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This quarter (January-March 2013), the Nuclear Security Programme (NSP) at the IPCS aimed to review and critique the global stewardship of nuclear materials security and the challenges and opportunities before it. This objective guided the research and discussion component of the programme while also keeping in mind the culmination of the quarter in The 2014 Nuclear Security Summit in The Hague, Netherlands. One of the results of this exercise is this compilation of articles - they analyse the commitments and responsibilities towards nuclear materials security in general and the Summit process in particular from the perspective of South Asian States, and make concomitant policy prescriptions.

For more on this, we invite you to watch the IPCS podcasts of expert interviews on nuclear materials security at <http://bit.ly/1di1H5Z>.

Edited by

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Nuclear Security Summit 2014: Shared Risk, Shared Responsibility

Manpreet Sethi

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In just a few days, heads of governments of about four dozen nations will assemble in the Hague, Netherlands, for the third Nuclear Security Summit. An initiative started by President Obama in 2010 in Washington, the Summit travelled to Seoul in 2012 and Obama will host the next one again in 2016. What is the significance of this Summit process and has it been of any specific benefit to India?

The most important gain from these Summits is that they have brought global attention to nuclear terrorism. President Obama initiated the effort after having realized that the risk of nuclear terrorism was real and urgent. However, India's experience with cross-border terrorism well predates the US awakening to the threat. Since the end of 1990s, India has faced terrorism, sponsored and executed from Pakistan. Obviously, the threat of nuclear terrorism has been of utmost concern given that nuclear weapons (and an increasing stockpile of highly enriched uranium and plutonium) and terrorism co-exist in Pakistan.

Given this threat perception, a Summit process that demands national action and responsibility for securing nuclear and radiological materials has universalised a threat that India was fighting a lonely battle against. Attention to these issues at the highest political level has ensured their inclusion in national priorities and the accordance of necessary resources to turn commitments into reality. Heads of governments at the Summits have individually and collectively committed to taking measures to secure nuclear material on their territory according to accepted international benchmarks.

Amongst the international agreements that are relevant to this subject, two are worthy of mention. The Convention on Physical Protection of Nuclear Material (CPPNM) was crafted to regulate international transportation of nuclear material. It came into force in 1987. However, through an amendment in 2005, its ambit was expanded to protection of nuclear material in domestic use, storage and transport too. It enhanced mechanisms for cooperation to locate and recover stolen/smuggled nuclear material and to mitigate radiological consequences of sabotage. However, the amendment is not yet operative since it awaits ratification by 2/3d of the member states. The other instrument, the International Convention on Suppression of Acts of Nuclear Terrorism (ICSANT), meanwhile, came into force in 2007 mandating national laws for imposition of punitive action on those involved in nuclear terrorism. Unfortunately, neither of these instruments is universal and in fact, many of the countries that are known to harbor terrorists have not joined in, including Pakistan. However, the presence of political leaders at the Summit does exert political and moral pressure on outliers. Indeed, the number of countries joining the two Conventions has increased over the last six years, and a few more are expected to bring their decision to join in as a 'house gift' in 2014 too.

Some positive results notwithstanding, the Summit process does suffer from the shortcoming that it cannot impose uniformity in recognition of threat, or the same rigour in implementation of national efforts. Nations do perceive the threat differently. In any case, there is no punishment for non-compliance and many smaller nations have railed against the increase in need for reporting as burdensome and distracting from other national priorities.

In order to maintain the momentum on nuclear security and get nations to recognize the enormity of the risk, and hence the responsibility they share, it is necessary that a sense of stake-hood be felt by all. One way of doing so would be to foster greater sharing in two dimensions. The first would be information on best practices, for instance, on how countries practice enforcement such as training of security guards, crafting of personnel reliability programmes, tools used for data storage and mining, including on tracking of orphaned radiological sources, etc. The second would be the sharing of technologies, for instance, on manufacture of detection equipment such as scanners at ports, decontamination materials, medical countermeasures etc.

Transfer of such technologies to countries where these could be manufactured at relatively lesser cost would not only make the manufacturing hubs a stakeholder in nuclear security but also make the detection equipment available at low prices thereby relieving nations of burdensome expenditure to deploy expensive machinery or systems.

Nuclear security is not the requirement or demand of one nation. The fact that a country as militarily capable as the USA has felt the need for collective effort in this direction proves that it is a shared risk and hence a shared responsibility that must be carried by all if we are to minimize, if not obviate, an unfortunate act of nuclear terrorism. India's participation in the Nuclear Security Summit is indeed an opportunity to seek a collective redressal of a threat it faces, and also a contribution to international security – a win-win proposition either way.

India and Nuclear Terrorism: Meeting the Threat

PR Chari

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Nuclear Terrorism: Is the Threat Exaggerated?

To play the devil's advocate, it is not easy for unauthorised persons to acquire nuclear weapons or nuclear materials. Being crown jewels, they would be closely guarded by trusted cohorts. Even if they are subverted, the terrorists would have to overcome many other problems. Nuclear warheads are maintained in an unarmed state, and armed using electronic codes to ensure against accidental detonation. These codes are kept secret by the 'release authority', obviously the Chief Executive in the nation. Further, in the case of India and Pakistan, nuclear cores are kept separate from the warheads

and delivery vehicles; hence several steps have to be taken by different bodies to arm these weapons. Could all these hurdles be surmounted by a terrorist group?

Second, the problems faced to acquire nuclear materials are no less acute. Arrangements for their protection would be equally stringent. Should a terrorist group somehow gain access to weapons-usable nuclear materials, fashioning it into a deliverable nuclear weapon is not a trivial task.

Third, scenario builders have also visualised terrorist organisations gaining control over the nation, and accessing its military nuclear program and nuclear weapons. But the probability of all these events occurring must be rated low.

Nuclear Terrorism: Low Probability, but High Consequence

Despite the above, it is known that senior Pakistani scientists were in touch with Osama bin Laden. The CIA has highlighted al Qaeda's general interest in weapons of mass destruction, including nuclear weapons. Al Qaeda's branches and franchisees span the world. Moreover, several instances are known of missing nuclear materials being recovered. More alarmingly, nuclear materials have been found to be missing after they were recovered. Nuclear terrorism remains a discrete possibility, hence it should be designated a low probability high consequence event.

An imperative need consequently for the upcoming Netherlands Nuclear Security Summit to work towards establishing tighter international controls over nuclear materials; seeking greater transparency on national measures to enhance nuclear security; gaining more adherents for international agreements pertaining to the physical protection of nuclear materials; reducing the use of highly enriched uranium (HEU) and plutonium in national nuclear programmes; registering the sources of radioactive materials that have extensive medical, educational and research applications; and strengthening the International Atomic Energy Agency (IAEA).

India and Nuclear Security

India's contribution to these objectives has been considerable. It has joined the Convention on Physical Protection of Nuclear Materials, with its 2005 Amendment, and the International Convention for Suppression of Acts of Nuclear Terrorism. Further, India's execution of UN Security Council Resolution 1540 (April 2004) has been exemplary; it casts a legally binding obligation on UN Member States to enforce effective measures against the proliferation of nuclear, chemical, and biological weapons (WMDs), and their delivery systems. It is especially intended to prevent terrorists and criminal organisations from obtaining the world's most dangerous weapons. Towards this end States need to prohibit support to non-state actors seeking WMDs; adopt effective laws prohibiting activities involving the proliferation of WMDs to non-state actors; and, enforce effective measures to reduce the vulnerability of many legitimate activities to misuse and the proliferation of WMDs to non-state actors. These are essentially reactive measures.

Meeting the threat of nuclear terrorism proactively, however, requires a holistic programme that can

be framed within a matrix of four 'Ds' viz. Detection, Deterrence, Defense and Disaster Management. Clearly, detection is an intelligence function, which requires high level attention, constant vigilance, technical competence and so on. The deterrence option requires the country sheltering potential nuclear terrorists to be placed on notice, and threatened with condign punishment if any act of nuclear terrorism is perpetrated by its terrorists-in-residence. The problem here is that an organisation like al Qaeda has branches in several countries. How can a deterrent relationship be established vis-à-vis such an organisation? Defence against a nuclear attack is not feasible. Hence it must be sought within the defence and deterrence matrix. Finally, disaster management in the post-attack aftermath must comprise a mix of immediate and longer-term relief, medical assistance, evacuation and rehabilitation measures. Special measures would be needed to deal with radiation casualties. There are many grey areas here such as the first responders getting incapacitated, and the sociological impact on affected societies, of which we have no knowledge or previous experience.

India, Nuclear Security and NSS 2014

There is much that India can contribute to the Netherlands Security Summit. It could do more to meet the criticism that its nuclear programme is opaque, and become more forthcoming about its emergency response systems. It must also explain why it has not been able to fulfill its earlier commitments to establish an independent nuclear regulatory authority and a Centre of Excellence to train personnel in nuclear safety and security matters. It had contributed US\$ 1 million to strengthen the IAEA as the focal entity to ensure nuclear security. India could add to this contribution, and offer training facilities to IAEA personnel in its Centre of Excellence.

But, India should also suggest the extension of nuclear security measures by promoting pro-active measures to ensure nuclear security through a four 'Ds' programme.

Nuclear Security Summit 2014 and the NTI Index

Sheel Kant Sharma

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President Obama's major initiative launched in Washington in 2010 will enter its next stage with the convening of the third Nuclear Security Summit in the Hague. The fourth one is set for Washington in 2016. This process of Nuclear Security Summits is unique in many ways. It has brought together Heads of States/Governments from over fifty nations to discuss, define and put in action a concerted global campaign to deal with the challenges posed by nuclear terrorism by addressing threats to nuclear enterprises from theft, sabotage, unauthorised access with malevolent intent, subversion of personnel and terrorism in general.

The heightened concern about certain aspects of security of nuclear enterprises, that is, of nuclear material including uranium and plutonium and radioactive substances involved in various nuclear facilities, reactors and nuclear fuel cycle, has been there since the break-up of the Soviet Union. The US took the lead in 1994 in getting the IAEA to commence a whole spectrum of activities to prevent and combat illicit nuclear trafficking and to enhance physical protection of nuclear material and facilities. In parallel, the hugely successful Nunn-Lugar programme was also launched bilaterally with Russia to salvage nuclear material in the newly independent states of the former Soviet Union.

Initially the effort was driven by fear of proliferation but it assumed a magnified threat perception after 9/11 since it was felt that suicide-bands of non-State actors could lay hands on nuclear material or dangerous radioactive substances to create mass panic or attack nuclear reactors to release radioactivity. While the responsibility to comprehensively enhance protection of nuclear enterprises to avert, prevent and combat such menace lay squarely on the governments concerned, support has steadily grown for international response through cooperation and assistance including through provision of equipment and advisor services, sharing of best practices and broad awareness raising about danger of nuclear terrorism.

The IAEA has completed several five-year action plans to help its member states, on request, in diverse aspects of nuclear security in the same way as it has put in place a systematic programme for assisting countries regarding nuclear safety. While safety-concerned public health implications of the phenomenon of radiation is inherent to peaceful uses of nuclear energy and has received funding from the regular budget, the security-related programme has generally been funded by extra-budgetary contributions led by generous US funding.

The Nuclear Security Summit (NSS) process raised the level of international action and concern to the highest and gave a significant political profile to all related programmes in nuclear security, whether bilateral or multilateral. Participating governments have been sensitised and spurred to act owing to a high level interest in the Summit process, preceded by preparatory 'sherpa' meetings and careful drafting of declarations and recommendations for action. The impact of these summits is comprehensive in that all facets of the menace are addressed, such as reducing nuclear materials (usable for bomb-making) in reactors by converting them to fuelling with lower levels of enriched uranium, eliminating surplus stocks of such material as was the case with several successor states of the former Soviet Union, adopting measures for greater security and control such as on-site physical protection, better accounting and control, prevention of threats from insiders and capability for effective response to any security-related event.

Global norms have been emphasised in terms of legal commitments internationally, such as adherence to the twelve terrorism-related legal instruments and voluntary commitments following internationally recognised IAEA recommendations and guidelines. However, global commitments in this regard being limited in scope, the NSS process also stressed voluntary building of domestic capacity to address challenges to nuclear security, for example, by strict regulations and an effective regulatory body, legislating domestic laws for security of nuclear material, and legally effective controls on non-State actors in keeping with landmark UN Security Council resolution 1540. In addition, since the IAEA's

safeguards system provided an effective route, in particular, to keep track of and account for nuclear materials, adherence to proper safeguards was also part of the slew of recommendations from the Summits. The overall purpose of these summits will be served in assembling the full set of building blocks for nuclear security architecture to be adopted by states concerned in appropriate ways by international legal instruments, domestic legislation, assurances through invited peer review mechanisms and a widely accepted security culture.

Since this entire gamut of actions can be seen by different states in different perspectives of non-proliferation or nuclear disarmament, the NSS process has been inclusive while respecting sensitivities of states that are parties to cardinal nuclear treaties such as the NPT and bilateral and multilateral accords and arrangements. In this sense the Obama initiative on NSS might serve to alleviate to some extent the effects of the current void in international negotiations aimed at effective nuclear arms control; the credibility of the initiative being bolstered by Obama's Prague and Berlin speeches for a nuclear weapons-free world.

It is a no-brainer that no approach today would be perfect to address safety, security and proliferation challenges posed by nuclear enterprises the world over, diverse purposes of which range from limitless deterrence credibility to clean and safe energy for sustainable development. However, it is to the credit of the NSS Summits that more or less all countries with capabilities in nuclear technology are encouraged to join and invited, notable exceptions like North Korea notwithstanding.

Since the time India has been welcomed into the global nuclear mainstream with the historic nuclear cooperation agreements with the US, France and other key countries, it has become natural for India to be expected to play its due contributory role. As a developing country it was unprecedented for India, for instance, to announce a million dollar voluntary funding to IAEA's nuclear security programme, and it reflected preference to IAEA's central role which was also underlined by the NSS process. The long standing standard-bearers of the global nuclear order have their preferences and practices, at the same time, to which India's approach need not be of an outsider. In keeping with its long-term plans for exploitation of nuclear energy as a critical part of a right energy mix, India's association with the global mainstream has to be consistent and forward-looking. Hence, the association of India with the NSS process to the fullest and continued participation in it.

An off-shoot of the NSS process has been a narrowly focused civil society project by the Nuclear Threat Initiative (NTI) which has sought to create a template to observe and gauge the state of global nuclear materials security readiness through a NTI Index. It attempts to present a biennial snapshot of how weapons-usable nuclear material is secured worldwide. The second issue of the NTI Index is out but it is yet to make a desirable impact, perhaps due to grading of countries on a set of criteria that have shades of prescriptive 'one size fits all'. It needs to respect government sensitivities and predispositions to preferred national approaches to nuclear materials security. The tricky part may be how to provide due weight to areas to which particular governments attach priority given their specific situation.

A process of realistic assessment of international preparedness would have benefited from giving, at least, space for self-assessment of countries alongside the NTI team's view of them. The goal of global

nuclear security is too critical to brook contributions which risk being seen, arguably, as one-sided, and no matter how rigorously done internally, the test of any endeavour to nuclear- materials security mapping should be coherence with the main NSS process. The grading by the Index, despite its limited focus on nuclear materials, may lead some to gloating on a good score card ascribing overall national prestige while in other cases it may be viewed as an affront.

Nuclear Security Summit 2014: Pakistan's Role

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Leaders taking part in the third Nuclear Security Summit (24-25 March 2014) in The Hague, Netherlands seek to reiterate their national commitments to secure existing nuclear materials in their territories and foster international cooperation in all aspects of nuclear security.

What role can Pakistan play in furthering the aims of the NSS in the region and beyond? Why should Pakistan take the lead?

Furthering the Aims of the NSS in the Region and Beyond: Role for Pakistan

The timing is just right for Pakistan to take the lead in proposing a regional nuclear safety and security arrangement inviting both India and China to form an Asian Trilateral Nuclear Safety and Security Network (AT-NSSN). All three countries in the region have much to gain from sharing best practices on nuclear safety and security with each other and contributing to the overall nuclear learning in the region. It is ironic that the three countries meet other global leaders at the NSS forum to reiterate their national and international commitments yet they do not talk to each other about their regional commitments especially when all three are nuclear weapons states; all three share a common border and all three carry historical/political baggage which fosters insecurity and hampers cooperation.

It is only natural to start this regional dialogue and the timing could not be more perfect for such an initiative. Pakistan has announced its nuclear energy vision programme 2050 whereby it is committed to generate 44,000 MW of electric power by 2050 through the development of 32 nuclear power plants in the country. Pakistan will be able to achieve this objective through Chinese assistance and investment in Pakistan's nuclear energy sector. There has been much speculation by India and the US about Sino-Pak nuclear energy cooperation in addition to the never-ending hullabaloo about the safety and security of Pakistan's nuclear weapons given its internal security dynamics. Pakistan can hence use a tri-lateral NSSN forum to address mutual insecurities with India and China; address Indian and Chinese concerns about the safety and security of nuclear weapons, facilities and materials in the region; and discuss mechanisms for strengthening nuclear security cooperation among the three countries. The IAEA, the US and EU countries can be invited as observers to the forum.

Pakistan and Nuclear Security: Taking the Lead

Pakistan's nuclear security architecture has strengthened over the years and has achieved certain milestones since its nuclearisation in 1998, affording it a unique position. Pakistan's nuclear security regime rests on four pillars as highlighted in Pakistan's national statements made in 2010 and 2012:

- Pakistan's command and control system: The National Command Authority (NCA) with the Strategic Plans Division (SPD) as its secretariat, "exercises control over all aspects of policy, procurement, operations and most importantly, nuclear security."
- Pakistan's nuclear regulatory regime: Pakistan's Nuclear Regulatory Authority (PNRA) oversees all matters related to "nuclear safety and security, including physical protection of materials and facilities, material control and accounting, transport security, prevention of illicit trafficking and border controls, as well as plans to deal with possible radiological emergencies."
- Pakistan's export control regime: Pakistan's export controls framework is governed by several legal and administrative instruments. The Export Control Act 2004 further strengthened controls over "export, re-export, and other forms of transfer; transshipment and transit of goods, technologies, materials and equipment, including prohibition of diversion of controlled goods and technologies; covers tangible technology transfers; and includes catch-all provisions" (INFCIRC/636).
- Pakistan's international obligations: Pakistan honours its national and international commitments with regard to the nuclear safety and security of its nuclear facilities and materials. Pakistan believes in a non-discriminatory international security regime that facilitates countries to pursue peaceful uses of nuclear energy.

As a proof of its commitment to enhancing nuclear security, Pakistan has developed Centres of Excellence for Training (COEs) managed by the SPD. The training academy offers specialist courses in all aspects of nuclear security, physical protection of materials and facilities and personnel reliability. As part of its national education strategy for nuclear safety and security, a masters degree programme in nuclear engineering with a specialisation in nuclear security is offered by the Pakistan Institute of Engineering and Applied Sciences (PIEAS) and the School of Nuclear and Radiation Safety and the Nuclear Security Training Centre (NSTC) is run by the PNRA. Pakistan announced in the last NSS 2012 that it is "ready to open these training facilities, which can act as a regional and international hub, to participants from other countries in the region and beyond."

According to the NTI Nuclear Materials Security Index 2014, "Pakistan's score has increased by three points compared to 2012, putting it in the top ten most improved countries and making it the most improved nuclear-armed state in the NTI Index," (NTI Index 2014, Pakistan country report) even though Pakistan ranks 22/25 while India ranks at 23 and China at 20. Notwithstanding their ranking, Pakistan, India and China have had an excellent record of operating their nuclear facilities and securing nuclear materials for the past five decades. It is time they come together and share their experiences to enhance regional security and stability in the region.

Nuclear Security Summit 2014: India's Record

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Professor Chari's assertion on India's participation and 'results of its engagement' with the Nuclear Security Summit (NSS) as 'mixed' is moot (*Mixed Records, Carnegie Endowment for International Peace, 18 March 2014*).

Prof Chari views the Summit process as having "failed to convince New Delhi to increase transparency regarding its nuclear security practice." He alleges that India is "reluctant to make public information about its on-site and off-site emergency response arrangements for its civilian nuclear facilities." While highlighting India's positive record in terms of its adherence to legal obligations, he points towards the delay in passing the proposed Nuclear Safety Regulatory Authority (NSRA) Bill, and lack of information in the public domain on the Global Centre for Nuclear Energy Partnership (GCNEP).

First, the primary objective of the NSS is to foster a climate of cooperation to encourage participants to take domestic measures to strengthen nuclear security, preventing misuse of nuclear technology and material. The first NSS communiqué itself reaffirmed the fundamental responsibility of States to maintain effective security of all nuclear materials. The NGO, Nuclear Threat Initiative (NTI), has ranked India low in its Index on the basis of some arbitrary parameters like transparency, corruption, etc. In fact, the truth is that when the NTI approached the DAE for specific information on India's nuclear material inventory and security arrangements for the preparation of its first Index, a conscious decision was taken by the concerned authorities to not share such sensitive information with an NGO. However, India has never been reluctant to share any information with the IAEA. Therefore, while talking transparency, one must consider the issue of 'transparent to whom?'

Second, Prof Chari's assertion that India is reluctant to publicise information about on-site and off-site emergency response arrangements for its civilian facilities is erroneous. Taking into account both design-basis and beyond design-basis threats, a multi-layered protective envelope is in place around every Indian nuclear facility that includes in-built safety security systems, perimeter security, personnel reliability provisions, facility specific material protection and accounting (NMAC) systems, air defence measures, transportation security (AERB/NRF-TS/SG-10), emergency preparedness and legal provisions to oversee that nothing is mismanaged and gets out of control. Around 22 emergency response centres have been established across the country and the Central Industrial Security Force (CISF) has four groups of first responders to be activated in times of emergency. What is unavailable is the information about the steps India takes to prioritise nuclear weapons safety and security, for obvious reasons.

Third, it is unfortunate that the new regulatory authority proposed in the NSRA Bill is yet to be approved by the Parliament. However, no model of nuclear regulatory mechanism can claim to be perfect in the world. Even if there were an 'independent' regulatory institution with clear-cut division of responsibilities, where will the country get a set of scientists who will exclusively run power plants and another set of scientists who will look into the regulatory matters?

Fourth, the allegation that the information on the charter of duties and mode of functioning of GCNEP is not in the public domain is mistaken. As per the information available on its official website, the Centre will focus on the development of enhanced nuclear safeguards to effectively and efficiently monitor nuclear materials and facilities; advanced, proliferation resistant nuclear power reactors; advanced nuclear energy systems, isotopes and radiation technologies, nuclear forensics; and establishment of accreditation facilities for radiation monitoring. During 2013, a number of off-campus

training courses, workshops, public awareness and outreach programmes have been conducted by the Centre in coordination with the DAE and IAEA. Another nine such programmes are scheduled for the year 2014. As per the answer given in response to a question in Rajya Sabha (Unstarred Question No. 2018), “agreements for cooperation concerning GCNEP related programmes and activities have been signed with the USA, Russia, France and IAEA.”

Fifth, as far as ‘peer review s’ of its nuclear security arrangements is concerned, India has committed to host the Integrated Regulatory Review Service (IRRS) Peer Review Mission of IAEA and has already made a request to the IAEA in this regard. It is expected to commence late 2014.

India’s participation at the NSS underscores its commitment to ensure national nuclear security. India’s unique three-stage nuclear programme itself, based on the ‘closed fuel cycle’, ensures the security of nuclear materials. India is also working to develop proliferation-resistant fuel cycles and has developed an Advanced Heavy Water Reactor based on low enriched uranium (LEU) and thorium with new safety and proliferation-resistant features. Responding to the global concern with regard to use of HEU in research reactors, India has shut down its only research reactor using HEU fuel, and at present no research reactor is operating on HEU. At all entry and exit points, radiation monitoring devices are installed to monitor movement of radioactive materials. The Mumbai seaport, where India’s major chunk of shipping takes place, is Container Security Initiative (CSI) compliant. Suffice it to say that India had internalised the nuclear security practice in its nuclear programme much before the NSS started.

Nuclear Security Summit 2014: The Way Forward

Arun Vishwanathan

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The third edition of the Nuclear Security Summit (NSS) is being held at The Hague on 24-25 March 2014. Leaders and officials from fifty-four countries and three international organisations (IAEA, INTERPOL and the UN) are expected to assemble for the international nuclear gala. As in the 2010 (Washington DC) and the 2012 (Seoul) avatars of the NSS, the main issues which are likely to be discussed at the Hague 2014 NSS are *inter alia* nuclear materials security and preventing nuclear terrorism.

Perusing the commentaries and op-eds leading up to the 2014 edition of the NSS and the communiqués put out after by the earlier editions of the NSS, one gets a sense that mindsets needs to change if the objective of a making the world a safer place is to be realised.

First, much of the discussions seem to be more in the nature of the US and the West lecturing the rest of the world about nuclear security. There is an assumption that nuclear materials and facilities are safe in the West and the problem lies in the rest of the world. This is hardly the whole truth. A case in point is the 28 July 2012 break-in by three senior citizens into the US’s weapons-grade uranium storage facility at Oak Ridge, Tennessee. The fact that the trio managed to cut across four perimeter fences and was able to roam about freely around the Category-1 facility for almost ninety minutes without being challenged is cause for grave concern.

This then brings us to the point that in order to actually improve the security of nuclear materials and facilities it is important for world leaders to understand that there needs to be a ‘reset’ in the way the issue is approached. As Charles Perrow writes in the *Bulletin of Atomic Scientists*, “our current approach to risk is ‘probabilistic’ ... but we should also consider a worst case approach to risk, the ‘possibilistic’ approach.” Simply put, currently countries are always preparing on the basis of the last attack but are generally ill-prepared for the attack that has never happened before.

One of the possible solutions would be to pursue a ‘systems-approach’ to security. As Perrow argues, in complex systems like nuclear facilities, security must be more reliable and tightly regulated. Focusing on the people providing physical security to these facilities, it is important to be cognizant of the fact that many a time, it is a situation where very bright people are engaged in very boring jobs. This is a recipe for disaster as brought out in the Y-12 National Security Complex at Oak Ridge, Tennessee and more recently in the case of cheating by US missilliers in their proficiency tests. Constant motivation, upgradation of training techniques and ensuring high morale in these personnel - who are the first responders in case of an incident - should be the first priority.

Another issue, mentioned in Professor PR Chari’s article, *Mixed Bag*, for *Carnegie Endowment for International Peace*, which comes up quite frequently in most commentaries, is the issue of transparency. Somehow, there is a sense that if countries would just be more transparent all problems can be solved. It has been argued that because India and other countries are not transparent, all is not well in these countries.

Though it is agreed that increased transparency and better communication will help in building trust and is important during crises, it is important to realise that given the catastrophic nature of events in case of a successful attack, governments cannot be completely transparent or free in sharing their plans beyond a point.

India does put in a lot of effort in securing its nuclear material and facilities but the Indian government leaves much to be desired in publicising its efforts. However, such information is definitely being put out in the public domain and is there for one’s taking. A case in point is the wealth of information shared by the Indian Department of Atomic Energy (DAE) about its efforts on nuclear materials security in the workshop organised jointly by the National Institute of Advanced Studies (NIAS), Bangalore and the US National Academy of Sciences (NAS).

Also, India has done much in terms of tightening its domestic laws, its national export control lists (SCOMET) and as a party to various international conventions. The DAE uses the best practices while deciding on siting of facilities, working on design safety, during transportation of nuclear material and in cyber security at nuclear facilities. Somehow, all these efforts are missed by most commentators when they focus solely on ‘transparency’ which has become somewhat of a panacea for all ills.

The objectives outlined by the Nuclear Security Summit will make the world a safer place. However, in order to realise them, a rethink of current practices and an appreciation that the problems are global and the solution can be achieved only through international cooperation is needed.

Defining India's Role in Nuclear Summit

PR Chari

Visiting Professor, IPCS

How do we define nuclear security? Essentially, nuclear security involves the protection of nuclear materials to guard against its theft or diversion, or sabotage of a nuclear facility; it involves physical protection, deployment of guards to meet on sites and respond from off site to emergencies. Besides, it also involves automated systems to prevent unauthorised persons from gaining access to nuclear materials.

The Nuclear Security Summits that have reviewed these issues owe greatly to the initiatives taken by President Obama. It would be recollected that the break-up of the erstwhile Soviet Union and dissolution of the Warsaw Pact in 1990 had led to an acute angst regarding “loose nukes”.

Great fears arose that chaotic conditions in the erstwhile Soviet Republics would invite non-state actors to acquire nuclear materials and, perhaps, even operational nuclear weapons.

In his historic Prague speech (2009), President Obama highlighted the need to bring nuclear materials around the world under national and international control, and set a target of four years to accomplish this task.

Towards this end, he had declared that: “We will set new standards, expand our cooperation with Russia, pursue new partnerships to lock down these sensitive materials.” This task has yet to be completed, but it brooks no delay.

Significantly, IAEA Director-General Amano confessed that, “More than 100 incidents of thefts and other unauthorised activities involving nuclear and radioactive materials are reported to the IAEA every year... Some material goes missing and is never found.”

His predecessor, Mohamed El Baradei, had revealed that, “A large percentage of materials, which are recovered have not been previously reported as missing.”

Are we even aware then of the dimensions of this problem? Fortunately, no nuclear terrorist attack has occurred till now. But, the first such event would be as traumatic for the international system as the first use of nuclear weapons in 1945.

Two Nuclear Security Summits have been held earlier in Washington (2010) and Seoul (2012) that have underlined the need for maintaining strict security over weapons-usable nuclear materials. The Third Summit is scheduled to be held in the Netherlands on March 23 and 24. Holding the Third Nuclear Security Summit in the Netherlands has symbolic significance because the International Court of Justice and the International Criminal Court are situated in the Hague. Moreover, nuclear security in the Netherlands has been lax in the past. Apropos, A.Q Khan had stolen the blueprints for a uranium-enrichment plant from the Almelo plant in the Netherlands where he was employed.

Nuclear Terrorism

What were the broad conclusions of the first two Summits? The danger of nuclear terrorism was appreciated in the Washington Summit. All world leaders present agreed to pool their efforts to secure nuclear materials, particularly such materials present in their own territory, apart from jointly improving global nuclear security. In Seoul, the participants further appreciated the need to protect radiological sources, which can be used to make a “dirty bomb” that releases radiation, causing panic and massive social disruption. In general, these two Summit meetings have sought to raise consciousness about the need to tighten controls over nuclear materials and establish greater transparency in regard to counter-measures taken.

In the upcoming 2014 Nuclear Security Summit, the United States, Netherlands and South Korea are likely to persuade participants to commit themselves to reducing the use of highly enriched uranium and plutonium in reactors; more frequent reviews by IAEA advisory missions; national registration and protection of radioactive sources; a greater role for industry in nuclear security issues; and more information being published by states on what steps they have taken to secure their nuclear materials and facilities. A major objective would also be gaining more adherents to implement the International Atomic Energy Agency (IAEA) guidelines for protecting nuclear materials. These guidelines automatically become the national law in some Western countries, but this is not a universal practice.

Resolutions apart, what has been the success achieved so far? Significantly, the number of countries possessing one kilogramme or more of weapons-usable nuclear materials — a criterion used by the Nuclear Threat Initiative (NTI) in the US to estimate nuclear security worldwide — has reduced from 32 to 25 in the last two years, implying that seven states have removed dangerous nuclear materials from their territories. Some 12 others have reduced their holdings and arranged for their better security.

What has been India’s record in contributing to the goals of the Nuclear Security Summits? What could it do further to strengthen its own nuclear security, which is the main objective of these Summits meetings? Finally, what are the positions India could adopt in the next Summit meeting to refresh the debate?

India’s Nuclear Programme

Here, it would be fair to mention that India’s record is mixed. On the credit side, it might be highlighted that India has accepted its international legal obligations in regard to the security of its nuclear materials by entering the Convention on Physical Protection of Nuclear Materials with its 2005 Amendment, and the International Convention for the Suppression of Acts of Nuclear Terrorism. India’s record in implementing United Nations Security Council Resolution 1540, concerned with preventing trafficking in materials, technology and equipment relevant to nuclear security has been exemplary. More significantly, no case of leakage of nuclear materials from India’s extensive nuclear programme has ever come to light.

On the debit side, however, it also needs mention that India has been reluctant to inform what are its on-site and off-site emergency response arrangements for its civilian nuclear facilities, although they

have been established and are believed to be working satisfactorily. Nothing apart from a general penchant for secrecy can explain this reticence, apart from the belief that transparency compromises national security.

Further, India had committed to the 2012 Nuclear Security Summit that it would establish an independent regulatory board to oversee its nuclear programme. It had also laid its Nuclear Safety Regulatory Authority (NSRA) Bill before Parliament in 2011. However, this Bill has not been passed, and has now lapsed with the last session of Parliament having ended. Hopefully, the next government will accord priority to this matter. But this issue would have to be suitably explained to the Summit participants. Some apologists for the government have claimed that India already has adequate oversight provisions through its Atomic Energy Regulatory Board (AERB); since it functions under the administrative control of the Atomic Energy Department, there is scepticism about its independence.

Besides, India had also volunteered to establish a Centre of Excellence for sensitising and training personnel in nuclear safety and security issues. It is believed that land has been acquired for this Centre in Haryana, and buildings and other infrastructure will come up soon. Apparently, its charter of duties and mode of functioning have also been decided upon, but this information, too, is not in the public domain. There is still time for New Delhi to finalise remaining issues make a public announcement, and inform the Summit meeting accordingly.

A general issue that India should highlight in the Summit meeting is the dichotomy between words and deeds in the matter of nuclear security. Many countries subscribe to international agreements to protect their nuclear materials, establish regulatory authorities to oversee their nuclear programmes and so on. But, several have also transferred nuclear materials, technology and equipment clandestinely in violation of these prohibitions with impunity. The usual suspects hardly need mention, but they present major security threats to India. That apart, several firms in the West have also indulged in such illicit trade for commercial reasons, and with official indulgence. For instance, there is incontrovertible evidence that supplies to Iraq's nuclear program in the Saddam era were made by several European countries and the United States. An airing of these uncomfortable issues could be initiated by India. How could India contribute further to the success of this Summit? Two suggestions are made here. First, its gifting of \$1 m to the IAEA for strengthening its supervisory functions has been appreciated. India could raise the relevance of this UN body by making a further donation and also by offering to train IAEA personnel in its newly created Centre of Excellence. Second, India might erode its penchant for secrecy, become more forthcoming, and agree to a "peer review" of its nuclear security arrangements by international experts or the IAEA.

Some part of its present reluctance to accept this dispensation derives from the inability of the nuclear establishment to coordinate its policies with the foreign policy and defence bureaucracies.

Besides, India could also draw attention to the dangers involved in transporting nuclear materials, which will increase in future as appreciation grows regarding the need to keep spent fuel away from nuclear facilities, post the Fukushima disaster. Apropos. India's atomic power plants are also situated along its coastline, and are vulnerable to cyclones and other turbulences. This also applies to transferring radiological substances like Cobalt-60, which came into a Delhi market some years back. The need, therefore, to establish international norms for transferring nuclear materials by different modes of transport should be pressed by India.

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