Seminar Report

NUCLEAR TERRORISM: TRENDS AND IMPLICATIONS

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EXECUTIVE SUMMARY

Nuclear Security Summit (NSS) – India

- The Indian prime minister at the NSS mentioned that terror is a common global problem and there is a need to shy away from the idea that his terrorist is not my terrorist. He lamented that while terrorists are using 21st century technology, our responses are rooted in the past and though the problem is global, the responses are more national in nature. Important announcements made by the PM are given below.
    - India will continue to accord a high national priority to nuclear security through strong institutional framework, independent regulatory agency and trained and specialised manpower.
    - India will actively support development and deployment of technology to deter and defend against nuclear terrorism. These include physical and cyber barriers, technological approaches, setting up a facility for medical grade 'Moly-99' using Low-Enriched Uranium (LEU) and using vitrified forms of vulnerable radioisotopes such as Caesium-137.
    - India will counter nuclear smuggling and strengthen the national detection architecture for nuclear and radioactive material. A dedicated counter nuclear smuggling team has been set up.
    - India will support IAEA's central role in nuclear security by means of a contribution of $1 million to the nuclear security fund and a workshop with IAEA experts on International Physical Protection Assessment Service (IPPAS) in India.
    - India will join trilateral initiative of NSS chairs circulated at IAEA by subscribing states as the joint statement on strengthening nuclear security implementation.

- India will also join three gift baskets for this summit in priority areas of counter nuclear smuggling, nuclear security contact group in Vienna and sharing of best practices through Centres of Excellence such as India's own.
- India will host a meeting of Global Initiative to Combat Nuclear Terrorism (GICNT) in 2017. An international conference on countering nuclear smuggling is also being planned with Interpol.

Nuclear Security Summit (NSS) – Action Plan

- The future of progress made during the NSS would be through five action plans – one each for the United Nations (UN), the IAEA, the International Criminal Police Organization (INTERPOL), the GICNT and G8 Global Partnership Against the Spread of Weapons and Materials of Mass Destruction.

Important Conventions Governing Nuclear Security/Terrorism

- During the seminar, various speakers spoke of a large number of international and national conventions and acts that are governing various aspects of nuclear security and in particular nuclear terrorism. These are elucidated below.

International Conventions / Guidelines

- Convention on the Physical Protection of Nuclear Material (CPPNM) (1980) and its Amendment (2005) – IAEA.
- Information Circular (INFCIRC) 225 (1975) of IAEA and subsequent revisions–Recommendations for the Physical Protection of Nuclear Material and Nuclear Facilities.
- International Convention for the Suppression of Acts of Nuclear Terrorism (ICSANT) 2005 – UN (also called *The Nuclear Terrorism Convention*).
- United Nations Security Council Resolution (UNSCR) 1540 (2004) – United Nations: Non-Proliferation of Weapons of Mass Destruction (WMD).

National Conventions / Guidelines

- The Atomic Energy Act 1962.
- Environment (Protection) Act 1986.
- Atomic Energy (Factories) Rules 1996.
- Department of Atomic Energy (DAE) Guidelines for Nuclear Transfers (Exports) 2006.
- WMD and Their Delivery Systems (Prohibition of Unlawful Activities) Act 2005.
- Electricity Act 2003.

SESSION I

Opening Remarks by the Chair: Maj Gen Dipankar Banerjee, AVSM (Retd)

- The Chairperson stated that the subject has not found too much dialogue in the Strategic Community. A nuclear terror attack has a low probability of occurrence but is a very feasible threat and in today's unstable world with a multitude of non-state actors and state sponsored terrorists, there is a dire need for think tanks to look at this issue closely. There is a necessity to think of the consequences and impact of such an attack and the preparations required so as to ensure that the national security is not compromised.

Nuclear Material: Safety and Trafficking: Amb Sheel Kant Sharma

- The Soviet Union collapsed in the 1991 and there was a global concern that the huge nuclear arsenal should not spill over into unauthorised hands and at that time there was even a fear that a terrorist may get hold of this material.
- The international community then tried to control the tracking of nuclear material through the IAEA. The process was on for 7–8 years in bits and starts.

- The primary problem was that nations did not want too much interference from an international organisation. The IAEA was weak and it was told by various nations that there was no statute for it to interfere. A spate of incidents took place at that time in Germany and Eastern Europe about people running away from the Soviet and the newly independent states with uranium and plutonium. Individuals were caught with uranium and it created a scare. This resulted with the IAEA starting a database, called the Illicit Trafficking Database (ITDB), to track various incidents of illicit trafficking of nuclear and other radioactive materials with the aim of getting a picture of what is happening.
- In 1998, the Russians put up a resolution on suppression of nuclear terrorism. However, as the western powers had their own political agenda, there was not much support to this proposal though the issue stayed on the table of the UN General Assembly.
- The issue generated widespread concern post 9/11. There was a growing concern and anxiety that there are terrorists who are willing to pay a great cost including their life to spread terror. Till then the belief was that nuclear material is so dangerous to handle that anyone trying to handle it would first risk his own life and after 9/11 that risk element was not a deterrent.
- IAEA started work in a more systematic way and the first five-year plan was for 2002–2006. CPPNM, which is a binding agreement on all parties, was expanded and amended to add sabotage and other activities. In July 2005, a diplomatic conference was convened to amend the convention and strengthen its provisions, as a result of which it was renamed the Convention on the Physical Protection of Nuclear Material and Nuclear Facilities. The amendment has now entered into force and has adequate ratifications. It is the only convention that puts some obligations on nations.
- In 2007, the Four Horsemen of the Nuclear Apocalypse as they are called – former Secretaries of State Henry Kissinger and George Shultz, one-time Defence Secretary William Perry and former Senator Sam Nunn – wrote a series of articles where they mentioned that nuclear weapons are not a deterrent enough for

irrational people, therefore, there is a need to calibrate the theories of deterrence which cannot deal with issues related to nuclear terror and the sum total of it was that nuclear terror is a real danger as the five Nuclear Weapon States (NWS) had by then learnt to live with each other and were confident that they would be able to manage a nuclear world. The new NWS were India, Pakistan and Israel after that the main attempts were to curb North Korea and Iran, which were the emerging NWS. These nuclear anxieties were the genesis of President Obama's summitry, which started in 2010 with the aim to get global attention at the highest level. Upto 50–54 Heads of Nations participated in the summits and focus was on dangers inherent. It is to the credit of President Obama to focus on issue of nuclear terrorism and except Iran and North Korea all important stakeholders have participated in the summits.

- The last summit has emphasised that the IAEA is the central organisation, which should address this issue and be tasked to move forward. IAEA organised the first ministerial conference in 2013 and the second ministerial conference planned from December 5–9, 2016 has a major task.
- Indian actions against terror and terror conventions have not progressed much. In diplomatic arena, one needs to deal with thugs, perpetrators and those against whom terror is being perpetrated on the same table.
- US has a formidable stake and actions underway to take baby systematic steps. IAEA has taken some steps and has recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225), which is intended to provide guidance to States and their competent authorities on how to develop or enhance, implement and maintain a physical protection regime for nuclear material and nuclear facilities, through the establishment or improvement of their capabilities to implement legislative and regulatory programmes. The recommendations presented in this publication reflect a broad consensus among IAEA member states on the requirements which should be met for the physical protection of nuclear materials and nuclear facilities. It has a seal of approval from the summitry for member states to

follow and implement rationally. For example, India has accepted it as an incumbent responsibility even as part of Indo-US nuclear deal.

- The nuclear arena, thus, has put out series of guidelines. Peer review services of IAEA are part of its activities to assist member states. India has been providing experts for such peer review services.
- Radioactive materials such as cobalt and strontium can also be used in Radiological Dispersal Devices (RDDs) and terrorists can get hold of them and employ them. The irrational fears of radioactive material are so prominent that people fear the worst when they hear of radiation. Though doctors and scientists who deal with radioactive material understand the extent of likely damage, the general public does not and if an RDD was to explode in a public area, utter pandemonium will break out. The dirty bomb scare can be taken care of if the member states that have the materials enforce proper storage and denial of unauthorised access nationally in hospitals, research laboratories and universities.
- Nuclear terror danger today stems from both radioactive material and unauthorised access to nuclear weapons and fissile material which can be used for nuclear weapons.
- **Threat from Pakistan**
  - Maximum threat is from Pakistan because of the way the state is tilting towards the hands of Jihadis and even parts of the army getting radicalised towards the jihadist cause.
  - The fear is that if any radical gets control then there will be horrible consequences. However, Pakistan is loath to anyone trying to come and control access to its fissile material.
- The American TV Series "Madame Secretary" has an episode where it talks of a nuclear weapon falling in the hands of a terrorist and a Pakistani aircraft landing at Jodhpur. Thus, even popular imagination deals with this aspect.

Global Efforts in Addressing Nuclear Terrorism: Mr Dipanjan Roy Chaudhary

- Global issues need global solutions and nuclear terrorism is one such issue. The implementation on various issues by the members of the UN has been at level of talks and not much action.
- After terror attack in Paris and Brussels, Europe and the world community has united in its efforts to deal with jihad and manifestations.
- President Barack Obama started Nuclear Summit series in 2010. Russia did not attend due to a downturn in its relations with the USA.
- Iran was also not invited to attend the summit. It is important to involve emergent nuclear powers/aspirants and second powerful nation militarily also needs to be involved in the process and their non-attendance was in some ways a blow to the anti-nuclear terror efforts. President Putin in last two years has charted his own path in world geopolitical affairs.
- Closer home, Pakistan has the record of being the world's worst offender in nuclear proliferation over Libya, North Korea and even Saudi Arabia. The recent missile tests by North Korea have generated news of re-emergence of an axis between North Korea and Pakistan and some material may have been transferred from North Korea to Pakistan.
- Pakistan Prime Minister shied away from attending the NSS 2016 at the last moment with the unsaid worry being that it may be named, if not shamed, as the worst proliferator of nuclear terror.
- The United States, Europe and India face the chilling danger of nuclear terror from IS and/or its affiliates. Two of the terrorists in Brussels terror attacks had also set eyes on a probable nuclear terror attack on a nuclear power plant and there could have been catastrophic results had they succeeded.
- While nuclear weapons may not be prevalent worldwide, due to the nuclear power stations, nuclear safety and safety of fissile material is very critical.

- The Indian PM at the NSS mentioned that terror is a common global problem and there is a need to shy away from the idea that his terrorist is not my terrorist. He lamented that while terrorists are using 21st century technology our responses are rooted in the past and though the problem is global, the responses are more national in nature.
- Rajiv Gandhi, in a speech made in 1988, had also alluded to the growing threat of nuclear proliferation and nuclear terror. India needs to keep a close watch on Pakistan and the growing instability there as Pakistan has always brandished its nuclear weapons as a part of its deterrence policy.
- In the NSS, President Obama pointed out that the chances of terrorists getting hold of a minor nuclear weapon or fissile material cannot be ruled out. The NSS has been universally acclaimed worldwide.
- India is situated in one of the most violent areas in the world and hence needs to ensure that its security concerns are addressed adequately. To conclude, a global effort across nations and coherent implementation of policies is much needed to deal with this real and vexing issue of nuclear terrorism.

SESSION II

Opening Remarks by the Chair: Maj Gen PC Kharbanda, AVSM, SM (Retd)

- On the issue on nuclear terrorism, it is important to look at Pakistan and the policy of Islamisation of the Pakistani Army that was started by Gen Zia and the people who were then inducted are today occupying very high positions of power in the Pakistani Armed Forces.

Modelling Nuclear Terror Strategy: Likelihood and Counter Measures: Dr Rajeswari Rajagopalan

- Nuclear terror is an important area of concern for any nation and a part of it national security narrative.
- But in India it has not been talked about too much for two reasons—one that people are not comfortable talking about it and two that the atomic energy establishment in India has chosen to remain opaque and not talk about it in an open manner. As such most of the work in this field is more in theory. There are signs that

the Indian atomic establishment has started talking about issues, though in a controlled manner.

- The issue of nuclear terror has been on for a while sometime particularity after the Cold War ended as there was a realisation that some of the weapons may land up in the hands of terrorists. But even then the attention to the issue at the global level was minimal and it gained greater traction after the 9/11 attacks and global powers began to pay attention to the issue of nuclear terrorism.
- The worry with regards to nuclear terror is very real as indicated by the ITDB of IAEA which indicates that in the period 1993 – 2013 there have been about 2,500 incidents related to theft and/or illegal possession of nuclear materials. These are only the reported incidents, the real numbers could be much more. Thus, the threat is very live and every security agency must be alive to this problem.
- There have been no real indicators of a terrorist group trying to gain a nuclear weapon, but that does not give us the luxury of thinking that it would never happen. While the likelihood may be small, the disastrous impact that a nuclear terror might have makes it imperative that the issue is tackled seriously.
- The reason why terrorists have not pursued this needs to be understood. The reasons could be financial, political and also logistical. In addition, the nuclear taboo is also a factor. Since the United States employed nuclear weapons in 1945, no country has thought of usage of a nuclear weapon. There is an unestablished norm on non-use of nuclear weapons. This taboo also probably has been in the minds of the non-state actors. But again, this does not give us an assurance that such an incident may never happen.
- The various ways of attaining a nuclear device could be build, buy, steal or maybe gain control of a nuclear facility. Each of these processes have different levels of difficulty in execution. Even for a nation to pursue the goal of attaining a nuclear weapon is very difficult and India is a good example of dealing with sanctions etc. post 1974. The fundamental difference between a nation and a terrorist lies in the fact that while a nation is looking for a full-fledged nuclear arsenal and infrastructure, the terrorist is looking

for a single weapon which may not be entirely difficult if they want to pursue it and existence of AQ Khan-like networks give more credence to this issue.

- The seriousness of the likely damage in case of a nuclear terror incident demands that the civil nuclear facilities and the nuclear arsenal be very well protected and most nations are alive to this fact. The facilities are heavily guarded with electronic locks and in most cases the weapons are in a de-mated state making the unauthorised use a nuclear weapon very difficult even if someone is to break into the facility. However, a full-fledged nuclear weapon does not have to be used and there are variants that can be used such as RDD or a suitcase bomb or attack on a nuclear facility to cause nuclear contamination. There have been reports after 9/11 that Al-Qaeda apparently had plans to crash one of the passenger jets into a nuclear facility. Therefore, the scenarios have been there in the minds of the terrorists but have not been implemented due to various reasons. If one takes a look at the more established terror groups say Hamas or LTTE, which had a parallel government functioning, the reason why they have not pursued the nuclear terror angle is due to likely hurt to their political causes and they could lose social support and support among the local population. So the reasons for a terrorist group not acquiring a nuclear weapon have been more political and not logistical or financial. But then there are groups such as Al-Qaeda and ISIS who are more apolitical in nature and are not associated with or rooted in a particular country or region. This could give them a much more free hand in contemplating the use of nuclear weapons as a tool of terror and be not concerned about the consequences. Therefore prevention, security and counter response become the key factors for any government when they talk of this issue.

- Having a look at the terror threats that India is facing, there is Left Wing Extremism (LWE) and separatist insurgency and terrorism which is state sponsored from across the border. In addition, there are also newer threats in terms of an insider threat aided by an external agency. There are terrorist groups that are executing much better coordinated attacks such as the Mumbai terror attacks by

the LeT. In addition, the neighbourhood has problems of a failing state with a weak leadership and a military-dominated Military-Civil relationship. All these issues have resulted in a complex security scenario for India.

- So far, there has been no attack on any nuclear facility in India. In a study done last year, an interaction was carried out with Atomic Energy Commission (AEC) and other agencies such as Central Industrial Security Force (CISF), intelligence agencies and state police. One of the issues brought out by the AEC was the fact of no attack on a nuclear facility in India, which is a positive sign. Recently, the terror attack in Pathankot did show some vulnerabilities existing on the Indian side and the fact that the attack was on a well-guarded frontline base did show that there could be vulnerabilities that could be exploited by terror groups. Therefore, we cannot sit in comfort that if there has been no attack thus far on a nuclear facility, there can be none in future.

- In our neighbourhood, both Pakistan and Bangladesh have problems. The growing number of radicals in Bangladesh, which is otherwise a moderate Islamic country, is a matter of concern and has resulted in a number of terror attacks and we need to take note of that. ISIS has not shown any presence as yet in either of the countries but its presence in future cannot be ruled out. Recently, ISIS has released a video in which they said they are looking for Indian fighters and are already training fighters from Pakistan and Bangladesh. So, will Indian Mujahideen (IM) be that conduit for ISIS? There is a need to keep looking at possibilities for such collaborations and ways to negate them. In 2013, there was news from Surat that the IM was planning to strike at a nuclear facility.

- Pakistan has been exporting terror to India but has itself also been affected adversely by it. As far as attacks on nuclear facilities / nuclear related facilities go, the November 2007 attack on Sargodha Airbase, August 21, 2008 attack by Tehrik-e-Taliban Pakistan (TTP) on Ordnance Factory in Wah, October 2009 Army General Headquarters (GHQ) in Rawalpindi and May 2011 attack on PNS Mehran. All these establishments have either nuclear storage or related assets located there. The inclination of terrorists to enter

high-value targets has been very clear. Therefore, changing the theatre of operations to India is not very difficult although there are restrictions, the borders are also porous thereby facilitating trans-border movement.

- The reason why nuclear terrorism is in discourse is because 3.6 percent of India's electricity is generated from nuclear power and after the Indo-US nuclear deal, the nuclear sector is likely to grow in a big way so that the nation has a wider base for meeting its energy security needs. This growth may lead to greater private sector participation and there might be a concern as to how security-related rules and regulations are enforced in private sector facilities, which needs to be carefully taken care of.

- So in order to effectively deal with the threat the three key words are – detect, prevent and effectively respond. Prior to the NSS, the Ministry of External Affairs (MEA) has come out with a document which lists out the five elements of India's approach to nuclear security – Governance, Nuclear Security Practice and Culture, International Cooperation, Technology and Institutions. All these issues are important to ensure setting up of a proper security infrastructure.

- The Atomic Energy Act 1962 is an umbrella act which encompasses nuclear security in India. Subsequently, there have been newer regulations and amendments that take care of the changing environment. In addition, there are other regulations that also deal with this issue such as Environment (Protection) Act 1986, Atomic Energy (Factories) Rules 1996, Electricity Act 2003, DAE Guidelines for Nuclear Transfers (Exports) 2006 and WMD and Their Delivery Systems (Prohibition of Unlawful Activities) Act 2005. These give out the responsibilities of various agencies and the Atomic Energy Regulatory Board (AERB) which is the auditor and regulator for nuclear facilities in India. In addition, there is a controlled list of nuclear materials. All the regulations and lists have been constantly updated particularly as a part of India's efforts to join the Nuclear Suppliers Group (NSG). Thus, the Indian Government has made multiple efforts to secure nuclear materials. Even before 9/11, India has been a victim of terrorism

and so the security consciousness on all issues including nuclear has been high in India.

- One of the criticisms, in India and abroad, in the global community against India has been the nature of the nuclear regulator, that is, the AERB, its independence or autonomy. The Nuclear Safety Regulatory Authority (NSRA) Bill, 2011 was languishing in parliament for a long time and has now lapsed and needs to be reintroduced in Parliament. Though the NSRA is a big step, there is criticism to the degree of autonomy given in it. India invited the IAEA Chief to India to study safety and regulatory practices and so the Integrated Regulatory Review Service (IRRS) Mission came into picture in March 2015. The mission came out with a report that the Indian regulator AERB and DAE need to be separate under one regulator. Though India has not had a nuclear accident such as in Fukushima, it does not mean that the country should wait for some event to form an independent regulator. Another issue pointed out was nuclear security culture. The most important link is the person operating in the nuclear facility. The human element is more important due to the insider threat. The Indian system has a Personal Reliability Program (PRP) that is carried out by intelligence agencies in conjunction with civil police.

- One more problem is that India has not talked about its successes. A recent interaction with the French indicted that they were not aware of the depth of the Indian PRP. The PRP is a very successful long-running programme where in an in-depth analysis of a person (social, medical, financial and physical background) is carried out over a period of 6–8 months. Subsequently, there is a review carried out after two odd years or when the person has to move to a higher appointment or a new nuclear facility. The Design Basis Threat (DBT) is adopted in each plant and forms the basis of threat assessment to each plant and is carried out when the power plant is first made operational. The DBT is also reviewed regularly to analyse the gaps. An important issue is security and availability of material. There are some weaknesses such as the incident in Mayapuri in April 2010, wherein an Atomic Energy of Canada Limited (AECL) Gammacell 220 Research Irradiator

which contained Cobalt-60, owned by Delhi University, was sold in an auction to a scrap dealer. Eight people were hospitalised as a result of radiation exposure, where one later died. The reaction of the first responder's that is, the doctors was not adequate until one doctor from National Disaster Management Authority (NDMA) pointed out to the nature of the problem.

Indian Nuclear Security Apparatus: Countermeasure for Nuclear Terror Attack: Dr Reshmi Kazi

- If we glance at the figures given in ITDB 2016 of the IAEA, it comes out that the figures have been on the rise. This is actually a watershed period for India as regards the nuclear security arena as not only is the threat considered to be more real but there is so much happening in the global community and in India and nations recognising their national and international responsibilities. The NSS process has recently gotten over but it will not end and will be taken forward in a sense because of the gift baskets that have come up such as the Nuclear Security Implementation Limits.
- Although there have been lot of efforts in the area of nuclear terrorism, the threat has remained undiminished as there are people who have a malicious agenda to get their hands on radioactive material. There is an opinion that after the demise of Osama Bin Laden the threat has come down as it has been documented that the Al-Qaeda chief had said that it is their religious duty to acquire a nuclear weapon.
- In this regard, India does have a roadmap to improve nuclear security. Nuclear security could primarily be defined as "The prevention and detection of and response to theft, sabotage, unauthorized access, illegal transfer or other malicious acts involving nuclear material, other radioactive substances or their associated facilities" and India's approach to nuclear security has five basic elements – Governance, Nuclear Security Practice and Culture, International Cooperation, Technology and Institutions. The action on these issues is apparent in the form of India's state responsibility, legislative and regulatory framework, criminalisation of offences, detection and response mechanisms and contribution to a nuclear security regime.

- India looks at nuclear materials primarily as a source for meeting a part of its requirements for electricity and energy and savings. This does not, however, imply that the nation does not have a strategic programme. The strategic programme exists but nuclear weapons are not thought of as a tool of war fighting but as a political instrument.

- India has already accepted the 13 universal instruments to combat international terrorism. These instruments are benchmarks for a state to combat terrorism. It is a party to the CPPNM and ratified the 2005 Amendment to the CPPNM and a party to ICSANT 2005, which are important tools in combating nuclear terrorism and are benchmarks in a nation's commitment to counter nuclear terrorism. The Atomic Energy Act of 1962 also lays out the rules regarding safety and security of sensitive nuclear installations and radiological materials. Further, the act stipulated that all agencies dealing with nuclear material will strictly adhere to the guidelines of the AEC. In addition, the Nuclear Control and Planning Wing (NPCW) of the DAE was created in 2013 to integrate DAE safeguards, export controls and nuclear security related activities. AERB has issued a manual giving detailed nuclear security requirements for nuclear power plants.

- To take care of the cyber threats, the Computer Information and Security Advisory Group (CISAG) provides extensive protection against threats from the information technology and cyber domain. The CISAG has developed systems to take care of cyber threats to nuclear security. In addition, India also has the Crisis Management Group (CMG) which has been entrusted with the responsibility to inspect the information concerning radiological disasters and incidents.

- India has made efforts to join the NSG and expressed desire to be a part of the existing control regimes to strengthen the non-proliferation objectives and contribute to robust nuclear security architecture. India also joined the Missile Technology Control Regime (MTCR), recently. The WMD Act symbolises India's commitment to non-proliferation and is in sync with the UNCSR 1540 which aims at non-proliferation of WMD.

- India also has also set up a dedicated Counter Nuclear Smuggling Team, which is a coordinated monthly multi-agency approach that has been set up to deal with groups or individuals that may acquire radiological material for any malicious purposes. The threat of nuclear terrorism is very real and to that extent the AERB provides with robust safeguard measures. These measures were also reviewed by the IAEA IRRS Mission in March 2015. The IRRS team recognised that the AERB continues to update its regulatory requirements and encouraged the AERB to further enhance its regulatory framework. The National Investigation Agency (NIA) Act 2008 enabled setting up of a counter terrorism investigation agency at the national level.

- There are efforts underway to convert Highly Enriched Uranium (HEU) to LEU to prevent the illicit use of weapon grade fissile material. The Canadian-Indian Reactor Uranium System (CIRUS) that was using HEU was shut down in 2010 and planned replacement reactor will not use HEU. India is setting up a facility for the production of medical grade Molybdenum Mo-99 by the uranium fission route using LEU targets. Pursuit of a closed fuel cycle and the manner in which India goes about it further ensures security of nuclear materials.

- India has a network of 23 Emergency Response Centres (ERC) which are connected to the Indian Environmental Radiation Monitoring Network (IERMON). There are radiation portals and detection equipment for maintaining vigilance on passenger vehicles and cargos being transported across major ports. The number of ERC is likely to increase to 30. As on April 2014, the IERMON has 410 monitoring systems at 80 locations (cities/towns) across the country. Inputs from the IERMON are fed to the ERCs for a suitable response in case of any contingency.

- Nuclear security is not feasible by actions of any one nation and international cooperation is an essential aspect of this. India has acknowledged that there is a need for sharing of best practices, training and expertise to broaden the awareness about nuclear threats. The Global Centre for Nuclear Energy Partnership (GCNEP) has a wide ranging curriculum on a host of nuclear

security issues such as insider threat, vulnerability assessment, transportation security, cyber security, detection, prevention and response to radiological threats and has imparted training and conducted more than 30 international and regional programmes involving more than 300 participants from around 30 countries. India has supported IAEA for the fifth revision of the document on nuclear security recommendations, INFCIRC/225 which provides guidance on how to develop or enhance, implement and maintain a physical protection regime for nuclear material and nuclear facilities. India is a participant in the IAEA's Incident and Trafficking Database (ITDB) and has voluntarily adopted the provisions of the IAEA Code of Conduct on the Safety and Security of Radioactive Sources. IAEA has carried out review of Indian Pressurised Heavy Water Reactors under the Operational Safety Review Teams (OSART) mission. India contributed US$ 1 million to IAEA's Nuclear Security Fund in 2013 and proposes to contribute a similar amount in 2016 as well. India made a voluntary contribution of US$ 100,000 in 2015 for the modernisation of IAEA's nuclear applications laboratories in Seibersdorf, Austria under the ReNuAL project. India is a Party to the GICNT and has contributed in all three working groups of the GICNT in the areas of nuclear detection, nuclear forensics and response and mitigation. India plans to host a meeting of the working groups of the GICNT in India during 2017.

- Some pathways to counter a nuclear terror threat are as follows:
  - People on the borders are deprived most of the times of basic amenities. They form the second line of defence after the Indian army and must be adequately cared for so that they do not turn to pathways across our porous borders.
  - India does have sophisticated detection architecture but a lot more needs to be done to further revamp the detection architecture and needs to be upgraded with the latest technological advances. Drones, for example, can be employed. Though drones cannot carry very heavy sensors there are some light sensors that can be operated by using a drone.

- There are 17 nations in Asia which deal with nuclear weapons or technology or materials. There is a need to have a mechanism to work out collaboration between various centres of excellence amongst these countries. Though there may be serious political differences between nations, centres for excellence being apolitical in nature can collaborate and greatly help in the field on nuclear security.
- There is also a need to publish white papers and reports to showcase efforts being made by India in the nuclear security field. A report on the issue was published by the MEA in 2014.

CONCEPT NOTE

Overview

- Nuclear terrorism is often downplayed by scholars and experts as a minimal threat to international security. This sense of complacency derives, in part, from the historical absence of a nuclear terrorist incident. Further resistance to the notion of nuclear terrorism may also stem from wishful thinking and the hope to avoid the fear and anxiety generated by nuclear terrorism may lead to its being cast aside as highly unlikely. Critics of those who propose the plausibility of nuclear terrorism often argue that the use of nuclear weapons is inconsistent with or disproportionate to terrorist goals.
- Nuclear terrorism was and still is a major concern in our world today. Nuclear terrorism can destroy a country, nation, continent, or maybe even the world, and this problem has to be stopped or there can be an unpreventable catastrophe. Although there is huge concern regarding nuclear proliferation with respect to states, many people contend that nuclear weapons and materials remain inaccessible to terrorists.
- In addition to the immediate horrific devastation, such an attack could cost trillions of dollars in damages, potentially sparking a global economic depression.
- Despite several international and US-led programmes to secure nuclear weapons and the materials to make them, major gaps in policy and its implementation remain.

Important Issues Meriting Attention

- **Fissile Material: Safety and Trafficking** – Safety of fissile material is the most important subject related to nuclear terror as it forms the basis of any act of terror. In addition, various radiological substances can be also employed by a terror group as a RDD and since they are widely used in industrial and medical arena, their safety is also of prime concern. There have been several instances

of illicit trafficking and hence fissile material security, an analysis of some recent incidents of theft/trafficking and global efforts to curb the menace needs comprehensive consideration.

- **Global Efforts in Addressing Nuclear Terrorism** – There are many international forums and organisations that are grappling with this vexing problem. In addition, there are various think tanks that are also analysing this issue. The efforts of these organisations and a comprehensive action plan by various nuclear material holding nations is imperative to deal with this problem.

- **Modelling Nuclear Terror Strategy: Likelihood and Counter Measures** – The main threats of a nuclear terror attack could be a nuclear explosive device – theft of device or theft of material to make a device, RDD – theft of radioactive material or sabotage for dispersal – attack on a nuclear facility/location or transport. There have been many inputs by global terror groups such as Islamic State who have proclaimed possession of fissile material recently and Al-Qaeda in the past. An analysis of the terror groups and their capabilities including lone wolf attacks would assist in a thorough analysis of the envisaged threat and modes of attack. This will assist in preparation of plans to negate a nuclear terror incident and in case of an attack mitigate its after effects.

- **Indian Nuclear Security Apparatus: Countermeasure for Nuclear Terror Attack** – India has a well-established nuclear structure for civilian and military uses. Due to the terrorism issues that the nation is contending with on a daily basis, it is important to understand the importance of having a viable apparatus to deal with an act of nuclear terror. It is, thus, imperative to analyse where we stand now and have an action plan and resources in place to deal with any incident. The analysis will also throw up existing shortcomings, if any and recommendations to overcome them.

Objective of the Seminar

- The objective of the seminar is to analyse the growing threat of nuclear terrorism, global actions taken to mitigate it and implication for security planners and executors to deal with the threat.