

The Nuclear Security, Industry and Knowledge Summits¹

The Nuclear Security Summit Process

More than 50 world leaders gathered biennially between 2010 and 2016 to confront the challenge of preventing nuclear terrorism and improving global nuclear security. During this period, more than 1,500 kilograms of highly-enriched uranium and separated plutonium were recovered or eliminated. Twelve countries became HEU-free, and more than a dozen countries established centres of excellence for training, education and research. Furthermore, in the wake of political pressure from the NSS process and the Fukushima accident that occurred in 2011, many States updated their national laws and regulations on nuclear safety and security.

Through regular meetings, information sharing, and voluntary commitment making, the NSS process generated support for strengthening nuclear security measures and expanded the responsibility that all countries have to prevent nuclear terrorism. While acknowledging that nuclear security is a national responsibility, the summits operated on the basis of international cooperation and stressed the world's shared interest in reducing the vulnerabilities from nuclear materials that are not adequately secured.

The objective of strengthening nuclear security measures through “responsible national actions and sustained and effective international cooperation” was enshrined in the 2010 NSS consensus communiqué. Fissile material removal and protection efforts dominated the early focus of the summit process, but the agenda gradually broadened to include radiological sources, the nuclear safety and security interface, and some international governance issues.

Introduction of House Gifts and Gift Baskets

Leaders attending the first summit in Washington, DC were encouraged to bring *house gifts* to the event in the form of specific actions that their country would take, or had recently completed, to improve nuclear security. In 2010, 60 house gifts were offered, including pledges to ratify the nuclear security treaties, create new nuclear security centres of excellence and training, and

¹The review of the Nuclear Security Summit process is taken on the site of WINS Academy <http://winsacademy.org/mod/lesson/> accessible for duly registered and authorized persons.

contribute to the IAEA Nuclear Security Fund. By the 2012 summit in Seoul, more than 90% of the house gifts from 2010 had been fulfilled, and approximately 100 new national commitments were made.

National commitments on nuclear material removal and protection efforts have generated important global security achievements, including reducing the number of countries that possess weapons-usable nuclear materials from 32 in 2010 to 24 by the end of 2015. The value of this type of nuclear risk reduction work was demonstrated when conflict broke out in Ukraine over Crimea. Ukraine had completed its 2010 summit pledge to eliminate all HEU from its territory just one year before the conflict began. Without this proactive security measure, the instability in the country would have increased the risk that such material would be stolen or diverted.

National commitments also spurred States to take action to ratify relevant nuclear security treaties. Prior to the summit process, only 18 summit participants had ratified the 2005 Amendment to the Convention on the Protection of Nuclear Materials which, as noted earlier, sets protection requirements for the domestic use, storage and transport of nuclear materials as well as legal consequences for sabotage. Following the 2010 Summit, 26 participating countries acted on national commitments to ratify the Convention, and 17 participants completed ratification of the International Convention on the Suppression of Acts of Nuclear Terrorism.

Gift Basket Diplomacy

Gift basket diplomacy emerged from the 2012 NSS in Seoul as an extension of the national house-gift approach established at the Washington Summit. Such diplomacy involves groups of countries making multinational commitments by issuing joint statements describing their shared priorities, mutual goals, and the actions they plan to take in support of them. Any summit participant can initiate a gift basket, and there are no defined criteria for what it should accomplish. Gift baskets have been co-signed by as many as 35 countries and as few as three. Unlike the summit communiqués, which require consensus support and are meticulously refined by NSS participants months in advance, gift baskets are flexible tools that involve a degree of improvisation. The only requirement for offering a gift basket is to obtain the support of other countries since the multinational nature of a gift basket is its distinguishing characteristic.

This new form of commitment making captured much of the enthusiasm around summit outcomes in 2012 and 2014. From 2012 to 2014, State participation in gift basket diplomacy rose from approximately 80% to nearly 90%.

Thirteen gift baskets covering a wide range of issues were offered in 2012; these included nuclear information security, counter nuclear smuggling and educational outreach. Some groups of States used the gift basket tool to share information on the work they were doing in other forums that contributed to NSS goals, such as the joint statements issued by GICNT and the Global Partnership. Other statements expressed support and guidance on enhancing efforts around specific nuclear security issues, such as training and support centres, national legislation implementation and radioactive source security. A few statements were especially detailed about the set of activities its signatories would complete. Two important examples are the implementation of technical projects on low-enriched uranium (LEU) fuel production and the transitioning of medical isotope production from HEU to LEU.

Fourteen gift baskets were offered at the 2014 summit; more than half of these were updates to the multilateral commitments from the previous summit. These follow-on gift baskets often reported on the actions taken under their 2012 versions and pledged additional steps to be completed by the final summit in 2016. New gift basket topics introduced in 2014 included the security of the maritime supply chain, nuclear forensics, and supporting implementation of UNSCR 1540.

Reporting on Commitment Implementation

National progress reports, submitted voluntarily, provide the most detailed information that States publish about their implementation of commitments made at the summits. These reports were initiated after the 2010 NSS, but not without controversy. Countries originally rejected a reporting template that had been proposed at an early planning meeting for the 2012 summit; they also resisted the idea of having to report on non-binding political commitments made at these ad hoc summits. This tension over information sharing on national actions to strengthen nuclear security reflected the traditional view that confuses effective nuclear security with secrecy. Keeping truly sensitive information protected is critical, but overzealous confidentiality makes it

difficult to assess and identify areas in need of improvement, learn from other States, and fix vulnerabilities.

Despite early protests, more than 90% of the participants issued national progress reports at the 2012 and 2014 summits. The quality and structure of these reports varied, but the reporting process broke an important taboo about information sharing. Prior to the NSS, regular reporting on nuclear security was largely limited to submissions to the UNSCR 1540 Committee or a paragraph in national statements at IAEA General Conferences. In contrast, the NSS reports often comprise multiple pages and describe non-sensitive national and cooperative actions the State has pursued to strengthen nuclear security domestically and internationally.

A learning curve is visible in some of the countries' statements from 2012 to 2014; later versions demonstrate a clearer understanding of how national regimes intersect with the international nuclear security system. Every State has made at least one national commitment, and some have been prolific in their national and multinational commitment making, such as the three summit host countries, along with Canada, Japan, Kazakhstan, Norway, Philippines, Spain, and the United Kingdom.

INFCIRC/869

An important milestone in the summit process and multilateral commitment making was reached in October 2014. At this time, the **Strengthening Nuclear Security Implementation** (SNSI) initiative, a gift basket from The Hague summit, was introduced into the IAEA as an Information Circular (INFCIRC/869). Because it is an INFCIRC, any State can join the initiative—whether or not it participated in a summit. Thirty-five States signed the SNSI at the 2014 summit, making it one of the two most popular gift baskets to date. In November 2015, Jordan became the first country to use the INFCIRC process to issue its support. As an INFCIRC, the initiative will outlive the summit process and could grow to provide a platform for further nuclear security progress.

INFCIRC/869 is also unique for its content. Sponsored by the three summit hosts, it commits States to subscribe to the IAEA's Fundamentals of Nuclear Security and meet the intent of recommendations contained in the IAEA Nuclear Security Series documents and Codes of Conduct. Signatories pledge to continually improve their nuclear security regimes through self-

assessments and peer reviews; they also pledge to ensure that the management and personnel responsible for nuclear security are *demonstrably competent*. In addition, the initiative includes a non-exhaustive list of a dozen actions that States can take to “contribute to the continuous improvement of nuclear security”, including supporting the activities of the World Institute for Nuclear Security.

INFCIRC/869 begins to address weaknesses in the international nuclear security regime in a way that no other summit outcome has done. It has important norm-building implications because it commits States to reflect some important IAEA recommendations in their national regimes, which consequently gives these recommendations a status much closer to the force of law. At a press conference following the 2014 summit, US Secretary of Energy Ernest Moniz described this as creating “the closest thing we have to international standards” for nuclear security. If INFCIRC/869 can continue to grow and evolve, it offers a potential structure for States to move the nuclear security mission forward after the summits.

The Final Summit in 2016

Leaders and representatives of 52 countries and four regional and international organisations attended the final summit. It produced 13 additional gift baskets (although many built upon previous commitments), five action plans for existing international bodies, new national and multilateral commitments, a contact group to oversee the implementation of commitments made, and a final communiqué. Three of the gift baskets were particularly notable:

Insider threat mitigation: Twenty-seven States signed the gift basket on insider threat mitigation, committing themselves to establishing and implementing measures on a national level to mitigate threats from insiders.

Cybersecurity: Twenty-nine States signed the gift basket on cybersecurity for industrial control and plant systems at nuclear facilities. These signatories agreed to participate in two international workshops to facilitate sharing of best practices and review the impact of information technology.

HEU usage: Twenty-two States signed the gift basket on minimizing and eliminating the use of HEU in civilian applications. An international conference in 2018 will review the progress made by signatories on HEU reactor

conversion or shut-down; HEU stock removal, down-blending or disposition; and the development of LEU alternatives.

Additionally, China, India and Japan took significant national steps. China and India agreed to sign onto INFCIRC/869, and China reported that it had established its first Centre of Excellence on Nuclear Security and converted an HEU research reactor to use LEU. Japan reported that it had completed the removal of HEU and separated plutonium fuels from its Fast Critical Assembly, which represents the largest single nuclear material removal in the NSS process. Japan also committed to removing all HEU fuel from the Kyoto University Critical Assembly.

The United States took a number of unilateral actions. It declassified its inventory of HEU as a transparency measure and released a statement describing the measures it has put in place to secure nuclear materials used for military purposes. The United States also released a statement on the directions it had given the US Navy and Department of Energy to consider developing LEU fuel for use in naval reactors.

Another important development occurred when the IAEA Director General Yukiya Amano announced that the Amendment to the Convention on the Physical Protection of Nuclear Materials was set to enter into force 11 years after its initial adoption. Amano said he would bring States “together to work out ways of improving the mechanisms for sharing information”, including that on sabotage and credible threats of sabotage. To promote comprehensive implementation of the amendment and convention, Amano also discussed his plan to host annual meetings of national points of contact for the convention, as well as periodic review conferences.

One other important issue that was addressed at the 2016 summit was how to maintain political momentum from the summit process in the future. There was considerable debate among the States attending the summits, as well as among the wider civil society (including the NGO communities), about how this could be accomplished and whether the IAEA had sufficient authority and energy to drive the agenda forward.

In the end, the summit produced five action plans:

The IAEA action plan called for the organisation to hold ministerial meetings on nuclear security, take a stronger lead on coordination between States and international bodies, and promote the minimisation of HEU usage.

The United Nations action plan focused heavily on deepening implementation of UN Security Council Resolution 1540 and the International Convention for the Suppression of Acts of Nuclear Terrorism.

The INTERPOL action plan focused on increasing INTERPOL's role in improving States' information-sharing capabilities, enhancing the systems that track and alert States about individuals involved in nuclear and radioactive material trafficking, and expanding development of best practice guidelines, training and courses.

The Global Initiative to Combat Nuclear Terrorism action plan emphasised augmenting the technical capacity of GICNT partner States and conducting scenario-based discussions, as well as table-top and field exercises.

The Global Partnership against the Spread of Weapons and Materials of Mass Destruction action plan directed the partnership to provide broader assistance to States for coordinating programmes and activities and to strengthen its role in UNSCR 1540 implementation by working with the 1540 Group of Experts to match resources with funding requests.

Additionally, a Nuclear Security Contact Group was created. This group will consist of senior expert officials from summit States and from States outside the NSS process. The group will meet on a regular basis to "synchronize efforts to implement commitments" made during the NSS process.

Legacy of the Nuclear Security Summits

During the six-year summit process, the summits exerted much needed political pressure on States to propose and complete actions to enhance nuclear security. The system of gift baskets, which has now also been used effectively at political meetings on climate change, made a significant contribution to the effort because it allowed groups of States to show leadership rather than relying on consensus decision-making.

The tangible actions taken to remove HEU from some countries and secure radioactive sources are important, as was the political momentum that encouraged enough States to commit to the Amended CPPNM that it entered into force on 8 May 2016. It is highly unlikely that this would have happened without the summit process. The introduction of INFCIRC/869 was also a major development in the quest for international standards for nuclear security. Taken as a whole, the Nuclear Security Summits should be viewed

as a very productive and much needed contribution to enhancing the security of nuclear and other radioactive materials.

Some commentators remain sceptical, however, about the progress and note that the nuclear security regime remains a patchwork of treaty commitments, bilateral and multilateral initiatives, and informal rules with far too many holes. They point to the fact that no single treaty or initiative covers all aspects of nuclear security, few countries have signed on to all of them, and many are too vague and lack sufficient transparency to allow anyone to judge whether governments are providing adequate protection.

Some commentators also believe that the summits have done little to address such important areas as the vast majority of fissile materials that are not in civil use (most of which is not in weapons, but in such forms as fuel for naval submarines); growing civil stocks of separated plutonium; the sabotage of nuclear facilities; cyber threats to nuclear security; and the security of readily accessible, high-risk radioactive sources that could be used in dirty bombs or other radiological weapons. The lack of universal participation in the process—most notably Russia's decision not to attend the 2016 summit—has further contributed, some believe, to the failure to reach US President Obama's goal of securing all vulnerable materials.

In December 2016, eight months after the last NSS, the IAEA plans to convene the next Ministerial Nuclear Security Conference in Vienna. This event, which is held every three years, draws government officials, regulators, technical specialists and some non-governmental experts together from around the world. Such conferences may become the highest-level, regular gatherings on nuclear security and could provide an opportunity for States to meet to discuss priorities and continue the tradition of commitment making. However, some observers are concerned that the political momentum of the summits will quickly erode and that the IAEA will be unable or unwilling to exert the same pressure on States to make and implement improvements to nuclear security.

The Nuclear Industry Summits (NIS)

The same time that the Nuclear Security Summits were taking place, leaders of industry also took part in official side events called the *Nuclear Industry Summits*. The purpose of the NIS was to give leaders the opportunity to discuss the contributions industry could make to enhancing nuclear security.

These summits became more organised on each occasion and led the nuclear industry to publish its own Joint Statements. To date, however, no specific work plans or gift baskets have been produced that mirror the contributions States have made through the Nuclear Security Summits.

There are also important differences in the way that the NSS and NIS were organised. Each country attending the NSS appointed a senior official (known as a Sherpa) to represent their government, supported by other officials from a range of government departments to help ensure that the commitments and statements were properly coordinated and owned by the respective government departments. The Sherpas met every few months to discuss progress, consider gift baskets and draft text.

By contrast, the NIS appointed a steering committee chaired by a senior executive from the country hosting the NSS. Additional committees were then appointed to help produce working group reports and recommendations. The principal committees were the Advisory Committee (also called the Board of International Advisors) and the Organising Committee, which was responsible for event logistics. Compared to the NSS Sherpa meetings, the NIS Advisory Committees and their Working Groups met far less frequently and were attended by relatively few representatives from industry. Furthermore, effective engagement with the wider nuclear industry proved challenging, and it was also challenging to obtain their feedback.

Accordingly, the working group reports and final statements made by the NIS after each summit have largely been inspirational. They lack formal commitments on the part of industry to take further actions, as well as a mechanism with which to verify that action has occurred. For these reasons, the NIS events have been less effective than would have been the case had there been widespread industry support for the process. Some industry representatives continue to believe that nuclear security is a matter for the State and that their role is to simply comply with national regulatory requirements. Others have fully engaged with the NIS process and understand the valuable and essential role that industry must play in the international and national nuclear security regimes.

Senior industry representatives from more proactive organisations are currently considering how to take forward their international engagement on nuclear security issues and achieve more effective and organised industry representation at the IAEA and other relevant forums. The Joint Statement from the 2016 Nuclear Industry Summit is provided below. It highlights the

areas that industry representatives considered to be important despite the lack of formal commitments to take action.

Joint Statement of the 2016 Nuclear Industry Summit

The 2016 Nuclear Industry Summit convened in Washington on March 30, 2016, as an official side event of the 2016 Nuclear Security Summit. It was attended by 350 leaders from the global nuclear industry with significant experience and responsibility for the operation of nuclear installations, production and management of nuclear materials, and for international nuclear cooperation and trade.

Nuclear technology and materials provide a vital contribution to modern society, as do the radiological sources through their application in industry, medicine, agriculture, research and other fields. Nuclear power currently provides 12% of the world's electricity and has one of the smallest carbon footprints of any major energy source. Tens of millions of patients are treated with nuclear medicine each year and 90% of these support clinical diagnosis; there are over a 100 different nuclear imaging procedures in use at the thousands of medical centers that use nuclear medicine for the benefit of human health.

Continued public confidence is essential for the application of nuclear technology and the extensive benefits that it brings. NIS participants commit to enhance public and stakeholder confidence through high standards of transparency, integrity, ethical behavior and social responsibility.

The participants acknowledge their individual responsibilities for implementing effective security arrangements within national regulatory frameworks and reaffirm their commitment to work together in a cooperative manner, and with respective States' authorities, to continuously improve security as well as safety performance. The nuclear industry has already worked actively over many years to improve all aspects of their nuclear security arrangements, including physical protection, material accountancy, the risk from trusted insiders, and security culture.

While reaffirming the commitments made in the previous Nuclear Industry Summits, the participants will undertake the following elements to further enhance nuclear security by:

1. Effectively securing all nuclear and radiological materials in industrial facilities and applications, at a minimum by complying with national regulations, taking into account IAEA guidelines and relevant best practices.

2. Continuously improving nuclear security practices by:

A. Participating in regular International Atomic Energy Agency (IAEA) International Physical Protection Advisory Service (IPPAS) peer reviews as requested by States and relevant best practice exchanges while duly taking into account the obligation of protection of sensitive information; In the domain of international reviews, industry notes that the IAEA International Physical Protection Advisory Service (IPPAS) missions now include a new module on

cybersecurity. Industry considers that it is an important development for IPPAS to develop a common understanding of security and cybersecurity review dedicated and specialized to nuclear activities;

B. Non-governmental entities, including World Nuclear Association (WNA), universities and World Institute for Nuclear Security (WINS) could also play a role in exchanging non-sensitive relevant best practices and non-sensitive general training in the field of security. This could be especially useful to new entrants to the industry;

C. Implementing robust training programs for security personnel, including performance-based testing and force-on-force exercises, as required by national regulation;

D. Ensuring that management and personnel with responsibility for nuclear security are demonstrably competent, including through national or international training programs;

E. Regularly reviewing security plans and adapting security measures so that they address emerging threats in line with national Design Basis Threat assessments;

F. Recognizing the importance of the nuclear security/safety interface, and ensuring that nuclear safety and nuclear security measures are designed and managed in a coherent and coordinated manner. Recognizing the role for WANO, which while conducting reviews on nuclear safety, should take into account the implications of its recommendations on nuclear security;

G. Recognizing that the nuclear industry has to work with the national requirements, including those of relevant nuclear security authority and/or national specific security agency. We understand that these national authorities develop national standards and national review/inspection process dedicated and specialized to nuclear industry. The nuclear industry pledges to work for the implementation of the requirements.

3. Enhancing public and stakeholder confidence in the effectiveness of security practices and the sustainability of safe, secure and reliable nuclear energy by (if permitted), e.g., publishing periodic reports with an appropriate level of information and reaffirming a commitment to continuously improve security.

4. Enhancing security culture for management and personnel with accountability for nuclear security by:

A. Raising awareness among employees to nuclear security threats;

B. Fostering an open environment for reporting security concerns;

C. Providing workplace incentives for nuclear security excellence and ensuring oversight and accountability;

D. Encouraging employees to report suspicious behavior and/or events through appropriate channels;

E. Enhancing security culture by promoting, nuclear safety and security culture through regional and international cooperation.

5. Improving the state of cybersecurity across all nuclear facilities and applications by:

A. Collaborating with national and international organizations and other members of industry to develop and exchange non sensitive relevant best practices for cybersecurity at nuclear facilities, including supporting a potential international governmental-based forum or process for voluntary exchange of information and coordination to prevent, detect and respond to cybersecurity incidents; while duly taking into account the obligation for the protection of sensitive information;

B. Considering ways to move beyond traditional security solutions and develop more effective technological approaches to cybersecurity;

C. Participating in IAEA, and other cybersecurity workshops, training, and conferences to develop awareness and technical capacity among IT, engineering, and safety/security personnel;

D. Encouraging governments to host IAEA IPPAS reviews that include a cybersecurity module;

E. Working with vendors to minimize vulnerabilities in the technology supply chain through, in certain cases, appropriate incentives.

6. Supporting efforts to strengthen the global nuclear security architecture and sustaining the high-level attention brought to nuclear security by industry leaders by:

A. Establishing a process leading to continued exchange in industry forum dedicated to the advancement of nuclear security beyond the 2016 Nuclear Industry Summit, including but not limited to cybersecurity, based on experienced feedback of the current NIS process shared by representatives members of the nuclear industry;

B. Continuing to meet on a regular basis to exchange nuclear security non-sensitive relevant best practices and discuss emerging nuclear security challenges.

7. Enhancing the state of radiological security worldwide by:

A. Converting applications using high-activity radioactive sources, where technically and economically feasible to alternatives technologies;

B. Effectively securing high-activity radioactive sources in accordance with national regulations and taking into account IAEA guidelines.

8. We recognize that highly enriched uranium (HEU) and separated plutonium require special precautions and that it is of great importance that they are appropriately secured, consolidated and accounted for. Over the past years, industry has made considerable progress in safe, secure and timely consolidation inside countries and in removal to other countries for disposal. Furthermore, a considerable amount of HEU has been down-blended to low-enriched uranium (LEU) and separated plutonium converted to mixed oxide (MOX) fuel. We are encouraged by States to continue to minimize stocks of HEU and to keep stockpiles of separated plutonium to the minimum level, both as consistent with national requirements. We are encouraged by States to continue to minimize the use of HEU through the conversion of reactor fuel from HEU to LEU, where technically and economically feasible, and in this regard welcome cooperation on technologies facilitating such conversion. Similarly, we will continue to encourage and support efforts to use non-HEU technologies for the production of radioisotopes, including financial incentives, taking into account the need for an assured and reliable supply of medical isotopes.

WASHINGTON, MARCH 30, 2016

The Nuclear Knowledge Summits (NKS)

In common with the nuclear industry, the international NGO community also organised its own events concurrently with the official NSS. The majority of NGOs that are engaged with nuclear security issues are based in the United States or funded by US foundations. Examples of some of the most active NGOs include:

- The Stanley Foundation
- The MacArthur Foundation
- The Stimson Center
- Carnegie New York
- The Nuclear Threat Initiative
- The Asan Institute for Policy Studies
- The Partnership for Global Security
- Harvard University Belfer Center
- The Fissile Materials Working Group

Collectively, these stakeholders produce a wealth of high quality research reports and policy proposals and their websites are highly recommended. There are also two publications that regularly feature current issues associated with nuclear security: *The Bulletin of the Atomic Scientists* and *Arms Control Today*.

NGOs tend to focus on three major areas: improving regime cohesion, promoting greater transparency, and building international confidence.