

Report

India's Role in Global Nuclear Governance

February 24-26, 2016

Focus: Nuclear Security and India

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IDSA-PRIO Institutional Cooperation

The Institute for Defence Studies and Analyses (IDSA) and Peace Research Institute Oslo (PRIO) institutional cooperation began in 2005. Through joint research and mutual exchange, the IDSA-PRIO cooperation provides opportunities for Norwegian policymakers, civil society actors and researchers to engage in discussions with their Indian counterparts on a broad range of peace and security issues of common concern. The cooperation in its current phase provides important opportunities to examine the role of India in framing and shaping the broader international

agenda through its own conceptual lenses, and to study the emerging role of India as a contributor to multilateral dialogues and a critical actor in the evolving multipolar order. We ask two interrelated research questions: In their rethinking of foreign policy, what do Indian policymakers want and expect from other actors on the international stage? And in conceptualizing India's emerging role in a multipolar world, how do Indian policymakers view the needs and expectations of their foreign counterparts?



Introduction

The 3-day Conference on 'India's Role in Global Nuclear Governance' organised by the Institute for Defence Studies and Analyses (IDSA) and the Peace Research Institute, Oslo (PRIO) from February 23-25, 2016 was attended by scholars and policy wonks of global nuclear governance from India and across the world, who deliberated upon the challenges and opportunities of the emerging nuclear governance architecture.

Observing that states should strike a more appropriate balance between considerations of national sovereignty and international responsibility, the experts noted that the growing political consciousness of states regarding the threat, consequences and importance of the matter should be transformed into legally binding international arrangements. Several experts were of the view that India's full membership in NSG, would lead to improved global nuclear governance.

Understanding global nuclear governance requires an investigation of a number of safety, security and safeguards mechanisms. The Nuclear Non-Proliferation Treaty (NPT) and multilateral export control regimes such as the Missile Technology Control Regime (MTCR) and Nuclear Suppliers Group (NSG), the International Atomic Energy Agency (IAEA), Proliferation Security Initiative (PSI), Container Security Initiative (CSI) and UN Security Council Resolution 1540 are some prominent instruments of global nuclear governance.

Global governance needs to address the aspirations of an array of developing countries seeking nuclear energy, and not just those most

likely to succeed, noted the experts. While they cannot be deprived of their rights to the peaceful use of nuclear energy, global governance laws, regulations and conventions oblige these countries to fulfil obligations that are in the interests of all, they added. The experts further observed that evolution in the nuclear governance regime has historically always been problematic. However, crises such as Iraq's nuclear programme have helped in strengthening the regime.

Enlisting cyber security as another major concern for global nuclear governance, the experts noted the inadequacy of cyber security training in the nuclear industry. Even a small cyber attack on a nuclear facility can lead to disproportionate consequences, it was pointed out.

Nuclear Safety is an indispensable need for operation of any programme of nuclear science. Nuclear safety is an integral part of both domestic and global nuclear governance. A network of institutions such as the International Atomic Energy Agency and World Association of Nuclear Operators are in the forefront of global nuclear governance.

The United States President, Barack Obama, pushed nuclear security at the centre of global security governance in general and global nuclear governance in particular. The Nuclear Security Summit Process, initiated at the behest of the American President, galvanized global public opinion for nuclear security to counter nuclear and radiological terrorism. The two conventions for nuclear security had more members than before, yet ratification of the

Amendment of the Convention on the Physical Protection of Nuclear Materials could not take place because of the absence of the required number. The support for different instruments of nuclear security increased after the first Nuclear Security Summit in 2010. India has been an active partner of the summit process. After the beginning of the summit process, the establishment of the Global Center of Nuclear Energy Partnership (GCNEP) is the most notable of all the initiatives taken by India.

Describing nuclear security as one of the biggest challenges of the 21st century, the experts on the concluding day of the IDSA-PRIO Conference said that India needs to strengthen its institutional, legal, and physical infrastructure related to nuclear security, to ensure the safety of its nuclear establishment. Insisting that transparency is one of the key



features of India's nuclear security culture, the experts noted that complete autonomy of the regulatory body from the promoting agency should be ensured. India's entry into the export control organizations would be in everyone's

interest. Thus the international community must help mainstream India in the global nuclear order. In addition to the nuclear energy expansion plans, deteriorating regional security environment, thriving terror and smuggling networks in the neighbourhood, and prevalent domestic dissident groups were cited as other reasons for India's nuclear being fundamental and indispensable.

An effective international nuclear regime is a prerequisite for bringing in binding common standards, co-operation, reviews, transparency, and mechanisms to promote continuous improvement of the regime, the experts reflected. It would lay the foundation for confidence in the security regimes nationally and internationally, it was pointed out.

Dr Jitendra Singh, Minister of State (MoS) in charge of the Department of Atomic Energy and Space who participated in the conference, pointed that India's nuclear programme has both social applicability and economic viability. Indian nuclear programme, which commenced under the guidance of Homi Bhabha in the 1950s, was focussed on peaceful purposes and has since emerged as a major source of energy. The programme plays an important role in the fields of medicine and agriculture too. Citing lack of awareness about the benefits of nuclear technology in the country as a major challenge, Dr Singh

observed that it is crucial that India's nuclear programme is viewed at par with other nuclear programmes across the world in terms of safety, security and applicability.

India has had an active nuclear programme for the past 60 years without any accidents, pointed out the Minister, adding that the present government is keen to further strengthen the nuclear power programme for peaceful purposes and economic growth.

Reinforcing India's unwavering support for universal and non-discriminatory nuclear disarmament, Joint Secretary, Disarmament & International Security Affairs, Ministry of External Affairs, Amandeep Singh Gill said at

disarmament with "clear exposition of a way forward, a step by step process, underpinned by a shared universal commitment in an agreed multilateral framework".

Lamenting the deficit of dialogue among stakeholders, on nuclear governance, Gill insisted on the need for exchanges among them on various aspects of governance, especially nuclear security and non-proliferation.

Gill recalled that India's public and vocal stand against nuclear weapons went back to 1954 when the then Prime Minister, late Jawaharlal Nehru, proposed the idea of a complete ban on the testing of nuclear weapons. It was this call that led to the Partial Test Ban Treaty



the IDSA-PRIO conference that India remains a strong proponent of universal nuclear

(PTBT), he added. However, in later years, with the security situation deteriorating in its

neighbourhood, India felt the need to acquire nuclear weapons for its national security.

Also speaking on the occasion was Vice-Chancellor, Homi Bhabha National Institute, RB Grover, who elaborated on how India looks at nuclear technology as a resource for meeting its energy requirements. He also explained the rationale for India's closed fuel cycle and

mentioned that steps have been underway for operationalising the fast breeder reactor and the development of proliferation-resistant fuel cycles.

The authors would like to acknowledge the IDSA-PRIO coordinators Dr Uttam Kumar Sinha and Dr Ashild Kolas.

Opening Session on Nuclear Security



Chairperson: Ambassador Jayant Prasad

Opening Address of Dr R B Grover

Ambassador Jayant Prasad, Director General IDSA, distinguished delegates, ladies and gentlemen!

India looks at nuclear technology and nuclear materials primarily as a resource for meeting a part of its requirements for electricity. It considers nuclear power as safe, reliable, affordable and environmentally friendly and has been engaged in developing nuclear technologies for deployment. Continuous evolution of the framework for governance of nuclear power including export controls has been given equal importance; already discussed in this conference in the earlier sessions. International cooperation finds its due place in India's approach and it includes cooperation and dialogue at the level of Non-Governmental Organisations(NGOs) as in the case of this conference.

Nuclear security has been always important, but until about the turn of the century it was not as prominent a subject as it is today. One may recall that the document titled "Physical Protection of Nuclear Materials" was first published by the International Atomic Energy Agency



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(IAEA) in 1975 and issued as INFCIRC 225. This document went through revisions and its fourth revision was issued in 1999. The IAEA embarked on a comprehensive programme to strengthen its work in the area of nuclear security only in March 2002 by formulating a three year programme for the period 2002-05. This was followed by security plans every three years and the plan for the years 2014-17 is now under implementation. The IAEA has by now issued a comprehensive set of documents covering nuclear security fundamentals, recommendations, implementation guides and technical guides. The fundamentals are covered in the Document no 20 titled, "Objective and Essential Elements of a State's Nuclear Security Regime". The subject of INFCIRC/225 comes under recommendations. The fifth revision of INFCIRC/225 issued in 2010 is intended to serve the function of two documents, namely revision 5 of INFCIRC/225 and recommendations on the Physical Protection of Nuclear Material and Nuclear Facilities. Although the recommendations are not binding, they acquire binding nature when a reference to the document is included as an obligation in national laws or international agreements. India has included a reference to this document in its international agreements. Besides this other important documents are number 14 that gives recommendations regarding radioactive materials and associated facilities and number 15 which covers radioactive material out of regulatory control.

While recognising that the establishment and operation of physical protection systems for nuclear material and facilities is the responsibility entirely of a State, a Convention on the Physical Protection of Nuclear Material (CPPNM) was negotiated under the auspices of the IAEA and adopted in March 1980. It is the only internationally legally binding undertaking in the area of physical protection of nuclear material. It provides a sound basis for physical protection during international transport. CPPNM was amended in 2005 and amendment extends its scope to also cover nuclear facilities and nuclear material in domestic use, storage

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and transport as well as sabotage. CPPNM doesn't extend to all radioactive material and associated facilities or military material.

Ensuring security of nuclear materials and facilities is one of the several dimensions of nuclear security. Ensuring security of technologies through export controls is another dimension and that has already been discussed here. Still another dimension is development of technologies that are proliferation resistant as well as developing alternatives to the use of high radioactive sources. Therefore, for implementation, one needs national and global framework for governance.

Nuclear industry and research centres in India have internalised security practices in day-to-day working and have created a strong security culture in their respective organisations. This is of utmost importance for India because of its geographical location and is being practiced for the past several decades, since much before the western countries woke up to the issue of nuclear security. The presence of security forces in sufficient

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numbers around nuclear facilities has been a prominent feature of implementation strategy for decades and over the years several technological elements have been added. A senior officer from the elite Indian Police Service (IPS) is always on the rolls of the Department of Atomic Energy (DAE) and handles coordination with other agencies within the country. Nuclear security within the boundary of a nuclear facility is integrated with technical design of the plant and is reviewed by the Atomic Energy Regulatory Board (AERB).

Pursuit of a closed fuel cycle and the way India goes about it ensures security of nuclear materials. An open fuel cycle implies disposing spent fuel without extracting plutonium. Such a disposal would result in creating a plutonium mine for posterity. The security risk gets aggravated if such a disposal is designed to be retrievable. To ensure that there is no build-up of a plutonium stockpile, India is strictly observing the principle of “reprocess to reuse”. Reprocessing of the spent fuel and fast reactor build up are being synchronised to preclude any build-up of a plutonium stockpile. Technologies for vitrification of high level waste arising from reprocessing have been developed and vitrified waste, after it has been packed in stainless steel over-packs, is being stored in a Solid Storage Surveillance Facility (SSSF). While speaking about pursuit of closed fuel cycle, it may be worthwhile to mention that good commissioning of 500 MW Prototype Fast Breeder Reactor (PFBR) at Kalpakkam is progressing well, sodium has been loaded into the reactor and fuel for the first core has been delivered to site.

All this relates to the short-term and to address the issue of security of nuclear materials in the long-term, India is working to develop proliferation resistant fuel cycles. This effort includes developing technologies for reprocessing so that plutonium is separated along with uranium, and developing thorium based reactor systems. Thorium is intrinsically proliferation resistant due to the presence of high energy gamma rays emitted by daughter products of Uranium – 232 which is always associated in very small (a few parts per million) quantities with reprocessed Uranium – 233.

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One also has to look at science to distinguish between various materials and their threat potential, and design security system accordingly. Levels of protection defined in the IAEA documents are based on categorisation of nuclear material for use in the construction of a nuclear explosive device. They do take cognizance of the fact that nuclear material is radioactive material, which has also to be protected against unauthorised removal that could have significant consequences if dispersed or used otherwise for a malicious purpose.

Security requirements for radioactive material has also to be based on a graded approach, taking into account the principles of risk management, including such considerations as the level of threat and the relative attractiveness of the material for a malicious act leading to potential unacceptable radiological consequences (based on such factors as quantity, its physical and chemical properties, its mobility, and its availability and accessibility).

To intensify studies on this subject, the setting up of a Global Centre for Nuclear Energy Partnership (GCNEP)

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was announced by the Prime Minister of India at the first nuclear security summit held in Washington D.C. in 2010. This Centre will become an important platform for India to interact with the world community on all aspects of peaceful uses concerning nuclear energy including nuclear security, safety and non-proliferation. Extensive facilities will be set up for training nuclear security professionals. It will have several schools, including on Advanced Nuclear Energy System Studies, Nuclear Security Studies (NSS), and Nuclear Material Characterisation Studies. The infrastructure for this Centre is being developed at a location close to New Delhi and activities under the Centre are already being pursued.

There is world-wide concern with regard to the use of Highly Enriched Uranium (HEU) in research reactors and such reactors are being shut down or are being converted to operate on low enriched uranium. India's research reactor using HEU fuel has been shut down and no research reactor in India is operating on HEU. India is also working to set up facilities for producing Mo-99 by irradiating Low Enriched Uranium (LEU) targets.

The ongoing nuclear security summit process has increased the level of awareness about nuclear security amongst political leadership and top bureaucracy. India has participated in all the three summits and is participating in the preparatory processes for the fourth summit.

To conclude, various elements of India's policy in nuclear security include having in place a national framework for governance of nuclear power, taking commitments under various international instruments, participating in the NSS process and in the nuclear security related activities of the IAEA. As a country contemplating large scale expansion of nuclear power, it is necessary for India to expand fuel cycle facilities. With increasing nuclear installed capacity and huge industrial and scientific base, Indian capabilities with regard to the development of sensitive technologies can only grow. This will entail

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added responsibilities on the nuclear security front and India is prepared to take such responsibility. This includes taking recourse to nuclear science to develop technologies that can help in reducing the requirement of nuclear security.

Thank you.

Discussions

The participants from different parts of the globe raised interesting questions in their endeavour to know more about the Indian perspective of the global attempts to solidify Nuclear security architecture and the Indian nuclear security preparedness. For a query raised about India's cooperation with the International Physical Protection Advisory Service (IPPAS) mission of the IAEA, Dr Grover responded that IAEA's first workshop in India on IPPAS will be held in second half of 2016. He had reiterated India's efforts in shutting down all research reactors using HEU. He also mentioned that High density LEU fuels were a work in progress.

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Dr Grover spoke of the stellar contribution of Homi Bhabha National Institute (HBNI) in bringing various academic programmes run by various Research & Development (R & D) centres and institutions of DAE under one umbrella, ever since its inception in 2005. He emphasised the appreciable work being done in the areas of oncology, requiring radiation therapy, at the Tata Memorial Centre affiliated to the HBNI. The Centre also runs Post Graduate courses and super speciality programmes in the areas of oncology and related disciplines.

Dr Grover underscored the contribution of the GCNEP in enhancing nuclear safety and security practices in India and abroad. He spoke of the broad mandate given to the GCNEP extending beyond nuclear security in order to ensure the sustainability of the Centre of Excellence (CoE). "Our thinking process was that if we set up an institute only devoted to Nuclear Security, sustainability will be an issue. We have given a larger mandate to ensure its sustainability over the years."

Nuclear security as a short module in programmes on nuclear engineering is a prudent option than having a graduate /post graduate programme dedicated to nuclear security, in which case employability of the students would become an issue. But he had underscored that in case of professionals at lower levels, full-fledged courses will be offered.

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On the question about the declaration of No Fly Zones (NFZ) over nuclear facilities especially after concerns raised post 26/11 attacks, Mr Anil Kumar who looks after security of nuclear establishments in India, in the capacity of Inspector General (Security) of DAE, said that NFZ are in operation over all nuclear facilities in India. Dr Grover spoke of the preparedness of Indian nuclear establishment to withstand aircraft crashes at nuclear facilities. Simulations and double blind experiments with Indian and International experts were made at Tarapur a couple of years back to check the ability of the containment to withstand an air crash. The test was successfully done and the experiment was made available for everyone to compare.

Dr Grover pointed to the nuclear co-operation deals with Bangladesh and Sri Lanka. BARC had trained students from neighbouring countries in its centre. A case in point was the training of people from Vietnam. India had helped in the set up of research centres, provided various equipment to Vietnam and had assisted in the area of non destructive testing. Similar help is likely to be extended to Sri Lanka under the agreement that was recently signed. Thus, India has been open to sharing best practices in nuclear safety and security whether under the ITEC or otherwise, Dr Grover had opined.

Urban terrorism as a serious concern in densely populated cities was acknowledged. Dr Grover mentioned about the stationing of health professionals in various labs near nuclear power plants around the country and that these specialists along with the scientists will help in monitoring, in case of any untoward event. Dr Ramkumar, Distinguished Scientist and Head, Nuclear Controls and Planning Wing (NC&PW), DAE, spoke of the preparedness of the Indian establishment to emergencies. India has emergency response centres at different locations in the country. There is also an intensive network of more than 400

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radiation monitors throughout the country. He had reiterated that in the case of an eventuality, India is geared to respond within the shortest possible time. The natural radiation levels of Indian cities are known to the Indian authorities and in the opinion of Dr Grover, extensive monitoring is being done in this area with several people at the working level having been trained to handle radiation emergency under National Disaster Management Authority (NDMA).

Related questions of NDMA's preparedness to meet nuclear mishaps were raised. Mr Anil Kumar opined that NDMA has the needed equipment and capability to a large extent. There are 22 emergency response centres with Scientists and advanced equipment available at all times. Whenever a crisis happens, NDMA reaches with the local law enforcement authorities and the services of the crisis management group, which runs 24*7 control room, is always available to the teams. After the receipt of the news of the crisis, the teams respond in a very limited time, opined Anil Kumar. Large scale crisis management and off-site emergency exercises are conducted at all reactor sites once in two years with the active participation of law enforcement agencies, NDMA and others.

"Dirty bomb could cause mass disruption. It could cause a lot of fear and worry and lot of strain on health systems"

Dr Grover sought to explain the reason behind the non-use of dirty bomb by non-state actors. He told that radioactive materials cannot be handled with bare hands and if done could end up burning the handlers themselves. Robotic tools are indispensable for safely handling radioactive material and these groups have not reached such a level of technological sophistication.

As to the question why incidents of nuclear terrorism has not happened in India, Dr Grover had credited the same to the high levels of security in India's nuclear facilities So much so that even private vehicles of employees are not permitted inside the premises. He

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pointed that the Western countries have woken up to the issue of nuclear security only after the 9/11 attacks. India has been facing such situations much earlier and that had also helped shape India's nuclear security preparedness. He had also alluded to the peculiar geographical location of India in the world, where such security issues are prevalent, as a reason for India's emphasis on nuclear security and had identified that the first wave of tightening of security happened in the 1980's.

"The level of security which is there in our establishment, you will find it astonishing. This was the situation much before 9/11 happened. The Western countries have woken up to this issue only after 9/11. We have been living with this situation much earlier than that."

On the issue of the numerical accounting system for nuclear material in India, the efficiency of the Central Industrial Security Force (CISF) and their possession of special skills in securing nuclear facilities, Dr Grover spoke of an accounting system that is in place for those reactors safeguarded by IAEA. For the remaining reactors, an indigenous system of nuclear material accounting is in place , he remarked. Mr Anil Kumar supplemented by saying that CISF is one of the components of an elaborate system of security in nuclear facilities. The department requisitions young people with science background from the CISF through Memorandum of Understanding (MoU). The lack of high training of the general CISF personnel is overcome by onsite induction training for them when they are posted at the DAE. The GCNEP also runs various physical protection courses, workshops for DAE and other agencies outside the country. The training is regular and is facilitated by the in administrative training institute in DAE, Mr Anil Kumar explained.

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Session 1 - Nuclear Security, the Summit Process and Global Nuclear Governance



Chairperson: Dr Arvind Awati

Dr Awati began with identifying the three major pillars of nuclear governance which were Nuclear safety, security and non-proliferation. He opined that out of three, nuclear security was one of the weakest links in nuclear governance because of lack of any legally binding system. He pointed to the figures of global stockpiles of LEU, HEU and plutonium and noted with concern the 2,500 cases of theft, illicit trafficking and unauthorised possessions of nuclear and other radiation materials reported by the IAEA.

Dr Vladimir Rybachenkov, Senior Research Associate, Centre for Arms Control, Energy and Environmental Studies, Moscow

Dr Rybachenkov acknowledged the positive contribution of the nuclear summit process in raising

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the profile of nuclear security as a global governance challenge, in enhancing nuclear security diplomacy and in improving nuclear security. He then raised the question as to how the advantages produced by the summit process can be continued beyond 2016 without summits. He brought out the role of IAEA in nuclear security, including being the depository of CPPNM and recommending the IPPAS. But the problem with the Agency in the realm of nuclear security is that it has no legal mandate and states are free to adopt or ignore the IAEA advice. This is different from the IAEA Safeguards which are mandated by the NPT and thus legally binding, he remarked.

Dr Rybachenkov noted that substantial funding for nuclear security was provided by voluntary contribution of members and not the regular budget of the IAEA. As a result the IAEA's capability to act in the realm of nuclear security is restricted by the lack of resources and its limited mandate. Despite these limitations, the IAEA should be recognised as the principal international forum for addressing nuclear security issues after 2016 and the Agency should be geared to take up such a responsibility, he remarked. He said it would be beneficial to further develop the practical experience of gift baskets by different countries accumulated since 2010.

Dr Rybachenkov identified two ways to achieve the goal of stronger nuclear governance. One was to work within current structures thereby gradually adding more elements to the present bench work nuclear security commitments. The second way, a direct way, was to developing an international convention on nuclear security that should be built on existing relevant instruments. He opined that success would be uncertain in the first way and that the second would be a recipe for success. He stated that starting negotiations on the convention after the end of the summit process would be a logical follow up of a joint statement on strengthening nuclear security implementation which was adopted in the Hague in March 2014.



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Dr Rybachenkov spoke in length about Russian Federation's efforts to ensure security of its nuclear material. He mentioned the first and second lines of defences against nuclear smuggling , proliferation and terrorism. He spoke of the modernisation of more than 90 defence nuclear sites and elaborate radiation monitoring systems at more than 200 border crossings. He reiterated that all nuclear material, storage sites and its transportation in Russia were protected by relevant security measures at the level recommended by IAEA INFCIRC 225 Revision 5.

Dr Rybachenkov informed that Russia had attended three nuclear security summits but President Putin had decided to call off Russia's involvement in preparing the 2016 NSS. As stated by a high ranking Russian MFA official, Dr Rybachenkov noted, the main reason for such a decision was that the political agenda of the summits had already been depleted and Russia did not see any breakthrough solutions that would require the involvement of heads of states and governments. The decision was merely a result of sober analysis and realisation that everything that could be achieved in the format of such summit has already been achieved. He also pointed to the perceptible summit fatigue among many participant states in terms of investment of time and resources and the belief among them that summitry is producing diminishing results.

Dr K L Ramakumar, Distinguished Scientist and Head, Nuclear Controls and Planning Wing, Department of Atomic Energy

Dr K L Ramakumar began by apprising the audience of the status of India's Prototype Fast Breeder Reactor (PFBR). He informed that the sodium , the main coolant has been pumped and the first core fuel had been sent to the reactor site. AERB's clearances and not technological deficiency , was the reason for the delay. The delay in clearances is owing to the fact that for the first time a fast breeder reactor will be going commercial and obviously as regulator, AERB is very cautious in its approach while giving progressive clearances.

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He advocated that universal adherence to available instruments in the realm of nuclear security, harmonisation of national regulatory framework and effective application of relevant measures by the national governments can make a major contribution to this global nuclear governance with respect to nuclear security. He cautioned against having a set of preconceived notion with respect to how a nation will be assessed with respect to its nuclear security preparedness. Any yardstick that could be made available by external agencies to assess an individual nation's security in terms of certain parameters would send a very wrong signal as nuclear security completely falls in a nation's domain.

Dr Ramakumar buttressed the case of discretion when it comes to revealing sensitive information regarding nuclear programme and its security. The innocuous divulging of sensitive information could cause large scale security breaches, he opined. Any breach may result in nuclear smuggling, nuclear proliferation, nuclear threat and nuclear terrorism. Any future international convention on nuclear security should factor this international sensitivity.

Dr Ramakumar brought to the notice of participants that the nuclear security summits may delineate the responsibility to five-organs namely IAEA, INTERPOL, G8 Global Partnership against the Spread of Nuclear Weapons and Materials of Mass Destruction, the Global Initiative to Combat Nuclear Terrorism (GICNT) and UN with well defined responsibilities to address certain selective parameters. He stated his apprehension about such a delineation process leading to the establishment of exclusive domains under different agencies while the focus should be on a single item namely Nuclear Security.

IAEA, in Dr Ramakumar's opinion, has demonstrated its capabilities in two domains namely nuclear safety and physical protection and he expressed confidence that the agency will be well equipped to handle nuclear security issues as well. IAEA is not very new to nuclear

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security and at the 59th regular session of IAEA General Conference, member states reaffirmed the central role of IAEA in strengthening nuclear security framework globally and containing international activities in the field of nuclear security.

Dr Ramakumar made reference to an IAEA declaration that duplication and overlap needs to be avoided. He opined that multilateral agencies should not work on a specific agenda as resources are limited and there is a need for objective and effective utilisation of existing resources . He expressed belief that NSS would be the appropriate forum to advice IAEA to take up this responsibility. He lastly laid emphasis on the need for global nuclear governance to factor in local concerns about sensitivity of information.

“We have a global governance but it has to take national sensitivities into picture. Thank you for your attention.”

Dr Ranajit Kumar, Head, Physical Protection Systems Section, Bhabha Atomic Research Centre (BARC)

Dr Ranajit Kumar’s presentation intended to showcase the regulatory practices adopted in India for civilian nuclear facilities and radioactive facilities and their transportation. He emphasised the need for approaching nuclear security and safety as an added responsibility and not as a liability.

“Today you cannot delineate nuclear security from nuclear activity and that is how it is practiced in India . Here nuclear security and nuclear safety are considered added responsibility and not as a liability and that is what is important to bring out here.”

Dr Ranajit Kumar informed that the approach taken for nuclear security in India is as prescribed in the International forum by the IAEA and is a three -tier strategy. The first tier is to prevent any material going out of control. In the first line of defence physical protection measures for radioactive material, nuclear material and their use is provided in a facility including

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their transport in all phases of the life cycle. Second line of defence involves detection of the material which is going out of the regulatory control. Third line of defence is in operation whenever the material is going out into the public domain and once again out of the regulatory control.

For concerns raised about India's nuclear security preparedness, Dr Ranajit Kumar responded that there is a very effective response network in place. He apprised the audience of the presence of 22 emergency response centres which are well connected and the monitoring of background activity level on a regular basis by the emergency response centres. There are around 500 monitoring centres which are well connected and give the real time status of the kind of activities taking place in their area. All of India's nuclear power plants and other related facilities including nuclear fuel cycle facilities are effectively covered under this network, he apprised.

Dr Ranajit Kumar informed the participants about DAE's crisis management centre. The large number of personnel are well-trained in responding to such events, he noted. He expressed pride that whatever event had happened thus far had been contained by the technical assistance from the DAE with the help of other law enforcement teams as well as NDRF.

Dr Ranajit Kumar made a reference to IAEA's nuclear security series guideline number 15 that addresses material out of regulatory control noting that India follows all its stipulations. He added that India security practices exceed what is stipulated in those guidelines. AERB is responsible for all the regulatory activities in the domain of safety as well as the security in the nuclear as well as the radioactive sources, facilities and its transport. He informed that AERB has three tier review process. The first tier has three committees namely Committee for Review of Security Aspects of Nuclear Facilities (CRSANF), Committee for Review of Security Aspects for Radiation Facilities and Transport (CRSARF& T) and Advisory Committee on Security

The presence of 22 emergency response centres which are well connected and the monitoring of background activity level on a regular basis by the emergency response centres. There are around 500 monitoring centres which are well connected and give the real time status of the kind of activities taking place in their area.

India security practices exceed what is stipulated in those guidelines. AERB is responsible for all the regulatory activities in the domain of safety as well as the security in the nuclear as well as the radioactive sources, facilities and its transport.

(ACS) . CRSANF is responsible for all the nuclear power plants and nuclear fuel fabrication facilities, the regulatory aspect of all the nuclear power plants and regulatory facilities.

Dr Kumar further informed that the ACS reviews all the decisions and recommendations of these two committees and then recommends to the next tier committee which is called Safety Review Committee for the Operating Plants (SARCOP). The second committee is Advisory Committee for Project Safety Review (ACPSR) and the third is- the Safety Review Committee for Application of Radiation (SARCAR). The first two are for nuclear power plants and nuclear facilities but the third committee is for the purpose of radiation facilities and the radioactive sources and transport and such issues. Top of all these is the AERB, that is responsible for the safety and security of the nuclear power plants as well as the radiation facilities and transport and all related aspects.

In Dr Kumar's presentation, AERB has developed a number of guideline documents, and they are not publicly available. He noted that the security mechanisms are internally peer reviewed by various committees and taken very seriously. He pointed that radiation sources and radioactive facilities are much more in number than nuclear facilities as the former has wider application in industry and for medical purposes. Hence the need arises for regulation of radioactive sources from cradle to grave, meaning the entire fuel cycle.

Dr Ranajit Kumar apprised that there are two types of approvals given to operators of radiological facilities. AERB approves the emergency and security plan that is submitted by these operators besides giving licenses for installation, safe and secure source storage of radioactive material. The stringent licensing process requires lot of information to be provided, he noted. Security reviews besides the approval of trained and certified radiological safety officer are mandatory. A commitment had to be made by operators to the supplier to return spent fuel sources to the latter, Dr Kumar explained . If the private sector wants to import certain radiological sources ,

Security mechanisms are internally peer reviewed by various committees and taken very seriously

There are two types of approvals given to operators of radiological facilities.

approval of package and shipment of source transported within the country or coming from abroad has to taken from the AERB This was in addition for the approval for disposal.

There are even pre-licensing requirements which are followed for category 1 and category 2 sources very meticulously, Dr Kumar explained. This includes police verification certificate of the radiation facility workers and registering the security plan of the facility with the nearby police authority. The state police agencies are regularly trained in the security seminars organised for them. He also elaborated on the Online reporting system called ELORA which results in reporting of loss or theft to police and AERB within 24 hours. In case of transport of radioactive material ranging from category one to category three sources, the regulatory process involves online tracking of the packages. He mentioned about two publicly available documents from the AERB that deals with security of radioactive sources in radiation facilities and during their transport respectively. He called the system integrated security system.

Dr Ranajit Kumar traced India's involvement in nuclear security from 1972. The first book of INFCIRC 225 was called the grey book and he pointed that the first drafter was from BARC. He spoke of India's involvement in the spreading of nuclear security awareness, achieved by the conduct of four to five training courses with IAEA and other partner's countries. He had concluded by saying that India's contribution in combating insider threat could be understood by the fact that four out of eight faculty participation for the international training course on protection and preventive measures against the insider threats was from India.

Discussions

Dr Ramakumar explained that there is a definite laid out plan with respect to implementation of nuclear security measures from the start to the end. He spoke of infrastructure to locate orphaned radioactive sources. This is shared with IAEA. The entire episode was a

Pre-licensing requirements which are followed for category 1 and category 2 sources very meticulously

The Online reporting system called ELORA which results in reporting of loss or theft to police and AERB within 24 hours.

India's involvement in the spreading of nuclear security awareness, achieved by the conduct of four to five training courses with IAEA and other partner's countries.



success; remarked Dr Ramakumar.

Dr Ranajit Kumar pointed that the approach taken for nuclear security measures in India is called Risk Reduction approach whereby attempts are being made to bring risk to an acceptable level. He exhorted that before the question of why nuclear terrorism had not taken place in India was raised, the question of why there was no major safety related incidents needs to be considered. Dr Ranajit Kumar attributed the same to the stringent nuclear security practices in India. But he also cautioned against the danger of sharing details of sensitive information.

Dr Ranajit Kumar addressed the question about the adequacy of INFCIRC 225 by stating that India adopts more stringent action and robust measures than INFCIRC 225. With reference to security at the front end of the nuclear fuel cycle specifically the mining process, he responded that the Document Preparation Profile (DPP) was rejected because of the lack of support from the countries still pursuing mining activities.

For the question relating to white paper, Dr Grover highlighted civil society's demand for transparency as opposed to the basic tenet of nuclear security which was confidentiality. With regard to nuclear safety, India is party to the convention on nuclear safety. Every three years Conference of Parties is held where country report is prepared by India which is available online. With regard to safeguards, India has been interacting with IAEA ever since the reactor at Tarapur became critical, noted Dr Grover. He opined that a white paper on nuclear safety and security should never be done. Confidentiality is a basic tenet of Nuclear Security practices. With reference to INFCIRC 225, India had mentioned the same in its cooperation agreement and had exchanged notes with countries that took its side. In case of the convention on nuclear safety, all countries submit their reports every three years and those reports are assessed and discussed but the same cannot be done for nuclear security, Dr Grover remarked. In a future convention on nuclear security, a paradigmatically different format will be required to protect the confidentiality of information.

India adopts more stringent action and robust measures than INFCIRC 225



Confidentiality is a basic tenet of Nuclear Security practices.

In a future convention on nuclear security, a paradigmatically different format will be required to protect the confidentiality of information.

Session 2 - The 2016 Nuclear Security Summit and After: Setting the agenda



Chairperson: Dr S. Gangotra

Dr Vitaly Fedchenko, Senior Researcher, European Security Programme, Stockholm International Peace Research Institute (SIPRI)

Dr Vitaly Fedchenko opined that the NSS process gave new impetus to cooperation on nuclear security. He told that nuclear security events are often international in nature (e.g. illicit trafficking of nuclear materials), relatively rare and it is hard to justify any permanent response. Hence, international cooperation in nuclear security is very important. According to IAEA, nuclear security is the responsibility of member states. However, international cooperation is needed to prevent illicit trafficking of nuclear materials and nuclear security summit provided an opportunity for developing that kind of cooperation.

For Dr Fedchenko, cooperation between frameworks is important as the general trend for the same capabilities can assume multiple roles. Though Fukushima was a safety related incident, it had an impact on the nuclear security. During the handling of the incident it appeared

According to IAEA, nuclear security is the responsibility of member states.

that both Comprehensive Test Ban Treaty Organisation (CTBTO) and IAEA have information and capabilities that needs to connect very much in order to provide a proper response to the Fukushima incident. This was difficult to do earlier. Now synergy of capabilities between IAEA and CTBTO is taking multiple roles.

Dr Fedchenko viewed that in the case of nuclear forensics it can help in leveraging (previously disconnected) radioactive material analysis capabilities for purposes of nuclear security. The term 'nuclear forensic analysis' was first coined in the 1990s in the context of combating nuclear smuggling ; hence used in the NSS process. IAEA's nuclear security guidance document defines nuclear forensics as 'the examination of nuclear and other radioactive material, [...], in the context of legal proceedings.' Nuclear forensics process involves sample collection, characterisation and interpretation for nuclear attribution.

Dr Fedchenko discussed about nuclear forensics that has common applications like law enforcement and counterterrorism. It can be used for combating the illicit trafficking of nuclear materials in post-explosion forensics and other post-event applications. Nuclear forensics can be used in the context of international law and non-proliferation. Nuclear forensics can be applied for NPT verification - IAEA safeguards, verification in Iraq; for CTBT verification - radionuclide component of the International Monitoring Stations Onsite Inspections) and; International monitoring of the CTBTO; Fissile Material Cut-off Treaty (FMCT) verification - determination of reactor's lifetime Plutonium (Pu) production and detection of undeclared production. In the domain of arms control and disarmament, verification of bilateral arms control treaties can be done with the application of these nuclear techniques.

Dr Fedchenko informed that during the NSS summit process, several countries have pledged to improve their nuclear capabilities as part of their nuclear security responsibilities. The IAEA guidance document on nuclear forensics: development of a capability should



Nuclear forensics it can help in leveraging (previously disconnected) radioactive material analysis capabilities for purposes of nuclear security.

During the NSS summit process, several countries have pledged to improve their nuclear capabilities as part of their nuclear security responsibilities.

begin by identifying existing capabilities, including facilities that are already established and relevant expertise that is already used for other purposes.’ Incidents of illicit trafficking cases are rare, which makes it difficult to justify the cost of maintaining fully established laboratories for investigating illicit trafficking. This is also not proficient because the experts will be handling only a few cases a year. However, international cooperation with other states and international organisations in the area of nuclear forensics is vital as it provides building and sustaining necessary capabilities. It also allows cost-cutting opportunities.

Mr Anil Kumar, Inspector General (Security) , Department of Atomic Energy (DAE)

Mr Anil Kumar opened up his lecture by saying that nuclear security is a very elaborate matter with the primary focus being on physical security. India's experience in nuclear energy is vast. India's RAP 5 reactor completed 765 days of continuous run in 2015. India has indigenous glass vitrification facility for high-level nuclear waste. All this contributes to security.

He also addressed why does India not issue a White Paper? He informed that as part of its commitments to strengthening nuclear security, the MEA, Government of India published such a paper in 2014. India's approach to nuclear security consists of five elements - government, institutions, technology, international cooperation, nuclear security practice and culture. India has an Atomic Energy Act (AEA) and several institutions to sustain its nuclear security standards. Apart from this there is a manual of security of critical infrastructure, issued of Ministry of Home Affairs (MHA), Government of India. The DAE has issued a security manual for DAE facilities. With these acts, guidelines and rules in place, it provides a strong basis for providing security in our facility.



India's experience in nuclear energy is vast. India's RAP 5 reactor completed 765 days of continuous run in 2015.

India's approach to nuclear security consists of five elements - government, institutions, technology, international cooperation, nuclear security practice and culture.

Mr Anil Kumar also discussed the institutional framework for nuclear security in India. The AERB has mandate for safety and security both and this to a large extent helps in synergising safety and security. The Nuclear Control and Planning Wing (NCPW) looks after the safeguard issue. The Computer Information and Security Advisory Group (CISAG) has been created at the apex/ departmental level for protection against cyber threat. There is another body above this, which is at the governmental level, and there is a facility level body. Here, India has embedded a physical security person of the facility with the facility level body of Cyber Security so that if there is any need for action by physical security people after receiving credible information from the cyber security people, both actions can be coordinated. This is a fully developed system.

Mr Kumar also informed about the Crisis Management Group (CMG), which is in charge of dealing with radiological and nuclear emergencies and incidents under the DAE as the nodal ministry. The CMG takes experts from various fields and runs a 24/7 control room where any communication can be accessed. India participates in various Safety mock exercises with IAEA, which has given India commendation in combat, communication and international communication exercises.

Counter Nuclear Smuggling Team (CNST) a multi-departmental platform was also discussed by Mr Anil Kumar. He said that this platform was created to integrate various agencies having capabilities of investigation, border management and nuclear forensics while combating cases of nuclear smuggling. Information is compiled at the national platform that meets every quarterly to assess the threat scenario, conduct table-top exercises for role clarity and evaluation of other security issues.

Mr Anil Kumar reported that in 1987, the Standing Group for Coordination and Review of Security Arrangement (SG-CRSA) for all Indian Nuclear facilities

The Computer Information and Security Advisory Group has been created at the apex/ departmental level for protection against cyber threat.

The Crisis Management Group (CMG), which is in charge of dealing with radiological and nuclear disasters and incidents under the DAE as the nodal ministry.

The Standing Group for Coordination and Review of Security Arrangement (SG-CRSA) for all radioactive and radioactive facilities came into being.



came into being. It has representation from security agencies of Government of India - military security, intelligence agency, investigative agency, the facility owners and the departmental experts headed by an additional secretary level. The group meets every once in four months and the primary aim is to exchange threat information, whether there is any change in the threat scenario, new emerging threats, what the other national intelligence agencies are thinking about the threat from various sources both insider and outsider threats and evaluate their physical security arrangements.

Mr Anil Kumar gave relevant details of other facets of nuclear security in India. These facets are described as follows:

- **Nuclear Security Practice and Culture architecture**

- o Integrated Security Systems with periodic audit by AERB.
- o National Design Basis Threat(DBT) document
- o Central Industrial Security Force(CISF)
- o Periodic Security Audit by Central Agencies.
- o Periodic Mock Exercises of various security scenarios with combined stakeholders.
- o Personnel Reliability measures
- o BARC Training School
- o Nuclear Measurement Analysis and Control(NUMAC) System

- **Central Industrial Security Force (CISF)**

It is one of the Central forces deployed in India's nuclear facilities. Though they work in the DAE but they do not report to the DAE. They report directly to the MHA who is the controlling ministry of the forces. However, at the Secretariat level, there is coordination and it acts on the guidelines designed for a nuclear facility.

The group meets every once in four months and the primary aim is to exchange threat information, if there is any change in the threat scenario, new emerging threats

Other national intelligence agencies are thinking about the threat from various sources both insider and outsider threats shared every quarterly and evaluate their physical security.

- **Periodic Security Audit by Central Agencies**

Apart from regulatory audit of the physical protection that is a very well developed system, there is a security review by the central agency once in two years. They come from the central government after a committee is constituted with the help of the central government and state government agencies and they do a full security audit in three to four days in one facility. The reports are shared.

- **Periodic Mock Exercises of various security scenarios with combined stakeholders**

This is another important factor. The CISF has on-site response force and is given some typical scenarios for mock exercises which they do every fortnight. They also do mock exercises once in six months where other stakeholders on the site collaborate and act in a cohesive manner. They further do mock exercises once a year with outside agencies.

- **Personnel Reliability measures**

India has a very developed system of Personnel Reliability measures. This system is guided by sanctions, rules and guidelines under the Government of India under which personnel reliability checks and measures are conducted. A lot of activities are done and there is a continuous check on the human resources. It is not static but a continuous process.

- **BARC Training School**

This training school was started way back in 1970s. The early leadership had a clear vision on nuclear security. Initially, the BARC Training School trained in Nuclear Security to all the trainees as a part of curricula. After 2010, due to some academic regulatory restrictions it was removed from curriculum and now it is part of off-campus courses on a continuous basis on various aspects of security and precautions to be taken for reducing the vulnerability.

The CISF has on site response force that is given a typical scenario which they do every fortnight.

India has a very developed system of Personnel Reliability measures.

India's Nuclear Measurement Analysis and Control System also contributes enormously to strengthening the nuclear security of the nuclear materials and facilities

Technology:

There is design and deployment of radiation detectors and portals at border entry points and nuclear facilities. This objective is to prevent any illicit trafficking.

- **Secure Communication Network system**

India had developed an indigenous system and deployed:

- **Radio Frequency ID Cards in all Indian facilities**

Whenever radioactive sources of category I and II are transported, they are tracked throughout from the origin to the destination point. Secondly, there are instructions to the personnel for no movement in the night. The whole transport plan is first agreed and then it is allowed to take transport. There is transport emergency (TREM) card placed in every vehicle for assistance in case of any accident happening on way and where there are no experts available in the vicinity for various nuclear consignments. Presently it is developed in three Indian languages and English. It is going to be available in all Indian languages and going to be kept with the consignment at three/ four places like the driver, conductor, the place where nuclear consignment is kept in sealed container so that in case of any extreme nuclear emergency, at least one card is available to nearest law enforcement agency who reaches there first to read it and follow the instructions on it. Relevant telephone numbers are also given, what precautions must be taken, how many meters of distance are to be cordoned off till any expert emergency responder reaches the site for the needful assistance. India is transporting nuclear fuel for various power plants all over the country. There have been no accidents so far.

There is transport emergency card placed in every vehicle for assistance in case of any accident happening on way



India is transporting nuclear fuel for various power plants all over the country. There have been no accidents so far.

There is a three tier nuclear security for Indian nuclear power plants as per the IAEA regulation. . In AERB's nuclear security guidelines India has been prescribed four tier of security. It starts on the exclusion zone, which is 1.6 kms from the reactor. From there the entry is restricted. There is main plant boundary, the operating inland and every area is having a secured system. The first two layers where the detection and response is manual the last two layers are automatic. Networked cameras with video analytics, sensors, barriers, access control measures are operated for nuclear security.

- **India's Closed Fuel Cycle**

There is no stockpiling of Plutonium. India has stated a policy "reprocess to reuse". Proliferation resistant technology is followed under the GCNEP where various schools will be entrusted with the job of developing proliferation resistant technology and design basis security system. There are many design basis safety systems in the reactor. Likewise, a similar stringent design basis security system is also to be incorporated in the reactors. The AHWR, which is a proliferation resistant Reactor design, is indigenously developed by India. There are plans to erect 300MW AHWR reactor in the near future.

- **International Cooperation in Nuclear Security and India**

India is Party to all the 13 universal instruments to combat International Terrorism including ICSANT. India has also included the elements of ICSANT in our major national anti-terror laws. Any terrorist organisation nuclear materials for terrorism are made a punishable offense with life imprisonment. India has already ratified 2005 amendment of CPPNM and also adopted the recommendations of INFCIRC/225/Rev5 in its national guidelines. The AERB nuclear security document for nuclear power plant is under review which will include all provisions of the information circular INFCIRC/225/Rev5.

There is a three tier nuclear security for Indian nuclear power plants as per the IAEA regulation. . In AERB's nuclear security guidelines India has been prescribed four tier of security.

There are many design basis safety systems in the reactor. Likewise, a similar stringent security basis system is also incorporated in the reactors.

India is Party to all the 13 universal instruments to combat International Terrorism including ICSANT.

India has also adopted 2003 IAEA Code of Conduct on Safety & Security of Radioactive Sources and adheres to guidelines of NSG on supply of nuclear items. India has voluntarily placed civilian facilities under IAEA safeguards and has completed all its obligations. India has invited the World Association of Nuclear Operators (WANO) that has conducted peer review of various NPPs. There are people coming for safety review and oversee the security arrangements. Post-Fukushima, the IAEA's Operational Safety Review Team (OSART) mission was invited and the conducted safety review of two NPPs. India's systems were appreciated by the IAEA. The IAEA had also conducted a regulatory peer review of AERB and commended its guidelines.

India supports UNSCR 1540 and has also submitted a national report. India has hosted an international workshop on UNSCR 1540 in November-December 2012. It participates in IAEA's Illicit Trafficking Database (ITDB). India has been very honest to this participation. India is Party to Global Initiative to Combat Nuclear Terrorism (GICNT) since 2007 and Co-operates with World Customs Organisation (WCO) & INTERPOL's Radiological and Nuclear Terrorism Prevention Unit (RNTPU) on Nuclear Trafficking. India has invited INTERPOL to hold a workshop on counter nuclear smuggling from March 14 -16, 2016 in Mumbai.

The NSS process (2010 at Washington, 2012 at Seoul, 2014 in Hague and the last in 2016 at Washington) has raised awareness and massive political support for protecting nuclear and other radioactive materials from falling into the hands of terrorists. Its objective is to constitute a political commitment by the participating states to carry out, on a voluntary basis, actions 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 these materials for malicious purposes. On the Summit's Gift Basket Policy, there is a strong reservation.

There are people coming for safety review and oversee the security arrangements.

India supports UNSCR 1540 and has also submitted national reports.

India has undertaken several pledges. Much before the NSS process started, India ratified the CPPNM/Amendment and ICSANT. It established the Global Centre for Nuclear Energy Partnership (GCNEP). It is expected that by March 2017, on-campus courses will start shortly. It has already conducted international workshop on Insider Threat, Vulnerability Assessment and Physical Protection Systems. National workshops on countering Nuclear/Radiological threats for various stakeholders are being done under the GCNEP aegis. India is also training various state law agencies.

Handling nuclear and radioactive materials is a technical issue. Law enforcement agencies handling various kinds of jobs handle cases of nuclear and radioactive material very rarely. To deal with this constraint, India had adopted a strategy for picking up technical units in the local law enforcement agencies for handling such emergencies. The local law enforcement agencies developed various expert groups depending on their security scenario. These agencies are very receptive to technology and information.

The spent fuel has been placed under safeguards. India has no HEU fueled reactors. India has representatives in the drafting groups on Action Plans of UN, IAEA, GICNT and INTERPOL to be chosen by the NSS to strengthen the nuclear security regime. India is also inviting IPPAS mission of IAEA in 2016 and plans to hold an international workshop on GICNT in 2017. India's regulatory system is very robust and practically they are independent. India is also introducing the Nuclear Security Regulation Bill shortly in Parliament.

Other measures like contribution to IAEA's Nuclear Security Fund; deployment of Radiation detectors and portals at 13 sea ports and airport and ; formation of National Counter Nuclear Smuggling (CNS) Team are undertaken by India to part of its commitment towards strengthening a robust nuclear security regime.

Much before the NSS process started, India ratified the CPPNM/Amendment and ICSANT.

Law enforcement agencies handling various kinds of jobs handle cases of nuclear and radioactive material very rarely.

The spent fuel has been placed under safeguards.

- **Setting Agenda for NSS 2016**

As part of the future agenda of the NSS process the CPPNM/A should enter into force. NSS process had evoked a very positive response and this needs to be maintained. There is a need for an organisation to carry forward the legacy of the NSS process. There has to be a consensus on the organisation that must be entrusted with this responsibility. It is also important that this responsibility is given to one agency rather than multiple in order to avoid misgivings and resulting gap areas. The Cyber Terrorism relating to Nuclear Facilities should also be focused on for international cooperation.

- **Role of IAEA**

Nuclear security is a complex issue consisting of safety, safeguard, and physical security. IAEA should be given the lead role and other organisations e.g. INTERPOL, GICNT and GP should support and coordinate with activities of IAEA. IAEA's current advisory role should be supplemented with powers of enforcement

- **NSS 2016 & Beyond: The Way Forward**

National Responsibility is of primary importance to Nuclear Security. The International governance has to evolve with national responsibility. There must be restricted transparency in order to preserve confidentiality of nuclear security. This has also to be respected whether in the civil society or anyone else. There can be exchange of information without violating proprietary norms and national laws. Proliferation resistant technology is one of the ultimate aims to make our nuclear materials more secure. The role of GCNEP in regional cooperation is important in both regional and international level. Radiological and Nuclear Terrorism Prevention Units should always be integrated with CBRNE Terrorism Prevention Unit of INTERPOL.

There is a need for an organisation to carry forward the legacy of the NSS process.

The Cyber Terrorism relating to Nuclear Facilities should also be focused on for international cooperation.

IAEA should be given the lead role and other organisations e.g. INTERPOL, GICNT and GP should support and coordinate with activities of IAEA.

National Responsibility is of primary importance to Nuclear Security.

Dr.H. P.Nawada, Scientific Officer, the Nuclear Controls and Planning Wing (NCPW) , the Department of Atomic Energy (DAE)

Dr H P Nawada started his presentation by stating that India has a science and technology development programme since 1950s. Then he posed the question: what are the advanced goals of India? He stated that the reactors and the nuclear energy system which include the fuel cycles should have high economy and enhance safety. It must help in minimising of nuclear waste and make it proliferation resistant. Security is also becoming a crucial concern and these aspects have to be inbuilt in the system. He answered another question: How do you manage spent fuel? In case of India, the spent fuel is reprocessed and valuables like Pu other actinide like iridium is recovered and reused in different reactors. India has a three stage power programme— three interconnected cycles.

Dr Nawada pointed out the alarming aspect about nuclear fuel that across the globe, there will be 400, 000 tons of spent fuel, according to the IAEA. Though 25 per cent is reprocessed the rest remains as waste. A decision is to be taken as this poses a serious security concern. It is not so much a proliferation problem but it is a concern. If nuclear fuel is put in a canister and buried deep underground there is no problem but involves security issues. In a closed fuel cycle, spent fuel is not very radioactive. When plutonium is recovered from spent fuel the toxicity reduces so drastically and it is reduced to the level of natural uranium with a whole life of 300 to 400 years. The closed fuel cycle provides an advantage of nuclear fuel being used for civilian purposes.

According to Federation of American Scientists (FAS), 53 tons of weapons equivalent of Pu are available. If nations do not have the appropriate programme like fast breeder reactors system for these materials, it may cause problems. Radiotoxicity mainly comes from Pu, other actinides and uranium. In the closed fuel cycle, nations must have fast breeder reactors. Advanced energy



In case of India, the spent fuel is reprocessed and valuables like Pu other actinide like iridium is recovered and reused in different reactors. India has a three stage power programme— three interconnected cycles.

In a closed fuel cycle, spent fuel is not very radioactive. When plutonium is recovered from spent fuel the toxicity reduces so drastically and it is reduced to the level of natural uranium with a whole life of 300 to 400 years.

systems provide holistic assurances for nuclear material management that can further help development of the nuclear energy system. fast breeder reactors are ideal to burn all the actinides. However, it is not possible for one nation to have all these systems hence there is a necessity for developing multilateral approaches for appropriate nuclear fuel cycle approaches. One of the best approaches is to burn all these actinides.

Dr Nawada discussed division of the countries into two categories: fuel states and reactor operator states. This will rule out proliferation problem. Thermal reactors are used for plutonium burn. However, this process is less cost effective. Hence, he viewed that the international movement should be to define the trajectory of the nuclear programmes and proliferation resistant aspects of the nuclear fuel cycles.

Discussions

During discussions, following points emerged:

- Policy for nuclear fuel cycle is to address the development of advanced nuclear energy systems.
- India's nuclear security arrangements are detailed, greatly transparent and comprehensive, and it does not damage India's nuclear security.
- The BARC Training School has started conducting off campus training courses for sensitising human resources
- IAEA must be given a key-coordinating role amongst all international agencies in terms of international response. IAEA is the key platform for addressing nuclear security issues.
- The areas where nuclear scientists live are adequately protected. There are 60,000 employees working at a time.
- The BARC Training School is the basic pillar of training for developing high level scientists. This

Advanced energy systems provide holistic assurances for nuclear material management that can further help development of the nuclear energy system. fast breeder reactors are ideal to burn all the actinides.



The BARC Training School has started conducting off campus training courses for sensitising human resources

starts from the graduation level. Earlier it was giving post graduation degree. It has a full curriculum on nuclear security now. Some courses are being additionally offered on how to strengthen security and reduce vulnerability.

- Cyber threat – a mechanism for rapid response and effective cooperation is required. The IAEA has the domain knowledge and expertise on various issues that affect nuclear industry. The IAEA should be given a more prominent role in it.
- India has a communication system in disaster management where the district/civil authorities communicate about any incident through the Central Control Room (CCR) within (MHA). Dissemination of information and guidelines through this unit for responding to a situation is conducted.
- Would the nuclear governance now require all the safeguarded materials in some nuclear data bank? Safeguard relevant information is not useful for forensics because it is not detailed enough. Nuclear libraries require a lot of information. The current idea is to have the information in nationally owned libraries. There is no consensus among nations to share this information with other countries except whether they decide to provide that information. Should there be a movement in the IAEA to require such a databank? It is impossible politically but it must not be ignored because of political reasons.

Safeguard relevant information is not useful for forensics because it is not detailed enough.

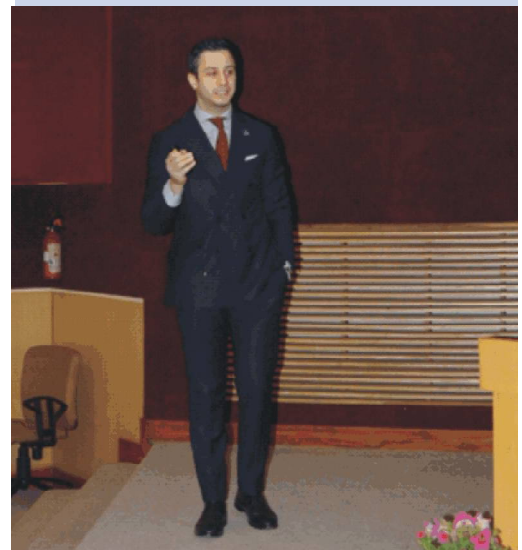
Session 3 - Nuclear Security, the Summit Process and Global Nuclear Governance



Chairperson: Dr A B Awati

Mr Luca Lentini, Project Coordinator & Research Associate, Centre for Science and Security Studies (CSSS) , King's College London

Mr Luca Lentini talked about the July 2012 incident of an 82 year old nun breaching the Y-12 national security complex in Oak Ridge to reach the uranium storage which stores 65 per cent of US nuclear material, which highlights several failures at the operator level. He said that there is a need to develop “capacity building for nuclear security and cooperation at bilateral, regional and multilateral levels for the promotion of nuclear security culture through technology development, human resource development, education, and training; and stress the importance of optimising international cooperation and coordination of assistance.” In fact, this was stated in the Communiqué of the 2010 Washington NSS. Mr Lentini told that Nuclear Security Support Centres (NSSCs) and Centres of Excellences (CoEs) are used interchangeably. In 2010, there was development of the concept of CoE. India had a similar suggestion. The NSS process facilitated the concept of COEs/NSSCs. 24 states signed the joint statement in 2012 and 31 in



The NSS process facilitated the concept of COEs/NSSCs. 24 states signed the joint statement in 2012 and 31 in 2014.

2014. The NSSCs were originally seen as a way to “pass ownership of Nuclear Security knowledge and associated technical skills to states” and to ensure sustainability. Mr Lentini further stated that the primary role of COEs/NSSCs is to facilitate the development of human resources and the provision of technical and scientific support. The IAEA developed a concept for the establishment of NSSCs. These centres are significantly different in nature. Their activities constitutes training, educational activities, focus on outreach and awareness raising activities. It facilitates regional coordination. In 2012 China, Japan and South Korea created Asian subgroup within NSSC network. It churns out a lot of information to promote regional cooperation on nuclear security. Cooperation has also been promoted at the international level under the IAEA. International Network for NSSC– has 62 NSSC institutions and 53 NSSC Member States.

Mr Lentini also discussed the International Nuclear Security Education Network - INSEN for collaboration among universities including members of nuclear security in academic curricula. India is very strongly involved in this. There are nine different Indian academic institutions being deeply involved. The INSEN network has 147 Institutions (of these 9 of are from India) and 51 INSEN Member States. The idea is to create of hub of education. The NSSC network emphasises on the sustainability, which is at the heart of the engagement strategy—mentor-protégé programme. It also places enormous emphasis on the role of human factor.

Mr Lentini also mentioned some challenges ahead such as:

- Sustainability is the key for keeping the nuclear security process on. Losing momentum will not help. Hence the NSSC and CoEs may be linked to issues of safeguards and non-proliferation.
- Enhance coordination among centres and donor is essential to ensure coordination among donors. It is also important to avoid duplication of activities and

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Sustainability is the key for keeping the nuclear security process on.

political complications.

- Quality assurance is a problem especially in areas of exchange of training programmes
- Peer-reviews must have specialised focus on particular needs

Mr Lentini further discussed that NSSCs and CoEs have played a significant role in capacity building. But the impact assessment is tricky. Can the impact be measured? CoEs should specialise in specific areas but also be able to adapt response according to emerging needs and cyber security is one such area. Bigger policy related roles for CoEs are not a good idea; it must be confined to training and educational activities. Enough financial support for maintaining the momentum must be made available.

Dr Reshmi Kazi, Associate Fellow, IDSA

Dr Reshmi Kazi stated that IAEA's IITD indicates rising figures in incidents involving unauthorised possession, theft or loss of nuclear or other radioactive materials. She said that this brings to the conclusion that nuclear security risks constitutes one of the biggest challenge of the 21st century. Nuclear security faces challenges that are essentially asymmetric and complex in nature. Substantial apprehensions exist about sensitive nuclear/radiological materials being misappropriated by terrorists. NSS held in Washington (2010) and Seoul (2012) effectively endorsed that states have a fundamental responsibility "to maintain at all times effective security of all nuclear and other radioactive materials, including nuclear materials used in nuclear weapon, and nuclear facilities under their control."

Dr Kazi told that effective nuclear security not only helps in combating the threat of nuclear terrorism but plays a pivotal role in enhancing a strong security culture. An effective nuclear security that permeates through all the agencies/departments governing nuclear security contributes in timely mitigation of the growing



Dr Kazi told that effective nuclear security not only helps in combating the threat of nuclear terrorism but plays a pivotal role in enhancing a strong security culture.

challenges to nuclear security. This is an important aspect of nuclear security. There is no room for complacency. The whole process is to be continuous and constant. India upholds this aspect when dealing with nuclear security.

Dr Kazi informed that GCNEP seeks to produce sustainable and constant improvement in nuclear security. The principal role is to improve awareness of nuclear security and non-proliferation through education, quality training programmes and technological support. It emphasises on practical training through experimental facilities. It plays a cardinal role in enhancing understanding and responsiveness to proliferation risks and consequent threats to nuclear security. She also gave more information on GCNEP.

- The GCNEP plays a crucial role in raising awareness which is an important tool while dealing with the threat of nuclear terrorism. It also facilitates conduct of degree courses in collaboration with universities that assist development of a dedicated body of technologically trained specialists for improved functioning of matters related to nuclear security. It provides regular exercises and conduct programmes to build efficient technical personnel trained to prevent potential thefts, sabotage and deal with the threat of nuclear terrorism. The GCNEP is playing its part effectively in developing a dedicated cadre of personnel who will be manned with the responsibility to take care of our sensitive installations and sensitive materials.
- GCNEP has a dedicated Outreach Programme Cell that promotes publicity of technologies developed by DAE for training in several areas like PPNM and nuclear facilities, prevention and response to radiological threats, nuclear material control and accounting practices, protective measures against insider threats. It holds regular courses, symposiums, and workshop and assist in capacity building by providing training to nuclear security professionals. The GCNEP facilitates training of Indian and international participants through international

GCNEP seeks to produce sustainable and constant improvement in nuclear security.

The GCNEP plays a crucial role in raising awareness which is an important tool while dealing with the threat of nuclear terrorism.

GCNEP has a dedicated Outreach Programme Cell that promotes publicity of technologies developed by DAE for training in several areas

seminars and group discussions by experts on topical issues. It assists development and conduct of courses in association with interested countries and the IAEA. Several training courses were undertaken both at the national and regional level.

- GCNEP thus upholds India's pledge to be a "responsible state with advanced nuclear technology" by harnessing ways to explore international nuclear best practices. It is of critical importance to reinvigorate the non-proliferation regime and heightened nuclear security. It is a signature of India's commitment to strengthen and improve nuclear security and contribute to the enhancement of the global nuclear security architecture. Cooperation on nuclear safety and security not only enhances non-proliferation and nuclear security efforts in the world, but also benefits mutual trusts and cooperation among major countries. India can justifiably take pride in its nuclear security culture, fostered by BARC Training School. The GCNEP will be India's world-class national nuclear training centre and an international resource.

Dr YS Mayya, Project Director, Global Centre for Nuclear Energy Partnership (GCNEP), Department of Atomic Energy (DAE), Government of India

Dr Y S Mayya gave a presentation about GCNEP. He told that it is an important Indian initiative to address some the issues which has limited the large scale use of nuclear energy. He raised the question: why GCNEP? His answer was because India firmly believes that the nuclear energy option is inevitable for peace and prosperity for humanity. And this is the fundamental premise of the formation of GCNEP. There is a need for international collaboration to address the residual issues like proliferation, nuclear security and nuclear safety. There is also the need for Human Resource Development (HRD) for sustaining large scale deployment of nuclear power. India has impeccable record to take leadership role in addressing these issues.

GCNEP thus upholds India's pledge to be a "responsible state with advanced nuclear technology"



There is a need for international collaboration to address the residual issues like proliferation, nuclear security and nuclear safety.

Dr Mayya said that in NSS 2010, Prime Minister Manmohan Singh announced the setting up of the GCNEP and visualised this as a state-of-art facility based on international participation from IAEA and other interested foreign partners. The centre will conduct R&D and design systems that are physically safe, secure, proliferation resistant and sustainable. India welcomes participation in this venture by countries and the IAEA. To promote this, India has taken upon responsibility to conduct R&D, and organise training and seminars for HRD and capacity building through global partnership. To achieve these goal, the GCNEP shall host the following five specialised schools:

- School of Advanced Nuclear Energy System Studies (SANESS)
- School of Nuclear Security Studies (SNSS)
- School on Radiological Safety Studies (SRSS)
- School of Nuclear Material Characterization Studies (SNMCS)
- School for Studies on Applications of Radioisotopes and Radiation Technologies(SARRT)

According to Dr Mayya, the above schools show the various aspects synergy and synthesis of important aspects for large scale deployment of nuclear energy around the world. He informed that the GCNEP also has an outreach programme as part of its perception management and educating the public at large through training courses, exhibitions, demonstrations and lectures.

- School of Advanced Nuclear Energy System Studies (SANESS) focuses on developing intrinsically safe, secured, proliferation resistance and sustainable systems including non electrical applications such as sea-water desalination, hydrogen production, district heating, and industrial heating, thorium fuel technologies which is great importance to India, accelerated subcritical systems which promise to

GCNEP will conduct R&D and design systems that are physically safe, secure, proliferation resistant and sustainable.

GCNEP also has an outreach programme as part of its perception management and educating the public at large through training courses, exhibitions, demonstrations and lectures.

School of Advanced Nuclear Energy System Studies (SANESS) focuses on developing intrinsically safe, secured, proliferation resistance and sustainable systems

mitigate proliferation concerns.

- School of Nuclear Security Studies (SNSS) deals with Formal education and training in following areas
 - a. Development of technology tools for physical security
 - b. Personnel reliability studies
 - c. Vulnerability studies
 - d. Physical Protection System analysis and evaluation tools
 - e. Nuclear security computer simulation
- School on Radiological Safety Studies (SRSS) carries out research in the field of radiological safety, impact of nuclear and radiological emergencies, and radiological impact assessment studies. It imparts training and certification of personnel including First Responders in radiation protection.
- School of Nuclear Material Characterisation Studies (SNMCS) promotes Research and Development (R&D) in nuclear material characterisation with regards to nuclear material accounting and control, education and training in effective implementation of safeguards and nuclear forensics.
- School for Applications of Radioisotopes and Radiation Technology (SARRT) enables the spin-offs and secondary benefits of nuclear technology to larger society – agriculture, industry, medical applications, radiography, nuclear medicines, food preservation and radiation medicine.

Dr Mayya also noted that the GCNEP will have central facilities for test calibration, accreditation, virtual reality laboratory for education and learning. India is about to complete Phase I in 2016. The GCNEP has been conducting its national and international programmes for the last four years in off-campus mode. To operationalise this India has entered into collaboration

The GCNEP will have central facilities for test calibration, accreditation, virtual reality laboratory for education and learning.

with governments on a firm footing. So India has MoUs with USA, Russia, France, UK, IAEA and many more are in the process. Under the umbrella of these MoUs, India has a large number of visits, training programmes and workshops jointly on nuclear security, radiological safety, accounting, faculty exchanges and so on.

Dr Mayya also informed that since 2010, India conducted several programmes with IAEA and the USA. It conducted the programme on natural circulation phenomena relating to safety of building next generation nuclear reactors. There are Programmes on thorium courses for law enforcement, and disaster management agencies. The focus of training has been extended to other stakeholders of nuclear security. Further, technical exchanges with the US, and MoUs with Kings College, UK are other features. The GCNEP is fashioning a holistic approach to global nuclear security as a comprehensive issue not by limiting but by engaging, training, equipping people, education and raising awareness and ensuring nuclear energy.

India conducted several programmes with IAEA and the USA.

Nuclear security is 20 per cent security and 80 per cent culture.

Funding for GCNEP is sufficient.

Discussions

- Nuclear security is a constant reassuring process.
- Nuclear security is 20 per cent security and 80 per cent culture.
- Funding for GCNEP is sufficient. It is fully and well funded by Government of India. It has provision for \$100 million along with additional budget for programmes for the next five years. Hence, the sustainability of India's CoE is not a matter of concern. In terms of sustainability of programmes it is driven by DAE
- Any suggestion for a Public advisory group for the nuclear centres



- India emphasises on dialogue with non-governmental experts to raise awareness about global nuclear security to assess problems and their solution
- International organisations and other governments are doing their bit to support them.
- Nuclear culture is an important part of the training programme. In the next six months, an important course on this subject will be taken up. Training people is confined to not only to technical aspect but also that of the processes involved to develop and promote a scientific culture in India
- Law enforcement agencies, first responders, doctors and technical officers are getting trained for security services
- MoUs develop linkages with international partners.



Nuclear culture is an important part of the training programme.

Law enforcement agencies, first responders, doctors and technical officers are getting trained for security services

Session 4 - Role of Civil Society in Nuclear Security



Chairperson: Ambassador NN Jha

The chair told that since the Fukushima incidents, Nuclear Security and nuclear safety are synergised in the NSS process. He asked all the speakers to focus on the role of civil society in strengthening or weakening nuclear security.

Noel Stott, Senior Research Fellow, Transnational Threats and International Crime Division (ICC), Institute of Security Studies (ISS), Pretoria

Dr Noel Stott started his presentation by stating that prevention of Proliferation of Weapons of Mass Destruction (WMD) to non-state actors is a key strategic challenge for nuclear governance. The discussion of the role of civil society in nuclear security governance is timely, and this makes the session very relevant. The NSS process has facilitated the relevance and role of civil society in securing nuclear materials. He briefly discussed about his organisation—the ISS and its work in addressing emerging threats in Africa. According to him, the idea of security means security with development. He said that the challenge before Africa is to ensure that sensitive equipment, materials and



Prevention of Proliferation of Weapons of Mass Destruction (WMD) to non-state actors is a key strategic challenge for nuclear governance.

technology transferred for development should not fall into wrong hands.

Dr Stott discussed in length about the understanding of civil society. In his view, the meaning of civil society should be private, non-profit, and voluntary. He asked to pay attention to some borderline cases. He advocated inclusion of universities, academic institutes, business NGOs and nuclear industry in the scope of civil society. The civil society, in his view, had played a significant role in making participating and host countries accountable to their commitments to nuclear security. Nuclear industry also played its role in nuclear security since 2010. However, Dr Stott cautioned that some NGOs may use the civil society to further their agenda.

Dr Stott told that the national governments acknowledge that nuclear terrorism is a problem that cannot be solved by individual states alone; this needs inputs from industry, academia, NGOs, foundations, etc. He also maintained that there is no inherent conflict between government and civil society in handling nuclear security matters. Dr Stott favoured the need for more contacts within the civil society. Stott also cautioned that transparency and security should not be treated as the two sides of the same coin.

Dr Stott argued that civil society can play a role in enhancing security culture by broadening the base of nuclear security stakeholders and may negate the impression that nuclear security is a subject of small circles of officials. Civil society may monitor assurances given by the national government. It may put the right question to the government and politicians. It may bring in new approaches, new solution, new drive and new enthusiasm. Thus, civil society may play a variety of roles, including analysing nuclear security vis-à-vis cyber security.

Dr Stott referred to the work done by King's College London regarding UNSCR 1540. He found the work exemplary. To him, some works which are not done by the national governments or even multilateral bodies

The civil society had played a significant role in making participating and host countries accountable to their commitments to nuclear security.

National governments acknowledge that nuclear terrorism is a problem that cannot be solved by individual states alone

Civil society can play a role in enhancing security culture by broadening the base of nuclear security stakeholders

because of different reasons, including the lack of human resources may be well complemented by the NGOs. He also referred to the work done by the Chatham House and Patricia Lewis relating to current practices, procedures as well as loopholes and gaps in legislation and procedures.

Dr Noel Stott also discussed the Fissile Material Working Group (FMWG) and its role in spearheading the campaign for nuclear security. The FMWG is a coalition of 81 organisational partners from around the world that are all committed to the goal of preventing nuclear terrorism. The existence of FMWG clearly demonstrated that civil society is not a marginal group in nuclear security governance. He discussed recommendations made by the FMWG, including the elimination of HEU. He, asserted, that the coalition like FMWG needs to allow some differences among its coalition partners. Dr Stott told that he does not share the recommendation of the FMWG that South Africa should renounce HEU.

Dr Paul Walker, Director, Environmental Security and Sustainability (FESS), Green Cross International (GCI), Washington DC

Dr Paul Walker discussed the role of civil society in WMD safety and security. He told that the non-proliferation of WMD has been quite contentious throughout. He said that he had been involved in the Nunn-Lugar programme. He said that Russia was encouraged to become transparent, and the on-site inspection took place. He also talked about local & regional outreach offices in Russia, Citizen Advisory Commissions (CACs) and the importance of NGOs, experts, academics, other stakeholders involvement along with governments for common goals. Dr Walker also discussed about dismantling of some of redundant Russia and the American submarines. He basically discussed about different arms control measures.

Later, Dr Walker talked about nuclear security and the FMWG. He told that he was one of the founder members of the FMWG and served on its steering committee. He

The existence of FMWG clearly demonstrated that civil society is not a marginal group in nuclear security governance.



Dismantling of some of redundant Russia and the American submarines.

told that the FMWG is going to bring around 200 experts and members of the NGOs to the 2016 NSS. The FMWG has developed videos for promoting nuclear security, and it is circulating the videos for maximum awareness. He told these videos are “Now is the Time” video, and “Welcome to the 21st Century” video. The coalition is also encouraging use of twitters as much as possible to send the message across. The media interaction is yet another tool used by the coalition to raise awareness of the issue and its various mechanisms.

Dr Walker also informed about five priorities campaign. These are: first, make the Global Nuclear Security Regime Comprehensive; second, share information to build global confidence; third, implement measurable Best Practices and Standards; fourth, create a sustainable mechanism for continuous progress; and fifth, offer plans for eliminating civil HEU and reducing plutonium. The organisation continues to focus on minimisation and elimination of weapons-usable fissile materials, achieving a comprehensive nuclear security regime and the establishment of sustainable nuclear security governance.

Dr Walker discussed five simple but relevant words: comprehensive, open, rigorous, sustainable, reduce. He told that this can be done through promotion of transparency, public dialogue, Track 1.5 & Track 2 efforts, public outreach and education, including social media. All are critical to the success of the campaign. Dr Walker elaborated Public Relations (PR) through public dialogue. In this context, he talked about DAD-Decide, Announce and Defend. He underscored the significance of power sharing in which civil society may get involved as much as possible.

Dr Walker told that the American civil society is closely working with the American President, Barack Obama, and the various nuclear departments of the US administration. Finally, he stated that Democracy is almost always messy, but produces best results. The idea behind it was to involve civil society in nuclear security governance even if the process is cumbersome.

Five priorities campaign. These are: first, make the Global Nuclear Security Regime Comprehensive; second, share information to build global confidence; third, implement measurable Best Practices and Standards; fourth, create a sustainable mechanism for continuous progress; and fifth, offer plans for eliminating civil HEU and reducing plutonium.

Five simple but relevant words: comprehensive, open, rigorous, sustainable, reduce.

Dr Rajiv Nayan, Senior Research Associate, IDSA

Dr Rajiv Nayan informed the reason for the session on the role of civil society in nuclear governance. According to him, the first reason was the 2016 Washington NSS which may turn out to be the last summit and the second, the role of civil society in global nuclear governance in particular and the global governance in general. International Relations (IR) literature underlines that it is the focus on civil society and the international expert community that makes global governance distinct from globalisation. He told that the time has come to evaluate the role of civil society for nuclear security. This evaluation could be useful in charting out the course for civil society in its future involvement in nuclear security activities.

Dr Rajiv Nayan endorsed Noel Stott's view that civil society is not a monolith group. It has entities ranging from classical NGOs to research institutes to university to industry. He also highlighted the role of the civil society in raising awareness of the mechanisms of nuclear security. Dr Nayan said by now apart from two international conventions several new mechanisms for fighting nuclear terrorism have come up. Civil society is playing its role in strengthening all the mechanisms over the years. He told that at the national level, civil society may have a coalition of different organisations doing different tasks. It may work in coordination with the government in capacity-building and exchange of information. It can also provide regulatory feedback.

Dr Nayan also discussed FMWG. He told that though it was designed as a non-hierarchical coalition of NGOs and experts from 81 organisations, yet its steering committee was basically consisting of people from Western countries, especially the US. The FMWG, in its initial years, worked hard to develop a consensus on nuclear security summit process and its various mechanisms. It was a bridge between NGOs from the developed West and not-so-developed area. However, the recent years witnessed the gap between the NGOs from the two sides gradually increasing. He said that



The time has come to evaluate the role of civil society for nuclear security.

Civil society is not a monolith group.

FMWG was designed as a non-hierarchical coalition of NGOs and experts from 81 organisations, yet its steering committee was basically consisting of people from Western countries, especially the US.

the possible end of the summit process makes a body like the FMWG more relevant for the future.

Dr Nayan also cautioned that the civil society will have to be careful about bringing out a report which may harm the cause of nuclear security instead of helping it. In this regard, he referred to the report published by Nuclear Threat Initiative (NTI). He told, fortunately, the countries and even research institutes had stopped responding to its reports, which had been generated with faulty methodology and highly subjective criteria. Multiple indicators dilute the core of the nuclear security regime. Dr Nayan pointed out that amazingly, the report admitted that researchers had lacked data because of the reluctance of several countries to supply data to it. In any research project or report, the scarcity of data is reflected on the ability of a researcher, but in the study, it gets a comical treatment. The report ranks a country on which it does not have data low. So, the conclusion is devoid of facts. Later, Trevor Findlay, in his intervention, maintained that the faulty methodology of NTI needs to be rectified. However, he suggested that intention of a person like Sam Nunn should not be doubted.

Dr Nayan recommended continuation of the FMWG with a democratised steering committee. His idea was that the representatives from the non-western societies should also be represented on it. The steering committee and the FMWG need to avoid promoting organisations, people and ideas which may bring the bridged divide back. For the purpose, there is need to separate non-proliferation and nuclear security. At the international or global level, FMWG may prove very useful in proper capacity-building, media outreach and campaign for nuclear security by other means. However, all the civil society groups ought to resolve the funding issue. Besides, he also discussed Stott's point of difference between the national NGOs and FMWG and the provision to reconcile the differences between the two levels without compromising the basic premise of nuclear security on which a consensus was arrived at in 2010 NSS.

The civil society will have to be careful about bringing out a report which may harm the cause of nuclear security instead of helping it.

The faulty methodology of NTI needs to be rectified.

All the civil society groups ought to resolve the funding issue.

Dr Bharat Karnad, Research Professor in National Security Studies (NSS), Centre for Policy Research (CPR)

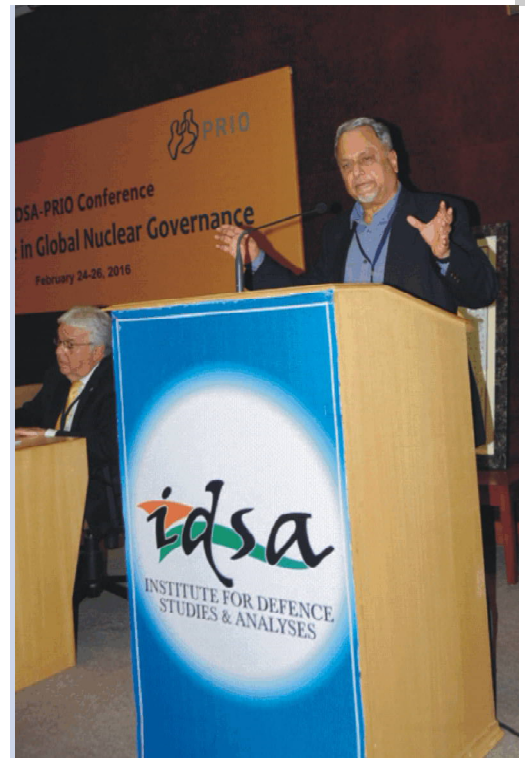
Dr Bharat Karnad maintained that there is a difference between the roles of civil society in the West and in India. In the West, the role of civil society is to restrain governments and in India, a handful of civil society groups have to campaign for national interests. He questioned mechanisms to govern in global governance. He told that on the one hand, the Western civil society talks about targeting military nuclear materials and on the other, all the P-5 countries had developed a consensus to modernise nuclear weapons and help each other in modernising nuclear weapons. He said that it is violation of articles 1 and 6 of the NPT.

Dr Bharat Karnad viewed that there is no collective interest of non-NPT countries. He took the stand that the NPT is on the way to self-destruct. The latest blow to it was given by the North Korean tests of nuclear/hydrogen nuclear weapons and ballistic missile/rocket tests. He talked about the Chinese proliferation. Dr Bharat Karnad expressed pleasure over the fact that the world is going to have the last nuclear security. He was also critical of the preference of the new generation for nuclear disarmament. However, he admitted that there is a divided consensus over nuclear issues in India.

Discussions

The session also discussed dumping of nuclear and radiological waste in the sea. The convention dealing with dumping in the sea and its membership were also discussed. The participants were of the view that international law does exist, but the challenge lies in its wider acceptance. One of the speakers pointed out that the situation in the Atlantic sea is somewhat better, but all other seas have been facing problems for decades.

Overwhelmingly, the civil society and the government of India support India's accommodation in the global nuclear governance system and the nuclear regime. India



There is a difference between the roles of civil society in the West and in India.

The situation in the Atlantic sea is somewhat better, but all other seas have been facing problems for decades.

Overwhelmingly, the civil society and the government of India support India's accommodation in the global nuclear governance system and the nuclear regime.

has stayed away from the NPT, but it never tried to destroy the NPT. This policy was reiterated several times by Indian politicians and leadership. During discussions, it was clarified that there are nuclear issues other than the NPT. The Indian Government and the civil society are deeply integrated with many of these issues. Nuclear safety, security and safeguards are the areas on which the Indian Government is quite active. India does have joint gains because of the association with the global regimes for nuclear security and safety.





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