeated failures

in our ability to protect weapons-grade HEU and plutonium. Those failures occurred around the globe and steadily over the past 20 years, despite enormous efforts to improve security and real accomplishments in doing so.

Leaders at the upcoming Hague and Washington Nuclear Security Summits have the opportunity to take actions that would materially improve international security. Moreover, such actions would cost very little, and certainly almost nothing in comparison to the potential toll of a security failure. The nuclear security summits have accomplished a great deal, but not yet enough to make us safe.

The threat of nuclear terrorism remains urgent and real. Ambition is essential to meet it. Complacency will doom us to failure.

Acknowledgement: As with an earlier policy analysis brief written before the Seoul Nuclear Security Summit, I would like to acknowledge the significant substantial intellectual contributions of my colleague Matthew Bunn to the ideas presented in this paper.

Appendix:

Seoul Communiqué Commitments⁴⁰

- Eliminating and disposing of highly enriched uranium (HEU) no longer in use.
- Minimizing the use of HEU.
 - Encouraging voluntary announcements by the end of 2013 of specific actions to minimize the use of HEU.
- Welcoming international efforts to develop high-density low-enriched uranium (LEU) fuel for the purpose of replacing HEU fuels in research reactors and medical isotope production facilities.
- Seeking to bring the 2005 amended Convention on the Physical Protection of Nuclear Materials into effect by 2014.
- Welcoming an international conference in 2013 organized by the IAEA to coordinate nuclear security activities.
- Encouraging voluntary contributions to the IAEA Nuclear Security Fund.
- Developing options for national policies on HEU management within the framework of the IAEA.
- Encouraging national measures and international cooperation to prevent radiological terrorism.
- Strengthening the physical protection of nuclear facilities and enhancing emergency response capabilities in the case of radiological accidents while comprehensively addressing nuclear security and nuclear safety concerns.
- Strengthening the management of spent nuclear fuels and radioactive wastes.
- Strengthening the protection of nuclear materials and radioactive sources in transport.
 - Encouraging the establishment of a system to effectively manage and track such materials on a national level.
- Preventing the illicit trafficking of nuclear materials.
 - Strengthening technical capabilities to search for and detect illicitly trafficked nuclear materials and encouraging the sharing of information on persons involved in such activities by cooperating with INTERPOL.
- Building nuclear forensics capacity to identify the source of illicitly trafficked nuclear materials.
- Welcoming the establishment of Centers of Excellence for training and education in nuclear security, and supporting networking activities between each center.
- Strengthening the nuclear security culture.
 - Encouraging the participation of industry, academia, the media, [nongovernmental organizations], and other civil actors in the discussions on nuclear security.
- Strengthening the protection of sensitive nuclear security-related information and enhancing cybersecurity at nuclear facilities.
- Promoting international cooperation, such as the provision of assistance to countries for the enhancement of national nuclear security capabilities upon request.
- The hosting of the next nuclear security summit in the Netherlands.

Endnotes

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