NUCLEAR SECURITY SUMMITS: JOURNEY SO FAR AND WHAT NEXT?

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Global efforts like the Nuclear Security Summit (NSS), an "action-forcing event"[1] for building an effective and sustainable nuclear security regime, have significantly sensitised nations on safe-keeping of nuclear technology and materials, with many tangible steps. Still, there remain many unfinished challenging works; uncertainties about what path should be taken beyond the Summits to maintain the global momentum generated so far to defend against nuclear terrorism.

Before dwelling on such issues, one may contemplate the rationale behind the NSS initiative: what objective it achieved, and why the Summit process concluded. At the outset, the concern for nuclear safety and security is as old as nuclear technology itself. Safe-keep of nuclear materials, nuclear warheads, and nuclear knowhow was of utmost importance during the Cold War, mainly to avoid the chances of inadvertent use, espionage, surprise attack, etc. It was mainly an issue of security threats from a state adversary. But the emergence of the fear of nuclear terrorism *per se* can be traced back to the 1970s when Larry Collins and Dominique Lapierre wrote the thriller *The Fifth Horseman,* narrating Libya's Muammar Gaddafi's attempt to force the US to support the Palestinian cause by threatening to blow up New York city

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1. Gary Samore, quoted in William Tobey, "Peering Down from the Summit: The Path to Nuclear Security 2010–2016 and Beyond", http://globalsummitry.oxfordjournals.org/content/globalsummitry/early/2016/10/01/global.guw011.full.pdf, p. 7.

With the unfolding of the AQ Khan proliferation network, and emergence of Al Qaeda and splintering *jihadi* groups of transnational spread, a nuclear terror event was perceived as a reality. For that matter, 9/11 proved the non-state actors' capability and resolve.

with nuclear weapons. As a result, the French president was known to have cancelled his plan to sell nuclear reactors to Libya, and Paramount Pictures dropped its idea to make a movie based on the novel for fear that fanatics "may try to emulate the scenario that would unfold in the film."[2]

With the disintegration of the USSR and sporadic incidents of terrorist/extremist organisations' involvement in nuclear materials smuggling, the thriller stories of a nuclear holocaust during the 1970s and 1980s seemed more likely during the 1990s. With the unfolding of the AQ Khan proliferation network, and emergence of Al Qaeda and splintering *jihadi* groups of transnational spread, a nuclear terror event was perceived as a reality. For that matter, 9/11 proved the non-state actors' capability and resolve. Unexpectedly, in January 2007, four former US Cold War strategists – George P. Shultz, William J. Perry, Henry A. Kissinger and Sam Nunn – who were the votaries of nuclear deterrence, came out with a unanimous argument in the *Wall Street Journal* saying:

> …the world is now on the precipice of a new and dangerous nuclear era. Most alarmingly, the likelihood that non-state terrorists will get their hands on nuclear weaponry is increasing. In today's war waged on world order by terrorists, nuclear weapons are the ultimate means of mass devastation. And non-state terrorist groups with nuclear weapons are conceptually outside the bounds of a deterrent strategy and present difficult new security challenges.[3]

2. "Lapierre's Prediction of a Terrorist Attack on New York", http://www.the-south-asian.com/dec2001/lapierre_2.htm
3. George P. Shultz, William J. Perry, Henry A. Kissinger and Sam Nunn, "A World Free of Nuclear Weapons", http://www.wsj.com/articles/SB116787515251566636, January 4, 2007.

Vindicating a shift in the offing in the global nuclear discourse since the end of the Cold War, the four Cold Warriors asserted, "Nuclear weapons today present tremendous dangers, but also an historic opportunity. US leadership will be required to take the world to the next stage — to a solid consensus for reversing reliance on nuclear weapons globally as a vital contribution to preventing their proliferation into potentially dangerous hands...."[4] As the complete nuclear disarmament "goal cannot be reached quickly – perhaps not in my lifetime", as said by Obama in his 2009 Prague speech, a commitment for "a new international effort to secure all vulnerable nuclear material around the world" within the framework of an international effort, the Nuclear Security Summit,[5] was most pragmatic.

At the end of the four summits, there are confronting arguments on the intended objectives of the NSS and the degree of achievements thereof. Many point out the inability of the summit process to address the security of military assets, and the issue of nuclear disarmament that the summit did not touch upon.

Though initially, Obama, at Prague (April 5, 2009), had set the target "to secure all vulnerable nuclear material around the world within four years" through two summits, two more summits were organised subsequently, the fourth and last being the Washington Summit in 2016. At the end of the four summits, there are confronting arguments on the intended objectives of the NSS and the degree of achievements thereof. Many point out the inability of the summit process to address the security of military assets, and the issue of nuclear disarmament that the summit did not touch upon.

It is generally perceived that the most vulnerable nuclear material is the Highly Enriched Uranium (HEU) weapon grade materials, stored or used in different countries in the civilian sector, which are prone to misuse or

4. Ibid.
5. "Remarks by President Barack Obama", https://www.whitehouse.gov/the-press-office/remarks-president-barack-obama-prague-delivered, April 5, 2009. Also at the bilateral level, in April 2010, US President Obama and Russian President Medvedev signed the New START Treaty to reduce the number of strategic nuclear weapons and decrease the probability that such weapons or their constituent materials could be acquired by terrorists.

smuggling,[6] whereas the military assets are relatively better guarded and secured in the respective countries. Therefore, the NSS process, from the very beginning, zeroed upon the task of securing the vulnerable materials. According to the Arms Control Association, "The broad goal of the summit process is to address the threat of nuclear terrorism by minimizing and securing weapons-usable nuclear materials, enhancing international cooperation to prevent the illicit acquisition of nuclear material by non-state actors such as terrorist groups and smugglers, and taking steps to strengthen the global nuclear security system."[7]

THE FOUR SUMMITS

One may wonder what objectives the four Summits have achieved, and more importantly, why the summit process has been stopped here. First, probably in pursuit of his responsibility as the Noble Peace Prize recipient, Obama had to adopt a new approach to secure the world from the scourge of nuclear weapons, separate from the traditional approach of nuclear disarmament. Second, Obama could steer, at the maximum, four summits within his two tenures as US president. Post-Obama, nuclear security will certainly remain a priority for subsequent US Administrations, but it may not be in the Obama way.

The four summits that spanned Obama's presidency undoubtedly elevated the issue of nuclear security to the level of a global leaders' summit and laid down the foundation for a sustainable nuclear security regime, almost at par with the nuclear safety regime. More importantly, the summit initiative believes that "any unsecured nuclear material is a threat everywhere"; but, "there aren't any mandatory international standards for securing all nuclear materials".[8] Therefore, in the first summit at Washington DC in 2010, all 47 participating countries welcomed and joined "President

6. Over 2,000 tonnes of plutonium and HEU existed in dozens of countries for a variety of peaceful as well as military uses. There have been 18 documented cases of theft or loss of highly enriched uranium or plutonium , and perhaps others, not yet discovered.
7. "Nuclear Security Summit at a Glance", http://www.armscontrol.org/factsheets/NuclearSecuritySummit
8. "Five Points on the Importance of the Nuclear Security Summit", http://talkingpointsmemo.com/fivepoints/five-points-importance-nuclear-security-summit

Obama's call to secure all vulnerable nuclear material in four years",[9] and called for "focussed national efforts to improve security and accounting of nuclear materials and strengthen regulations…."[10] It brought together the highest authorities of states and secured their commitment for a "Work Plan consistent with respective national laws and international obligations, in all aspects of the storage, use, transportation and disposal of nuclear materials and in preventing non-state actors from obtaining the information required to use such material for malicious purposes."[11]

The 2010 NSS Work Plan basically aimed at universalising the multilateral instruments like the International Convention for Suppression of Acts of Nuclear Terrorism (ICSANT), Convention on Physical Protection of Nuclear Material (CPPNM) and the 2005 Amendment to the Convention, United Nations Security Council Resolution (UNSCR) 1540 (2004) on preventing non-state actors from obtaining Weapons of Mass Destruction (WMD), and UNSCR 1373. The Work Plan also reiterated the role of the International Atomic Energy Agency (IAEA) and its "Information Circular (INFCIRC) 225 which provides guidance and recommendations for developing and implementing physical protection of nuclear materials and facilities",[12] support of national efforts to enhance nuclear security worldwide through its Nuclear Security Plan for 2010-13, Nuclear Security Guidelines, International Physical Protection Advisory Services (IPPAS), etc.

While noting the fundamental responsibility of states for safe-keeping of all nuclear materials and facilities under their jurisdiction, the Summit recognised the inherent rights of states to develop and use nuclear energy for peaceful purposes. For this, the Summit exhorted all states to build a robust domestic regulatory capacity and set better standards for the nuclear industry, including the private sector, for nurturing a better 'nuclear security culture'. The Summit

9. Communiqué of the Washington Nuclear Security Summit, http://www.state.gov/documents/organization/237037.pdf, April 13, 2010.
10. "Key Facts about the Nuclear Security Summit", http://www.state.gov/documents/organization/247156.pdf
11. "Work Plan of the Washington Nuclear Security Summit", https://www.whitehouse.gov/the-press-office/work-plan-washington-nuclear-security-summit
12. "Nuclear Security Work Plan Reference Document", https://www.whitehouse.gov/the-press-office/nuclear-security-work-plan-reference-document, April 13, 2010.

envisaged greater cooperation among states to detect, prevent, suppress, investigate, and prosecute acts of illicit nuclear trafficking through exchange of information and advanced scientific techniques like nuclear forensics, etc.

The **Seoul Summit 2012**, attended by 58 delegates from 53 nations and four international organisations (EU, UN, IAEA, and Interpol), was an important evolution over the first summit, primarily because it expanded the scope of nuclear security to include "radiological source security and the interface between nuclear safety and security."[13] This is largely attributed to the Fukushima reactor accident which demonstrated that a nuclear disaster can occur in an extremely technologically advanced country. Moreover, there was broad understanding about the transnational implications of an unauthorised release of radiation and the inability of the international system to adequately address the implications. Lastly, the participating states offered new voluntary commitments known as 'house gifts' or 'gift baskets' on issues where consensus is not required.

The gift basket option was developed precisely because many countries wanted to move at their own pace on ambitious visions. "They were created as a means to encourage countries to do more than the political consensus process" on areas ranging from HEU minimisation, separated plutonium repatriation, domestic regulatory frameworks to building centres of excellence for multilateral cooperation, etc.[14] More than 30 countries participated in fourteen gift basket diplomacy statements at the 2012 Nuclear Security Summit in Seoul. During subsequent summits, more gifts in different issues areas were advanced by many members.[15]

In addition, the 2012 Seoul Communique,[16] based on the objectives set out in the 2010 Washington Communiqué and 'Work Plan',[17] identified 11

13. Kenneth N. Luongo, "Nuclear Security Governance for 21st Century: An Action Plan for Progress", http://www.nsgeg.org/Nuclear%20Security%20Governance%20for%20the%20 21st%20Century%20-%20Ken%20Luongo.pdf, p. 2.
14. Kenneth N. Luongo, Michelle Cann, "Nuclear Security: Seoul, the Netherlands, and Beyond", http://uskoreainstitute.org/wp-content/uploads/2013/10/USKI-NSS-Report_Full.pdf, p. 17.
15. "2014 Gift Baskets", http://www.nss2016.org/2014/giftbaskets/; "2016 Gift Baskets", http://www.nss2016.org/2016-gift-baskets/
16. "Seoul Communiqué: 2012 Seoul Nuclear Security Summit", http://www.state.gov/documents/organization/236996.pdf
17. "Work Plan of the Washington Nuclear Security Summit", http://www.state.gov/documents/organization/237041.pdf

areas of priority and presented specific actions in each area. These include building of a global nuclear security architecture, reaffirmation of the central role of the IAEA, encouraging states for safe, secure and timely removal and disposition of unused nuclear materials from facilities, safe-keep of radioactive sources used in various sectors, strengthening transportation security, combating illicit trafficking, nuclear forensics, building a nuclear security culture, information security, and international cooperation. The communiqué reaffirmed the states' "voluntary and substantive efforts toward strengthening nuclear security and implementing political commitments made in this regard",[18] resulting in over 100 new commitments made at the 2012 Summit.[19]

In the **2014 NSS in The Hague,** substantial achievements were discernible from the pledge in the Joint Statements issued by 35 participating nations.[20] Participant countries pledged to work closer together and submit to "peer reviews periodically" their sensitive nuclear security systems; nations, including Israel, Kazakhstan, Morocco and Turkey, but not Russia, vowed to "realise or exceed" the standards set out in a series of guidelines laid down by the IAEA to safeguard nuclear materials; contribute to developing IAEA nuclear security guidance documents; and provide technical support and assistance to other states.[21]

Additionally, member states were to cooperate in areas relating to cyber security emergency response and mitigation capabilities, financial contributions to the Nuclear Security Fund, promotion of R&D on nuclear security technologies, promotion of a 'nuclear security culture', participation in developing the World Institute for Nuclear Security training activities, and cooperation with neighbouring states to improve international and regional nuclear security.[22] "Besides, 23 participating nations stated their

18. n. 16, p. 6.
19. "The Seoul Nuclear Security Summit Preparatory Secretariat", http://www.state.gov/documents/organization/237130.pdf
20. "2014 Joint Statements", http://www.nss2016.org/2014/jointstatements
21. "Third Nuclear Summit Ends with 35-Nation Pledge on Nuclear Security", *The Express Tribune*, http://tribune.com.pk/story/687349/third-nuclear-summit-ends-with-35-nation-pledge-on-nuclear-security/, March 26, 2014.
22. PR Chari, "The Hague Nuclear Security Summit: Evaluating Major Achievements", http://www.ipcs.org/print_article-details.php?recNo=4393, Article No. #4357, March 28, 2014.

The 2016 Summit was also known as a "transition summit" to plan how to sustain the nuclear security momentum, NSS vision and agenda beyond the summit level. In 2016, the participants made nearly 90 additional national commitments, besides the additional actions in the 2016 gift baskets and joint statements.

intentions at the summit meeting to comply with international guidelines regarding the security of the most lethal Category I radiological sources contained in the IAEA's Code of Conduct on the Safety and Security of Radioactive Sources."[23] With Japan's leadership, five countries—France, South Korea, the United Kingdom and the United States—signed onto another gift basket relating to transport security for nuclear and radiological materials by forming a working group.[24]

The fourth and last **summit at Washington DC in 2016** reiterated "the threat of nuclear and radiological terrorism that remains, and evolving, as one of the greatest challenges to international security." Therefore, the participant countries pledged "to continue to make nuclear security an enduring priority".[25] The 2016 Summit was also known as a "transition summit" to plan how to sustain the nuclear security momentum, NSS vision and agenda beyond the summit level. In 2016, the participants made nearly 90 additional national commitments, besides the additional actions in the 2016 gift baskets and joint statements.

For sustaining the momentum and political attention generated on nuclear security as a global priority, the 2016 Summit provided three means:[26] (1) the Nuclear Security Contact Group, created as a mechanism by which senior officials routinely consult and synchronise national actions. The group will

23. Ibid.
24. Douglas P. Guarino, "Nations Pledge to Follow Security Guidelines for 'Dirty Bomb' Material", http://www.nti.org/gsn/article/nations-pledge-follow-security-guidelines-dirty-bomb-material/, March 26, 2014.
25. "Nuclear Security Summit 2016 Communiqué", https://www.whitehouse.gov/the-press-office/2016/04/01/nuclear-security-summit-2016-communiqu%C3%A9
26. Samantha Pitts-Kiefer, "2016 Nuclear Security Summit Progress Report: Building and Sustaining an Effective Global System", http://www.nti.org/analysis/articles/2016-nuclear-security-summit-progress-report/, April 25, 2016.

meet annually, maintaining the network of senior officials and experts.[27] Thirty-nine participants, in addition to the UN and INTERPOL, have indicated their intent to participate in the group. (2) A number of Action Plans were prepared in support of the UN, IAEA, INTERPOL, GCINT, and the Global Partnership against the Spread of Weapons and Materials of Mass Destruction. In addition, a number of joint statements were made on crucial issues like countering nuclear smuggling, cyber security, forensics, maritime supply chain security, national nuclear detection architecture, security of high activity radioactive sources, certified training for nuclear security management, etc. (3) The CPPNM was identified as the institutional mechanism for continuing the dialogue in the long-term.

The nuclear security regime is often viewed as not well-defined or not matured, unlike the nuclear safety regime. The NSS process has undoubtedly addressed this by laying down the foundation for a stronger and more comprehensive nuclear security regime.

In addition, the 2016 Communiqué has also reaffirmed the commitment on the "shared goals of nuclear disarmament, nuclear non-proliferation and peaceful use of nuclear energy" while underlining the imperative of "more work remains to be done to prevent non-state actors from obtaining nuclear and other radioactive materials."[28] All this essentially vindicates the commitment and resolve of the comity of nations, though limited, to carry forward the momentum generated regarding the safe-keep of nuclear material and technology.

THE TANGIBLE OUTCOMES

The summit process made "some serious progress" in many important areas.[29] The nuclear security regime is often viewed as not well-defined

27. "Fact Sheet: Joint Statement on Sustaining Action to Strengthen Global Nuclear Security Architecture", April 6, 2016, http://www.nss2016.org/document-center-docs/2016/4/4/fact-sheet-joint-statement-on-sustaining-action-to-strengthen-global-nuclear-security-architecture
28. "Nuclear Security Summit 2016 Communiqué", https://static1.squarespace.com/static/568be36505f8e2af8023adf7/t/56fef01a2eeb810fd917abb9/1459548186895/Communiqu%C3%A9.pdf, April 1, 2016.
29. Mathew Bunn, "The Nuclear Security Summit: Wins, Losses, and Draws", http://thebulletin.org/nuclear-security-summit-wins-losses-and-draws9310, April 8, 2016.

or not matured, unlike the nuclear safety regime. The NSS process has undoubtedly addressed this by laying down the foundation for a stronger and more comprehensive nuclear security regime, almost at par with the nuclear security regime. In addition, each summit has seen an increasing number of participants and voluntary contributions by individual, and groups of, countries in the pursuit of enhancing nuclear security. A snapshot of the progress achieved by 2016 can be obtained from the NSS 2016 official website where it highlights that:

> Over 40 Summit countries have engaged in capacity building....Over 30 countries have updated national laws, regulations, or structures relating to nuclear security. Over 20 countries have held or invited peer review missions.... China, India, and Jordan have pledged to strengthen nuclear security implementation through subscribing to the 2014 Joint Statement on Strengthening Nuclear Security Implementation (INFCIRC 869), bringing the total number to 38. Eighteen countries have taken steps to increase the security of radioactive sources. Seventeen countries have been involved in removal or disposal of nuclear materials, or minimization of HEU. Sixteen countries have ratified nuclear security treaties or taken particular steps to implement them. Fifteen countries have carried out physical security upgrades or acquired security or detection equipment. A dozen countries have joined or launched new international or regional structures to support nuclear security cooperation. Twelve countries have indicated their financial contributions.... And 10 countries noted steps taken to support or implement UNSC Resolution 1540.[30]

The Fact Sheet of the NSS, dated April 6, 2016, elaborates on such progress and the success achieved since the beginning of the NSS process, which can be categorised under the following heads.[31]

30. "Highlights of National Progress Reports, March 31– April 1, 2016", http://www.nss2016.org/news/2016/4/5/highlights-from-national-progress-reports-nuclear-security-summit, April 5, 2016.
31. "Fact Sheet: The Nuclear Security Summits: Securing the World from Nuclear Terrorism", http://www.nss2016.org/document-center-docs/2016/3/31/fact-sheet-the-nuclear-security-summits-securing-the-world-from-nuclear-terrorism

- **Collective of Leaders:** The Nuclear Security Summit has managed to garner leaders' unity and attention across the globe. As an offshoot of the NSS process, more than 60 world leaders who joined hands at the four summits have been working together on the single agenda of preventing nuclear terrorism through the safe-keep of nuclear material. The collectivity among various governments, national leaders, civil society organisations, etc. shown during the last one decade for strengthening the nuclear security governance structure, is unprecedented. As nuclear security remains the exclusive domain of national governments, personal commitments by, and attention from, national leaders is most desirable. This newfound collectivity will help to arrive at universal commitments and, at the same time, single out and gang up against nations having a nexus with non-state actors or that are feared to have joined hands with them.
- **National Commitments and Actions:** Collectively, the participants of the NSS have made many national commitments of which many have already been implemented. During the course of the four summits, national commitments have increased in scope, and expanded from the commitments offered at the first summit in April 2010 to the multinational commitments offered in 2012, 2014, and 2016. The "house gifts" and "gift baskets," are responsible for the "most notable outcomes of the NSS process and have helped improve the security of nuclear and radiological materials and facilities globally".[32]

  National commitments are not legally—but politically—binding, as they are pronounced generally by the leaders and senior officials of the concerned countries'. In 2010, around 60 house gifts were offered, including pledges to ratify the nuclear security treaties, create new nuclear security centres of excellence and training initiatives, and contribute to the IAEA Nuclear Security Fund. By the 2012 Seoul Summit, more than 90 percent of the house gifts from 2010 had been fulfilled,

32. Michelle Cann, Kelsey Davenport, and Jenna Parker, "The Nuclear Security Summit: Accomplishments of the Process", https://pgstest.files.wordpress.com/2016/03/nss-report-final.pdf

and approximately 100 new national commitments were made. Around 100 national commitments and 13 joint statements were offered in Seoul alone, including commitments on nuclear material removal, reactor and isotope production conversion research projects, and capacity building exercises and training.[33] Forty-nine countries made Joint Statement commitments on various aspects during The Hague Summit 2014.[34]

On the occasion of the 2016 Washington Nuclear Security Summit, the state parties reaffirmed their commitment to improving further the national detection architectures with the goal to combat illicit trafficking and prevent malicious acts. All the states committed themselves to efficient use of available nuclear detection resources. They further reaffirmed their commitment to the IAEA's recommendations, giving particular attention to the following principles: (i) an effective nuclear security detection architecture to be derived from a comprehensive, integrated detection strategy prepared by the state; (ii) the national nuclear security detection architecture to take into consideration that individual organisations' roles in the field of detection are unambiguously clear; (iii) the nuclear security culture is an effective tool that can strengthen the efficiency of the nuclear security detection systems; (iv) implementation should account for, and integrate, border and interior detection capabilities.[35]

These commitments are not just verbal promises or assurances, rather, it is clear that a number tangible steps have been taken by the states in this regard to fulfill the commitments made in the following areas.

- **Elimination of Nuclear Materials:** A number of countries had reserved radioactive sources, including HEU, even though they had no big nuclear energy or weapon production plans, costing them high for their safe-keep and against the potential risk of diversion. Through the NSS, the national

33. "Nuclear Security: Seoul, the Netherlands, and Beyond", http://uskoreainstitute.org/wp-content/uploads/2013/10/USKI-NSS-Report_Full.pdf, p. 18.
34. "List of 2014 NSS Joint Statement Commitments (by country)", http://nuclearsecuritymatters.belfercenter.org/files/nuclearmatters/files/2014_nss_joint_statements_-_by_country.pdf
35. "Nuclear Security Summit 2016 Statement on National Nuclear Detection Architectures", http://www.formin.fi/public/download.aspx?ID=156370&GUID=%7BDD8E6E6A-64EC-4A1C-8443-DF56F6C41061%7D, p. 2.

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.[36] To give one example, Ukraine has completed its 2010 Summit pledge to eliminate all HEU from its territory by 2012.

The Seoul Communiqué encouraged states to minimise the use of HEU and announced a voluntary, specific action plan for how it would do this by the end of 2013. It also recommended the conversion of HEU-fuelled reactors to Low-Enriched Uranium (LEU) fuel and preferential use of LEU in commercial applications. Several countries pledged to repatriate the HEU in their territories to its country of origin. Belgium, France, the Netherlands, and the United States committed to support the conversion of the European medical isotope production to no-HEU-based processes by 2015. At the summit in 2014, the US announced that "it would remove HEU and plutonium from several civilian sites in Germany, Kazakhstan, Switzerland, and Japan before the next summit."[37]

- In addition, Belgium, France, South Korea and the US committed to cooperating on a project to produce high-density LEU fuel to facilitate the conversion of more research reactors from HEU to LEU fuel. Leaders of twelve nations — Chile, Czech Republic, Denmark, Georgia, Hungary, Mexico, Republic of Korea, Romania, Sweden, Turkey, Ukraine, and Vietnam – "agreed upon a joint statement marking the elimination of HEU from within their borders" on the eve of the Hague Summit.[38] They encouraged all countries to support HEU minimisation and elimination efforts from their territories. During these eight years, more than 1,500 kg of HEU and separated plutonium has been recovered or eliminated. Fourteen countries, and Taiwan have become HEU-free; the entire

36. Kelsey Davenport, Kingston Reif, "Nuclear Summit Seeks Sustainable Results", *Arms Control Today*, March 2016.
37. "The March 2016 Nuclear Security Summit", https://www.fas.org/sgp/crs/nuke/IN10463.pdf, March 14, 2016.
38. https://www.whitehouse.gov/the-press-office/2014/03/24/joint-statement-countries-free-highly-enriched-uranium-heu

Prior to the summit process, only 18 summit participants had ratified the 2005 Amendment to the Convention on the Protection of Nuclear Materials (CPPNM/A). Since the 2010 Summit, 26 participating countries acted on national commitments to ratify the CPPNM/A.

South America and wide swaths of Central Europe have eliminated or removed all their weapons-usable material, almost four tonnes worth.[39] Once Indonesia completes disposal of its HEU, Southeast Asia will become one more region free of all such material. In 2016, Japan removed over 500 kg of HEU and separated plutonium from its fast critical assembly. The conversion of the Kyoto University Critical Assembly to the use of LEU is underway.

- **Stronger Security Practice:** Arguably, a majority of summit participants now have a stronger domestic nuclear security practice or have the resolve to strive for it. Around forty countries, including China and India, have pledged to implement stronger nuclear security practices by incorporating international guidelines into national laws, inviting international peer reviews and "committing to continuous review and improvement of their nuclear security system."[40] As per the White House Fact Sheet (March 29, 2016), all summit countries have reported progress in enhancing nuclear security practices, including 37 countries committing to increase cooperation to counter nuclear smuggling, and 14 countries pledging to improve nuclear detection practices at ports. Around 30 countries have agreed to further cooperate on the security and managing the end of life of their most dangerous source as well as to explore alternative technology to ultimately replace high activity radioactive sources. As of December 2015, 131 states were participating in the IAEA's Incident and Trafficking Database (ITDB) programme.[41]

39. Richard Weitz and Yaleglobal Online, "Life after the Nuclear Security Summits: Are We Safe?", *Eurasia Review*, April 16, 2016.
40. "FACT SHEET: The Nuclear Security Summits: Securing the World from Nuclear Terrorism", The White House, Office of the Press Secretary, https://www.whitehouse.gov/the-press-office/2016/03/29/fact-sheet-nuclear-security-summits-securing-world-nuclear-terrorism, March 29, 2016.
41. "IAEA Incident And Trafficking Database (ITDB): Incidents of Nuclear and Other Radioactive Material out of Regulatory Control 2016 Fact Sheet", http://www-ns.iaea.org/downloads/security/itdb-fact-sheet.pdf

- **Stronger Legal Basis:** The summit process has expedited the universalisation of legal instruments relating to nuclear safety-security governance. National commitments have 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 (CPPNM/A). Since the 2010 Summit, 26 participating countries acted on national commitments to ratify the CPPNM/A. Pakistan, which did not ratify the amended CPPNM for long, has ratified it recently as part of its response to the NSS process. Undoubtedly, as a result of the NSS momentum, currently 152 countries are parties to the convention, and with Nicaragua's acceptance in April 2016, the threshold of one-third majority has been reached.[42] The amended CPPNM entered into force on May 8, 2016. In that same time period, 17 summit participants completed ratification of the International Convention on the Suppression of Acts of Nuclear Terrorism (ICSANT).

An innovative step initiated by the NSS process since 2010 is the establishment of national or collaborative Centres of Excellence (CoEs) as support centres, with the aim to improve nuclear security through training, education, technology research and development.

- **New Institutions / Centres of Excellence:** An innovative step initiated by the NSS process since 2010 is the establishment of national or collaborative Centres of Excellence (CoEs) as support centres, with the aim to improve nuclear security through training, education, technology research and development.[43] Besides, regional support centres have been conceptualised to integrate training and advice on nuclear safety-security and safeguards. In Asia, South Korea, Japan and China began discussing the potential for collaboration in 2012 and two years later, they formed the Asia Regional Network working group under the Nuclear Security

42. "Nuclear Security Agreement to Enter into Force", http://www.world-nuclear-news.org/NP-Nuclear-security-agreement-to-enter-into-force-0804168.html, April 8, 2016.
43. "Highlights of the National Commitments made at the Nuclear Security Summit", http://www.whitehouse.gov/the-press-office/highlights-national-commitments-made-nss

Support Centre Network (NSSC Network) established by the IAEA in 2012.[44]

- Many other countries have offered to join hands, both bilaterally and regionally. China has announced cooperation with the US on a nuclear CoE; Japan has launched a regional support centre for nuclear security; Kazakhstan was considering the establishment of an international training centre for nuclear security. The US had worked with Brazil to establish a nuclear security CoE and had also pursued numerous engagement programmes across the globe to develop capacity. Around 15 other countries, including Italy, the UK, India, Pakistan, have established centres of excellence for training, education, and research. Certainly, a greater level of coordination and transparency in the operations of these centres is needed and the IAEA is trying to establish a global portfolio of CoEs, and their activities.
- **Stronger Security Architecture:** The enthusiastic participation of nations and their voluntary contributions give the impression that the NSS has strengthened the resolve, as well as the process, for creating a stronger nuclear security architecture around the world. Initiatives like the removal and elimination of nuclear material, ratification and implementation of treaties, conversion of reactors, establishment and coordination of CoEs, strengthened regulations, enhancement of technology and capability "are tangible, concrete evidence of improved nuclear security."[45] Through substantial national commitments and work in that direction, the international community has perceptibly made it harder than ever for terrorists to acquire nuclear technology and material. Perhaps slow, but measurable, progress has been made on global nuclear security since 2012 and it is expected to enhance in the years ahead.

  As rightly said by Dutch Prime Minister Mark Rutte, at The Hague on March 25, 2014, "The long-running debate on improving the security of

44. "Workshop Report: Collaboration Among Centers of Excellence in Asia", https://www.wins.org/files/csis_sf_coe-workshop-summary__11-26-14.pdf
45. n. 40.

nuclear material has been like running a marathon…."[46] No number of security measures can be enough as the threats are dynamic in nature. While the terrorist threats are persisting, and nuclear and radioactive materials are being increasingly used in numerous sectors—and this trend is likely to increase in the years ahead—the fear of misuse and misappropriation will remain. The motivations and capabilities of the Islamic State of Iraq and Syria (ISIS) to conduct radiological terrorism are believed to have grown. Many radioactive materials in different parts of the world are still vulnerable. In addition, the international nuclear security architecture continues to be fragmented and predominantly based on non-binding measures. Given "the uneven and limited nature of summit commitments", the regime being a "patchwork of many treaty commitments", and the lack of universal participation, there is a lot of unfinished work required to be accomplished even after the four rounds of the summit process.[47]

A PROGNOSIS

The summits have brought the nuclear security issue to the centrestage of the global agenda. The world will realise the benefits of this initiative in the decades ahead. However, some questions have been raised, though they are beyond the mandate of the NSS and can have no definite answers: "Did the summits get us further along the road of eliminating nuclear weapons?"[48] Did the summits increase the likelihood of more countries' access to civil nuclear energy? Though most countries have shown enthusiasm in the summits, is nuclear security cooperation immune to power rivalry? Is there any mandatory international standard for the security of all nuclear materials? Undoubtedly, the summits are important, but are they adequate?

46. "Opening Address by Prime Minister Rutte at the Nuclear Security Summit Speech", March 24, 2014, https://www.government.nl/documents/speeches/2014/03/24/opening-address-by-rutte-at-the-nuclear-security-summit
47. Miles A. Pomper, "The Nuclear Security Summit will Leave Unfinished Work", *Bulletin of Atomic Scientists*, February 25, 2016.
48. Neil Joeck, "Obama's Disappointing Nuclear Security Legacy", *Foreign Policy*, http://foreignpolicy.com/2016/04/12/obama-nuclear-security/, April 12, 2016.

There can be no precise answers to many prevailing uncertainties either. Even after the NSS process, the nuclear security regime "still lags well behind the other nuclear regimes."[49] Firstly, under the current system, every country seems to be trying to make its own rules for securing nuclear materials. None of them has to tell anyone else what those rules are, or be held accountable for following them. The existing conventions in force are limited in scope and effectiveness. The current regime relies almost totally on national protection and control systems. "Lack of universality, binding standards, transparency and accountability mechanisms, compulsory IAEA oversight, and broadened scope to include nuclear weapons and other non-civilian dimensions" are some of the problems the NSS process needs to address.[50] Also, there is an urgent need for "balancing the principles of national sovereignty with international responsibility."[51]

Secondly, there are still huge gaps in the security architecture. "Despite the achievements of the Nuclear Security Summits, the threat of nuclear terrorism is not necessarily diminishing,"[52] and the risk of nuclear terrorism cannot be eliminated completely. Reportedly, in 2014, there were 170 incidents when nuclear or radiological materials were lost, stolen, or out of government control and 70 percent of these incidents occurred in the US, Canada, and France.[53]

Thirdly, many also doubt whether nuclear security will see sustainable progress without high-profile leadership and attention. The USA-Russia cooperation is constrained. Russia has raised substantive objections to continuing the summits, and feels that the US and its allies are unduly limiting Russia's role. Therefore, Russia boycotted the last summit. Does it mark a North-South divide over the global nuclear security governance and management?

49. NSGEG, "Improving Nuclear Security Regime Cohesion", The Stanley Foundation, http://www.nsgeg.org/Nuclear%20Security%20Regime%20Cohesion.pdf
50. Ramesh Thakur, "The Global Governance Architecture of Nuclear Security", The Stanley Foundation, March 2013, http://www.stanleyfoundation.org/publications/pab/Thakur_PAB_313.pdf
51. n. 49, p. 3.
52. Nilsu Goren, "The Middle East: Culprit for my Nuclear Security Insomnia", http://thebulletin.org/what-path-nuclear-security-beyond-2016-summit/middle-east-culprit-my-nuclear-security-insomnia, May 22, 2016.
53. "Five Points on the Importance of the Nuclear Security Summit", http://talkingpointsmemo.com/fivepoints/five-points-importance-nuclear-security-summit

Lastly, there are scholars who see the Summits as part of the "hype" on nuclear terrorism and there is no universally employed definition of "nuclear security". Therefore, the Summits have always aroused plenty of speculation.[54] As the NSS process has now ended, which path nuclear security efforts would embark on post-2016, is anybody's guess. No one is clear about how to establish a sustainable accountability framework for nuclear security. Post-2016, can nuclear security efforts register "continuous improvement or dangerous decline?"[55] Above all, no mechanism has been thought about yet to control or regulate military nuclear materials; and the NSS process has failed to establish regional approaches to nuclear security.

DASHING FORWARD

As pointed out earlier, despite all odds, nuclear security is not a race that anybody wants to lose. As the NSS process was an ad-hoc or temporary mechanism, not a permanent institution, there was much speculation about its logical extension. Also about what mechanism is available could ensure a sustainable nuclear security regime post-NSS. Everybody feels that there is a need for something beyond the Summit process to sustain this momentum. In that context, the last Summit has resulted in some "action plans intended to transfer segments of the summit agenda to the existing nuclear security mechanisms and institutions."[56] The five action plans of the UN, IAEA, Interpol, GICNT, and Global Partnership aim to carry forward the Summit agenda.[57] Each of these action plans undertakes specific responsibilities. For example, the UN emphasises full implementation of UNSCR 1540 which obliges states not to support the non-state actors seeking access to weapons of mass destruction.

Secondly, the Summit has established a mechanism through a joint statement by 17 countries for sustainability in reporting and information

54. Minsu Crowder-Han, "Debunking Nuclear Security Hype on the Eve of the Nuclear Security Summit", *Bulletin of the Atomic Scientists*, http://thebulletin.org/debunking-nuclear-security-hype-eve-nuclear-security-summit9214, March 10, 2016.
55. Matthew Bunn, "Nuclear Security: Continuous Improvement or Dangerous Decline?", *Bulletin of the Atomic Scientists*, March 27, 2016.
56. Hubert Foy, "Nuclear Security: From Summits to Mechanisms", *Bulletin of the Atomic Scientists*, May 5, 2016.
57. "Action Plans 2016", http://www.nss2016.org/2016-action-plans/

sharing.[58] This will encourage states to share more information on their domestic systems. It will also help to increase transparency for building international confidence to establish and maintain effective national nuclear security regimes.

Thirdly, for implementation of the summit agenda, the Nuclear Security Contact Group, created through a joint statement in Washington, will be convened annually.[59] The group is entrusted to discuss a broad range of nuclear security-related issues, including identifying emerging trends that may require more focussed attention; promote and assess implementation of nuclear security commitments; develop and maintain linkages to non-governmental experts and nuclear industry; determine any additional steps that may be appropriate to support these goals; and, make recommendations on convening any future Nuclear Security Summits.[60]

All these measures aim to carry forward the summit agenda and are considered to be the productive path ahead. But how vigorously it will be pursued during the post-Obama presidency remains to be seen. Many are of the opinion that more summits should be convened or regional approaches to nuclear security should be arranged as "risk environment can best be assessed at the regional level".[61] There can be no magic solution to nuclear security threats and challenges on the ground. The imperative is continuous and requires concerted efforts by national governments, the world community, and multilateral institutions, to make the nuclear security architecture sustainable at any cost.

58. "Joint Statement on Sustainability in Reporting and Information Sharing", http://www.nss2016.org/document-center-docs/2016/4/1/joint-statement-on-consolidated-reporting, April 05, 2016.
59. "Joint Statement on Sustaining Action to Strengthen Global Nuclear Security", https://www.whitehouse.gov/the-press-office/2016/04/01/joint-statement-sustaining-action-strengthen-global-nuclear-security
60. Ibid.
61. Nilsu Goren, "House Gifts, Gift Baskets, and the Gift of Nuclear Security After 2016", *Bulletin of the Atomic Scientists*, http://thebulletin.org/what-path-nuclear-security-beyond-2016-summit, March 25, 2016.