



A FORTNIGHTLY NEWSLETTER ON NUCLEAR DEFENCE, ENERGY AND PROLIFERATION FROM
CENTRE FOR AIR POWER STUDIES

Vol 10, No. 12, 15 April. 2016

REPORT – Government of India

India's National Progress Report, Nuclear Security Summit 2016

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 is engaged in developing nuclear technologies for deployment. Continuous evolution of the framework for governance of nuclear power including that for nuclear security has been given equal importance. Nuclear industry and research centres in India have internalized security practices in their day-to-day working and have created a strong security culture in their respective organizations. In tune with the security requirements as perceived by India, the nuclear security architecture in the country has been strengthened and India has also participated in strengthening security architecture at the global level. Considering that it is the last nuclear summit in the current format, a consolidated report on nuclear security is presented here.

International Legal Instruments: India is party to all the 13 universal instruments accepted as benchmarks for a State's commitments to combat international terrorism. India is party to the

Nuclear industry and research centres in India have internalized security practices in their day-to-day working and have created a strong security culture in their respective organizations. In tune with the security requirements as perceived by India, the nuclear security architecture in the country has been strengthened and India has also participated in strengthening security architecture at the global level.

CONTENTS

- ☛ REPORT
- ☛ STATEMENT
- ☛ OPINION
- ☛ NUCLEAR STRATEGY
- ☛ NUCLEAR ENERGY
- ☛ NUCLEAR COOPERATION
- ☛ NUCLEAR NON-PROLIFERATION
- ☛ NUCLEAR PROLIFERATION
- ☛ NUCLEAR SAFETY
- ☛ NUCLEAR SECURITY
- ☛ NUCLEAR DISARMAMENT
- ☛ NUCLEAR TERRORISM
- ☛ URANIUM PRODUCTION
- ☛ NUCLEAR WASTE MANAGEMENT

Convention on the CPPNM and has ratified its 2005 amendment. India looks forward to its early entry into force. India is also party to the International Convention for the Suppression of Acts of Nuclear Terrorism. India supports efforts for promoting the universality of these two conventions.

National Legal and Implementation Framework: The Indian Atomic Energy Act, 1962 provides the legal framework for all aspects related to development of nuclear and radiation technologies including their security. Rules and guidelines issued under this Act include those related to export controls, which are continuously updated, and include controls on

export of related technologies. Guidelines have also been issued to ensure that companies manufacturing nuclear equipment based on any imported technology handle the technology with due sensitivity. India's export controls list and guidelines have been harmonized with those of NSG and India looks forward to strengthening its contribution to shared non-proliferation objectives through membership of the export controls regimes. In 2005, India enacted the Weapons of Mass Destruction and their Delivery Systems Act, 2005. This gives effect, inter alia, to India's obligations under the UNSC Resolution 1540.

Institutionally, the security of nuclear and radiological material in India is ensured through robust oversight by India's AERB, which deploys a large pool of highly trained and specialised manpower for this purpose. IAEA's peer review mechanisms like the Integrated Regulatory Review Service (IRRS) have acknowledged the strength of AERB's regulatory practices and capabilities. At the same time, steps are being taken to convert the de facto independence of AERB into de jure autonomy through a Nuclear Safety Regulatory Authority (NSRA), for which a bill is being finalised for introduction in the Indian Parliament. The draft bill has appropriate provisions related to national implementation of nuclear security. The Unlawful Activities (Prevention) Act, 1967 was amended in 2012 to include offences within the scope of, and as defined in several treaties including CPPNM. The National Investigation Agency (NIA) Act, 2008 establishes a central agency, the NIA, which acts as the central counter terrorism law enforcement agency. The schedule of this Act has reference to the Atomic Energy Act, the Unlawful

IAEA's peer review mechanisms like the Integrated Regulatory Review Service (IRRS) have acknowledged the strength of AERB's regulatory practices and capabilities. At the same time, steps are being taken to convert the de facto independence of AERB into de jure autonomy through a Nuclear Safety Regulatory Authority (NSRA), for which a bill is being finalised for introduction in the Indian Parliament.

The Nuclear Controls and Planning Wing set up in the DAE in 2013 has taken robust strides towards implementation of India's commitment related to nuclear safeguards, export controls and nuclear safety and security. Other agencies housed in the DAE and having a role in nuclear security include a Crisis Management Group (CMG) and a Computer Information & Security Advisory Group (CISAG).

Activities (Prevention) Act and the Weapons of Mass Destruction and their Delivery Systems (Prohibition of Unlawful Activities) Act. The Nuclear Controls and Planning Wing set up in the DAE in 2013 has taken robust strides towards implementation of India's commitment related to nuclear safeguards, export controls and nuclear safety and security. Other agencies housed in the DAE and having a role in nuclear security include a Crisis Management Group (CMG) and a Computer Information & Security Advisory Group (CISAG). At the national level, the NDMA, an agency with manpower trained to respond to emergencies including radiological emergencies, has been set up through an Act of Parliament.

Setting up of an Inter-ministerial Counter Nuclear Smuggling Team: To devise a coordinated multi-agency approach to deal with the threat of individuals or group of individuals acquiring nuclear or radioactive material for malicious purposes, India has set up at the national level an institutional mechanism called a Counter Nuclear Smuggling Team. The team has representation from concerned Ministries/ Departments/ Agencies and meets frequently. It also conducts table top exercises for effective and coordinated response to threats involving use of nuclear and radioactive material for malicious purposes.

Nuclear Material: The use of LEU instead of HEU to preclude the threat from the misuse of HEU is one of the aims of the global nuclear security community. The only reactor in India using HEU has been shut down and the planned replacement reactor will not use HEU. India is setting up a facility for the production of medical grade Mo-99 by the uranium fission route

using LEU targets. This will be used for the manufacture of Mo-99/Tc-99m generator for use in hospitals. The LEU targets will be made in India and irradiated in an indigenous research reactor. Pursuit of a closed fuel cycle and the manner in which India goes about it further ensures security of nuclear materials. India is strictly observing the principle of "reprocess to reuse" whereby reprocessing of the spent fuel and commissioning of fast reactors are being synchronized to preclude any build-up of a plutonium stockpile. Cs-137, a useful isotope, is being recovered from the high level waste arising from reprocessing spent fuel from thermal reactors. This is helping to meet the demand of radioisotopes for various applications. India has submitted proposals in the NSS process on the technology dimension of nuclear security.

Security of Radiation Sources and Facilities: India's regulatory agency, the AERB, has instituted very robust regulatory mechanisms to ensure safety and security of radiation sources from 'cradle to grave'. AERB has published two Guides on: (i) Security of Radioactive Sources and radiation Facilities (AER/RF-RS/RG1) and (ii) Security of Radioactive Material during transport (AERB/NRF-TS/SG-10). In addition, AERB has developed a database of radiation sources utilized in the country and recently instituted a very successful e-LORA (e-licensing of Radiation Applications) platform for complete automation and facilitate end-to-end licensing of facilities using radiation sources. Security of high activity sources during their transport are ensured by implementing elaborate security plan including continuous and real time tracking. AERB is also regularly conducting awareness programmes for various stakeholders/ law enforcement agencies for security of radiation sources throughout the country.

SNM Detection Architecture: A network of 23 Emergency Response Centres, spread across India has been developed for detecting and responding to any nuclear or radiological emergency, anywhere in the country. All major sea ports and

airports of the country are being equipped with radiation portals & detection equipment to monitor all vehicular, passenger and cargo traffic.

Cyber Security: Addressing the growing challenges of threats to computer, network and information systems is a national priority. Utilizing the extensive expertise available in the country, a hierarchy of on-site Cyber security architecture has been deployed and also a number of sophisticated products and services like secure network access system (SNAS) have been developed and deployed for protection of the cyber infrastructure in the country.

Strengthening International Cooperation: India had announced setting up of a GCNEP during the NSS 2010 held in Washington D.C. The uniqueness of GCNEP rests on its holistic vision of nuclear energy through its five schools on (i) advanced nuclear energy systems, (ii) nuclear security, (iii) radiological safety, (iv) nuclear material characterization, and (v) applications of radioisotopes and radiation technologies, each specializing in an area that promotes an overarching vision of safe, secure and sustainable nuclear energy for global good. GCNEP has inked MOUs with IAEA, USA, France, Russia and UK For more than five years now,

A network of 23 Emergency Response Centres, spread across India has been developed for detecting and responding to any nuclear or radiological emergency, anywhere in the country. All major sea ports and airports of the country are being equipped with radiation portals & detection equipment to monitor all vehicular, passenger and cargo traffic.

GCNEP has been steadily strengthening its portfolio of programmes and has conducted more than 30 international and regional programmes involving more than 300 participants from around 30 countries.

Important and emerging nuclear security topics like insider threat, vulnerability assessment, transportation security, cyber security, detection, prevention and response to radiological threats etc. have been covered in these programmes. International cooperation also includes cooperation at the level of NGOs and a recent example includes a conference on India's Role in Global Nuclear Governance organized during 24-26 February 2016 jointly by IDSA and Peace Research Institute, Oslo (PRIO). Earlier, a workshop on technical aspects of civilian nuclear security

was held jointly with the US National Academy of Sciences by the National Institute of Advanced Studies, Bengaluru on October 29-31, 2012.

IAEA: India has consistently supported the IAEA's central role in facilitating national efforts and fostering effective international cooperation to further strengthen nuclear security.

Indian experts have been participating in various bodies established by the IAEA to draft and review documents related to nuclear security. India has supported the fifth revision of the document on nuclear security recommendations, INFCIRC/225, and included a reference to it in its nuclear cooperation agreements where applicable. India is a participant in the IAEA's 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 PHWRs under the "Operational Safety Review Teams" (OSART) mission. Additionally IAEA has conducted the "Integrated Regulatory Review Service" (IRRS) review of India's regulatory agency, the AERB.

India will propose a workshop on IAEA's International Physical Protection Advisory Service (IPPAS) with the Agency experts during the year 2016. India participated at the Ministerial level in the International Conference on Nuclear Security organized by the IAEA in 2013 and plans to participate at the appropriate level in 2016 as well. India also participated in the December 2012 Fukushima Ministerial Conference on Nuclear Safety. India contributed \$ 1 million to IAEA's Nuclear Security Fund in 2013 and proposes to contribute a similar amount in 2016 as well. In addition, India made a voluntary contribution of US\$ 100,000 in 2015 for the modernization of IAEA's nuclear applications laboratories in Seibersdorf, Austria under the ReNuAL project.

United Nations and other Mechanisms: India fully

supports the implementation of UNSC Council Resolution 1540, its extension resolution 1977, and the United Nations Global Counter Terrorism Strategy. India hosted, along with the UN Office for Disarmament Affairs, a 1540 Workshop on Building New Synergies on Nuclear security in New Delhi in 2012. India is a Party to the GICNT and participates in

all three working groups of the GICNT in the areas of Nuclear Detection, Nuclear Forensics, and Response and Mitigation. India has proposed to host a meeting of the working groups of the GICNT in India during 2017. India will join the Joint Statement on Strengthening Nuclear Security Implementation circulated at the IAEA as INFCIRC/869.

Source: <http://www.mea.gov.in>, 02 April 2016.

STATEMENT – IAEA Director General

Excellencies, Ladies and Gentlemen, The IAEA has been active in nuclear security for decades. After the 2001 terrorist attacks in the United States, we significantly stepped up our activities.

The first Nuclear Security Summit six years ago had a major impact on our work. In 2010, some countries still questioned whether the IAEA had a mandate to work on nuclear security. Now, no-one disputes this. Today, nuclear safety and security are priority areas in the IAEA budget. Our

regular budget for nuclear security has increased five-fold, but it is still not sufficient.

The 2010 Summit set out a far-sighted programme to improve nuclear security. The IAEA has played the leading role as the global platform for strengthening nuclear security, and we

have delivered concrete results.

Since 2010, the IAEA has trained over 10,000 people in nuclear security, including police and border guards. We have given countries more than 3,000 instruments for detecting nuclear and other

IAEA has carried out review of Indian PHWRs under the "Operational Safety Review Teams" (OSART) mission. Additionally IAEA has conducted the "Integrated Regulatory Review Service" (IRRS) review of India's regulatory agency, the AERB.

Since 2010, the IAEA has trained over 10,000 people in nuclear security, including police and border guards. We have given countries more than 3,000 instruments for detecting nuclear and other radioactive material, and carried out around 60 advisory missions to help States improve their nuclear security frameworks.

radioactive material, and carried out around 60 advisory missions to help States improve their nuclear security frameworks.

We maintain a unique global Incident and Trafficking Database, through which 133 countries report incidents of illicit trafficking and other unauthorized activities involving nuclear and other radioactive material. Nearly 3,000 such incidents have been reported since the database was established in 1995.

States should make better use of this database and report all relevant incidents in order to improve everyone's understanding of the scale of the problem. Countries all over the world have invested in nuclear security, often with support from the IAEA and financial assistance from some of the countries. We work closely with the more than 100 other IAEA Member States which are not represented at this Summit meeting.

Ladies and Gentlemen, Protection against possible nuclear terrorist attacks will be enhanced as an important legal instrument — the Amendment to the Convention on the Physical Protection of Nuclear Material — enters into force. It will reduce the likelihood of terrorists being able to detonate a "dirty bomb", and the risk of a terrorist attack on a nuclear power plant.

Entry into force of the Amendment has been a painfully slow process. Under the Amendment, countries are required to establish appropriate physical protection regimes for nuclear material. They also take on new obligations to share information on sabotage, and credible threats of sabotage.

As the Amendment enters into force, I will bring the Parties together to work out ways of improving the mechanisms for sharing such information, while protecting confidentiality. I plan to host annual meetings of national Points of Contact for

the Convention, as well as periodic Review Conferences. However, even with entry into force, there will still be a large number of countries which are not parties to the Amendment. So our new goal must be universal application of the amended Convention.

Ladies and Gentlemen, The IAEA has unique emergency response capabilities in the form of our Incident and Emergency Centre. It would become operational within minutes after a State reported a nuclear security-related incident to us. We could send nuclear security experts and radiation measurement teams to the affected country, help organise medical assistance and organise nuclear forensics investigations.

The IAEA has unique emergency response capabilities in the form of our Incident and Emergency Centre. It would become operational within minutes after a State reported a nuclear security-related incident to us. We could send nuclear security experts and radiation measurement teams to the affected country, help organise medical assistance and organise nuclear forensics investigations.

Ladies and Gentlemen, With 168 Member States, the IAEA has the global reach and the technical expertise to serve as an effective global nuclear security platform. We will hold an International Conference on Nuclear Security, with a ministerial component, in December. Please encourage ministers from your country to attend.

In order to maintain the momentum, I expect that this high-level conference will take place every three years in future.

The IAEA's responsibilities in nuclear security will grow in the coming years. We need sustained political and financial support from you. Working closely with national experts and key international partners, the IAEA will continue to deliver tangible improvements in nuclear security. Thank you.

Source: <https://www.iaea.org>, 01 April 2016.

OPINION – Hubert Foy

Radiological Terrorism: The Unaddressed Threat

Fissile material gets all the attention. Well, most of it anyway—whether at the Nuclear Security Summits or here in this roundtable. And that's

understandable. Substances that terrorists might fashion into nuclear bombs do deserve the lion's share of attention whenever nuclear security is discussed. But radioactive sources—materials produced because they emit radiation useful in agriculture, industry, construction, medicine, mining, research, and transportation—are quite dangerous in their own right. They number in the millions. Tens of thousands of these sealed radioactive sources—small capsules of highly concentrated radioactive material in solid form—merit real concern. They can be vulnerable to theft and to black-market sale. Worse, they could be used by jihadists to make a radioactive dispersal device, otherwise known as a dirty bomb.

So far, the threats posed by radioactive sources have gone largely unaddressed. To be sure, radioactive sources were introduced to the agenda of the Nuclear Security Summits in 2012, when the Seoul communiqué emphasized the importance of insuring that radiological sources aren't put to malicious use. But four years and two summits later, radioactive sources continue to pose a very real threat. As my colleague Nilsu Goren mentioned in Round One, up to 10 grams of iridium-192 were stolen just last year from a storage facility in Iraq. The material was later recovered, but the incident was alarming. Accordingly, a letter signed by 35 Nobel laureates ahead of the recent summit urged world leaders "to devote the necessary resources to make further substantial progress...in preventing nuclear and radiological terrorism."

Tracking and accounting for radiological sources is not easy. As noted, sources are broadly dispersed and are used in a wide variety of

applications. They are often trafficked across borders by smugglers or insiders seeking profit through illegal trade. This means that many radioactive sources lie outside regulatory control and are very vulnerable to misuse. Between 2013 and 2014, some 133 member states reported to the IAEA at least 276 incidents of illicit trafficking or other unauthorized activity involving radioactive sources. With governments and the private sector unable to trace radioactive material from manufacturer to user and ultimately to safe disposal, chances are unacceptably high that terrorists will someday detonate a dirty bomb.

But opportunities exist for strengthening the protection afforded to radioactive sources—for example, by achieving universal adherence to and implementation of the IAEA's Code of Conduct on the Safety and Security of Radioactive Sources. The code seeks the "development and harmonization of policies, laws, and regulations on the safety and security of radioactive sources."

Unfortunately, as of February, only 130 of 168 IAEA member states had committed to the code politically, and only 103 had notified the agency that they intended to act in accordance with the related Guidance on the Import and Export of Radioactive Sources. Nor have many states established robust, comprehensive legal and regulatory frameworks for radiological security. In Ghana, where I work, President John Mahama last year signed the Nuclear Regulatory Act of 2015, making Ghana just the third country in sub-Saharan Africa with an independent nuclear regulatory authority. Weak legal structures in many countries—along with the lack of universal

Substances that terrorists might fashion into nuclear bombs do deserve the lion's share of attention whenever nuclear security is discussed. But radioactive sources—materials produced because they emit radiation useful in agriculture, industry, construction, medicine, mining, research, and transportation—are quite dangerous in their own right. They number in the millions.

Sources are broadly dispersed and are used in a wide variety of applications. They are often trafficked across borders by smugglers or insiders seeking profit through illegal trade. This means that many radioactive sources lie outside regulatory control and are very vulnerable to misuse. Between 2013 and 2014, some 133 member states reported to the IAEA at least 276 incidents of illicit trafficking.

adherence to the Code of Conduct—mean that a vast number of radiological sources exist outside national and international security mechanisms.

Another opportunity for improved radiological security is to establish regular training and educational opportunities for personnel involved in the management and disposal of radioactive sources. Effective security procedures depend on the behavior of individuals who actually work with radiological devices. New educational and training programs should be developed, specifically tailored for radiological source security, through the IAEA, the International Nuclear Security Education Network, or other entities. All such efforts should be aimed at cultivating a strong security culture.

Finally, the private sector could provide a stronger first line of defense against radioactive material falling into terrorist hands. Radiological best practices should be regarded as an issue of corporate responsibility and instilled across entire industries. Organizations such as the IAEA and the World Institute for Nuclear Security could facilitate international exchanges allowing firms to share best practices. These organizations could also facilitate upgrades to the equipment that firms use for physical protection, accounting, and detection of nuclear smuggling. Initiatives such as these are not glamorous. But they may be the difference between a normal day in some global capital—and the day when a dirty bomb abruptly forces the world to view radiological security in a new, unpleasant light.

Source: <http://thebulletin.org>, 12 April 2016.

OPINION – WPS Sidhu

Lessons from the Nuclear Security Summits

The NSS process—to prevent non-state actors, particularly terrorists, from acquiring nuclear

material—was launched with fanfare in 2010 by US President Barack Obama with the ambitious objective “to secure all vulnerable nuclear material in four years”. Six years and four summits later—the last of which concluded on 1 April—this aim has not been reached, despite substantial progress being made.

Since the NSS process began, more than 175 tonnes of HEU—enough for nearly 7,000 nuclear weapons—has been removed or down-blended (mostly from Russia); 30 countries have eliminated all HEU from their territory; and radiation detection equipment has been installed at 329 international border crossings, airports and seaports to prevent, detect and respond to trafficking in nuclear and other radioactive material.

Additionally, the Convention on the CPPNM, with the 2005 amendment, is now only eight signatures shy of entering into force and the ICSANT has been signed by 103 of the 193 United Nations members. However, an estimated 1,400 tonnes of HEU and nearly 500 tonnes of plutonium—enough for about 200,000 simple fission-type nuclear bombs—is still held by more than 30 countries. Moreover, the absence of Russian President Vladimir Putin (over strategic differences with the US) indicates that progress towards this cause is susceptible to the overall state of bilateral relations. Similarly, the failure to invite Iran (despite the nuclear deal) was a missed opportunity to engage Tehran on a crucial issue of global importance. Finally, as reports emanating from Brussels before the summit indicate, despite the NSS’ efforts, the possibility of terrorist attacks on nuclear facilities has not been eliminated even in nations such as Belgium.

These achievements and challenges underline several key lessons from the NSS process. First, because the NSS is narrowly focused on the threat

Since the NSS process began, more than 175 tonnes of HEU—enough for nearly 7,000 nuclear weapons—has been removed or down-blended (mostly from Russia); 30 countries have eliminated all HEU from their territory; and radiation detection equipment has been installed at 329 international border crossings, airports and seaports to prevent, detect and respond to trafficking in nuclear and other radioactive material.

of non-state actors acquiring nuclear material, it took great initiative on the part of the US to get it going; it is unlikely that any other world leader could have led a similar project. This indicates, as Obama boasted, that even in the multi-polar era, the world is dependent on US leadership. However, as the absence of Putin and the inability of the process in securing all nuclear material in four years reflect, there are limits to even what the US leadership can achieve. Besides, the fact that the 2012 and 2014 summits were held in South Korea and the Netherlands respectively—both US allies from the developed world—indicates that Washington is still not able to find willing partners for its initiatives in the global South.

Second, some experts argue that the NSS process only deals with nuclear material in civilian facilities and not the military nuclear facilities, which account for about 83% of all nuclear material. This is disputed by others who assert that the NSS communiqués along with the CPPNM, the ICSANT and UN Security Council resolution 1540 deal with all nuclear material—civilian and military. What is not in dispute, however, is that the danger posed by forward-deployed tactical nuclear weapons, particularly by Pakistan, Russia and the US, has not been addressed and needs to be remedied.

Finally, the relative success of the NSS process also underlines the failure of the international community to address similar dangers emanating from biological weapons. As there is no international regime or institution to deal with biological weapons, they remain largely unregulated. Indeed, non-state actors and individuals are increasingly conducting research in biotechnology, especially, synthetic biology. For India, while its contribution to the success of the NSS process is useful to highlight its credentials as a responsible nuclear state, any initiative on

similar threats from biological weapons and its ability to rally others to the cause would enhance its credibility as a global leader.

Source: <http://www.livemint.com>, 11 April 2016.

OPINION – Seema Sirohi

Indian Diplomacy in Full Flow at Nuclear Security Summit, Eyes Firmly Set on NSG Next

It was a short visit but Prime Minister Narendra Modi maximised the time and presence of 50 world leaders at the Nuclear Security Summit to India's advantage with sharp and targeted diplomacy. Modi highlighted India's progress in developing a "strong security culture" to establish even more "street creds" as a responsible nuclear power. At the same time, he used the opportunity to garner support for India's entry into the NSG – the next step in the world's acceptance of India in the global nuclear scheme. Key announcements at the summit included India joining three "gift baskets" or joint endeavours in priority areas – countering nuclear smuggling, the contact group in Vienna to carry on the work of the summit, and sharing best practices through centres of excellence.

In addition, New Delhi will host an international conference with Interpol, a key player in preventing the smuggling of nuclear, biological, radiological and chemical materials. Modi released India's national progress report, which underlines the various steps the country has taken on nuclear security – updating export controls for companies manufacturing nuclear technology, taking "robust strides" towards implementing nuclear safeguards, setting up an inter-ministerial counter-smuggling team, using low-enriched uranium instead of HEU and shutting down the only reactor using HEU, setting up 23 response centres across the country to take care of any nuclear or radiological emergency and putting a cyber security architecture in place. Apart from doing things at home, India is

What is not in dispute, however, is that the danger posed by forward-deployed tactical nuclear weapons, particularly by Pakistan, Russia and the US, has not been addressed and needs to be remedied. Finally, the relative success of the NSS process also underlines the failure of the international community to address similar dangers emanating from biological weapons.

also active on the international front. It announced a \$1 million grant for the IAEA, the lead organisation invested in strengthening nuclear security, in addition to the \$1 million it contributed in 2013.

Rallying Support: The slew of Indian offers should mitigate complaints about New Delhi not pulling its weight or hiding in a cloud of opacity. Indian officials are hopeful the international community led by the US will respond positively. It is clear that Modi is vigorously taking forward the 2008 Indo-US nuclear deal, hammered together by his predecessor Manmohan Singh and the Bush administration, to end the "nuclear apartheid" India faced and engineer the acceptance of the country as a nuclear weapons power on the world stage. If one were to guess what Modi said to US President Barack Obama during the working dinner on 31st March, when he was seated on one side and Chinese President Xi Jinping on the other, it would have been to urge Obama to show him the money – as they say in America – and to get his bureaucracy moving to put more meat and meaning in the American pivot. US sources confirmed they are working to move things along for India's membership in the NSG at the June plenary after a period of what New Delhi saw as neglect.

The selection of world leaders with whom Modi sought meetings over two days was also aimed at rallying support within the NSG. He met the leaders of Canada, Kazakhstan, Britain, New Zealand, Switzerland, and Japan – not by random selection but by intelligent design. They all are members of the NSG, the group that controls the export of nuclear technology and which, ironically, was set up in response to India's first nuclear test in 1974. Yes, there were glowing tributes by Modi to bilateral relations with each

country's leader but the real aim was to win more friends and convince the sceptics and massage those already supportive. The idea – the more positive the feelings towards India's NSG entry, the more isolated will be the opponents and the greater the chance of success. Nordic countries, traditionally critical of India's nuclear weapons'

It is clear that Modi is vigorously taking forward the 2008 Indo-US nuclear deal, hammered together by his predecessor Manmohan Singh and the Bush administration, to end the "nuclear apartheid" India faced and engineer the acceptance of the country as a nuclear weapons power on the world stage.

programme, have softened their stance. In reality, the only real opposing party is China, which just happens to be Pakistan's all-weather friend and also a violator of NSG rules. Those violations have gone unpunished by the rest of the member

countries. It is believed that if China is left as the last man standing against India's entry, it may decide to back off, especially if Washington puts its might behind the effort in pushing New Delhi's case, as it did in back in 2008. This is the stuff of which nuclear diplomacy is made – it helps that Modi has hardy "sherpas" in the external affairs ministry who understand both the substance and politics of the nuclear issue.

Even though Modi had met British Prime Minister David Cameron just three months ago, he made sure to seek him out again in Washington to ensure the British continued their support and used their influence with other European leaders in the NSG in India's favour. Modi recalled his November visit to London that "changed bilateral relations forever", created "history" at Wembley, and made ties ever "richer", in the words of Vikas Swarup, the spokesman for the external affairs ministry.

Nordic countries, traditionally critical of India's nuclear weapons' programme, have softened their stance. In reality, the only real opposing party is China, which just happens to be Pakistan's all-weather friend and also a violator of NSG rules. Those violations have gone unpunished by the rest of the member countries.

Similarly with Canada's Prime Minister Justin Trudeau, Modi ensured the young leader heard India's story from the horse's mouth. It was the first time the two met – it was Stephen Harper who was Prime Minister when Modi visited Canada last year and secured a \$350 million deal

for Canadian uranium, ending the long moratorium on doing nuclear business with India. Winning Trudeau's confidence was important. And so it went with Prime Minister John Key of New Zealand, considered a mild sceptic about India's entry into the NSG. They discussed cricket to break the ice but then it was business as usual, sources said.

Addressing American

Concerns: Constructive as these engagements were, the fact remains that the

bulk of the burden has to be carried by American sherpas at the NSG. If they succeed, it would be a game changer for bilateral relations. Obama and Modi have mentioned the NSG in their joint statements and India has taken many steps to fulfil its part of the bargain. After losing the ball during UPA II, New Delhi has moved hard to inject momentum into the Indo-US civil nuclear deal to address American complaints about liability issues. The insurance pool is up and running and money has been raised from the private sector, which should be music to American ears.

India has upped the offer to Westinghouse from two to six units to make everything more economical, from construction costs to the cost of power. This grows the pie from \$8 billion to \$24 billion for the US nuclear vendor. The company is now engaged in talent spotting for trained personnel to begin construction of the nuclear plants. The new attitude is also reflected in India being "more open" and less defensive about its nuclear programme. It is participating in more expert group meetings,

submitting joint papers with the US, and seeking technical help. India is making sure that it is part of the dialogue moving forward after this fourth

and last Nuclear Security Summit. There is little point in listing how Pakistan hasn't played by the rules – exhibit A being its fervent pursuit of tactical nuclear weapons and exhibit B the

presence of radical elements within its armed forces, both of which have given American officials major headaches.

In the end, officials hope that India's efforts in helping to achieve the summit's primary goal – preventing increasingly tech savvy terrorists from

ever getting close to anything nuclear – made an impact at the nuclear gathering. The question facing the international community: Does it make sense to keep India out of the global export control regimes?

Source: <http://thewire.in>, 02 April 2016.

OPINION – Allison Macfarlane

How to Protect Nuclear Plants from Terrorists

In the wake of terrorist attacks in Brussels, Paris, Istanbul, Ankara and elsewhere, nations are rethinking many aspects of domestic security. Nuclear plants, as experts have long known, are potential targets for terrorists, either for sabotage or efforts to steal nuclear materials.

Currently there are 444 nuclear power plants operating in 30 countries around the world and 243 smaller research reactors, which are used to produce isotopes for medical uses and to train nuclear engineers. The nuclear industry also includes hundreds of plants that enrich uranium and

fabricate fuel for reactors. Some of these facilities contain materials terrorists could use to build a nuclear or "dirty" bomb. Alternatively, power

Constructive as these engagements were, the fact remains that the bulk of the burden has to be carried by American sherpas at the NSG. If they succeed, it would be a game changer for bilateral relations. Obama and Modi have mentioned the NSG in their joint statements and India has taken many steps to fulfil its part of the bargain.

The new attitude is also reflected in India being "more open" and less defensive about its nuclear programme. It is participating in more expert group meetings, submitting joint papers with the US, and seeking technical help. India is making sure that it is part of the dialogue moving forward after this fourth and last Nuclear Security Summit.

plants could be “hijacked” to create an accident of the sort experienced at Chernobyl and Fukushima, sending clouds of radioactivity over hundreds of miles.

At Nuclear Security Summit in Washington, D.C., representatives from 52 countries pledged to continue improving their nuclear security and adopted action plans to work together and through international agencies. But significant countries like Russia and Pakistan are not participating. And many in Europe are just beginning to consider physical security measures. From my perspective as a former nuclear regulator and now as director of the Center for International Science and Technology Policy at George Washington University, it is clear that nuclear plants are vulnerable to terrorist attacks.

Physical and Cyber Threats: It is not news that security is weak at many civilian nuclear power and research facilities. In October 2012, Greenpeace activists entered two nuclear power plants in Sweden by breaking open a gate and scaling fences without being stopped by guards. Four of them hid overnight on a roof at one reactor before surrendering the next morning.

Just this year, Sweden’s nuclear regulatory agency adopted a requirement for armed guards and additional security measures at the plants. However, these upgrades do not have to be in place until early 2017. In 2014 French nuclear plants were plagued by unexplained drone overflights. And Greenpeace activists broke into the Fessenheim nuclear plant near the German border and hung a large banner from the reactor building.

In light of the recent Brussels attacks, reports from Belgium are more alarming. In 2012 two employees at the country’s Doel nuclear power station left Belgium to fight in Syria. In 2014 an unidentified saboteur tampered with lubricant in the turbine at the same reactor, causing the plant

to shut down for five months. And earlier this year authorities investigating the Paris attacks discovered video surveillance footage of a Belgian nuclear official in the home of one of the Paris suspects.

One has to assume that potential attackers may understand how the sites and materials can be used. Given the heightened state of alert in Europe, governments should, I believe, immediately increase security at civilian nuclear facilities. They could emulate the United States,

where security at nuclear facilities has substantially increased since the September 11, 2001 terrorist attacks.

American Role Model: US nuclear power plants now

are some of the most well-guarded facilities in the world. The US NRC regulates both safety and security at nuclear power plants. After 9/11, these sites were required to add multiple layers of protection, with the cores of reactors (where the fuel is located) the most highly defended areas.

Up to one-third of the workforce at many US nuclear plants now is security-related. Many nuclear utilities used to hire contract security forces; now guards at many of these plants are employed directly by plant owners and have opportunities to move to other jobs at their sites, increasing employee satisfaction and improving performance.

NRC regulations require US nuclear plants to hold regular drills in which well-trained former military units attack the plants with up-to-date materials and techniques. NRC observers evaluate these exercises, and facility owners face stiff penalties for failure. The United States has also adopted regulations to ensure cyber security at reactors. As new, entirely digital reactors come online, such measures will be more necessary than ever. The successful 2010 Stuxnet attack, for example, in which a computer worm infiltrated computers at Iranian nuclear facilities and caused machines to malfunction, showed how vulnerable unprotected

In 2014 French nuclear plants were plagued by unexplained drone overflights. And Greenpeace activists broke into the Fessenheim nuclear plant near the German border and hung a large banner from the reactor building.

computer networks can be.

Improving Security Worldwide: There are no global standards for physical protection at civilian nuclear facilities. Each country adopts its own laws and regulations dictating what nuclear site owners are required to do to protect plants from attack.

As a result, measures at plants can vary widely, with some countries depending on the local police force for protection and leaving guards unarmed. Often the level of security depends on cultural norms and attitudes, but the recent attacks in Europe suggest a rapid adjustment is needed. Here are steps that, in my view, all countries can take to make nuclear plants more secure.

One priority is to provide enough funds to the IAEA, which has recently elevated its physical security section to assist member countries looking for ways to protect their nuclear plants more effectively. Since 2010 the agency has trained more than 10,000 people in nuclear security, including police and border guards. It also tracks illicit trafficking and other activities involving nuclear material, and has recorded nearly 3,000 such events since 1995.

Countries that have nuclear power plants or research reactors understandably tend not to spotlight the challenges of protecting these sites. But we know from instances like the ones cited above that they exist. In many countries nuclear regulatory agencies oversee safety but not security. Each of these nations needs to empower an independent regulator to enforce new requirements and inspect security at nuclear sites. Most importantly, security forces at nuclear facilities should be required to practice attack scenarios regularly under the gaze of independent observers. Countries such as the United States that already have solid physical security requirements for nuclear facilities can help.

Nuclear regulators from all countries meet

regularly and could easily share information and train their counterparts on plant physical security. In December 2012, for example, the US NRC organized the first-ever International Regulators Conference on Nuclear Security. No other government has offered to head up a follow-on meeting since then.

And countries with existing reactors aren't the only problem. At least 60 countries have expressed a desire to acquire nuclear power. The UAE is in the process of constructing four reactors. Turkey and Vietnam have made deals with the Russian manufacturer, Rosatom, in which construction, financing, operation, even waste disposal, will be handled solely by the Russians. Many of these "emergent" countries do not regularly attend Convention on Nuclear Safety peer review meetings at the International Atomic Energy Agency. Without a security regime in place, how can we expect them to do any better than the existing plants?

To prevent an attack at a nuclear site, governments must take security at nuclear sites seriously now, not a year from now. In light of the current terrorist threat and with four Nuclear Security Summits completed, countries with nuclear plants need to up their game with regards to physical security at nuclear power facilities before it's too late.

Source: <http://www.usnews.com>, 13 April 2016.

OPINION – Ibne Ali

Pakistan's Coziness with Non-State Actors Represents the Single Greatest Global Nuclear Security Threat

Cold war history is a cautious testament to the deterrent capabilities of nuclear weapons. Times have changed, however. Today, in South Asia, Pakistan's strategic manipulation of its nuclear capability to conduct a proxy war with India is pushing the region towards a catastrophic scenario. Simply put, Pakistan is pushing the

boundaries of what it can get away with. A country embodying contradictions since it came to existence last century, Pakistan has given more and more cause for worry over the years, particularly since 2007. ...At the heart of the problem is not Pakistan's nuclear arsenal, but its treacherous, self-destructive and parochial, alliance with extremist elements, whose machinations are inevitably corrosive to the country's fragile democracy.

Pakistan's perennial non-unitary behavior, as political scientist and nuclear strategy expert George Perkovich puts it, creates ambiguity in its strategic intentions for its nuclear-armed rival, India. The Islamic state's use of extremist militants against India with little or no state control over them, he rightly warns, creates a deadly sense of ambiguity in the country's strategic intentions. The longstanding debate over why Washington should be alarmed by a nuclear ally's strategy of fostering terrorism saw a decisive shift in the aftermath of Peshawar school attack. As the coffins of more than 130 uniformed children killed by the Taliban in December 2014 rolled out, the mood changed in Pakistan. There were expectations that the incident would shake the conscience of those who had hand-reared the gun-toting militants and prompt a change in the country's decades-old policy of using terror networks as an instrument of foreign policy.

Prime Minister Nawaz Sharif went as far as saying that the state would not make any distinction between good and bad Taliban any more, in what was seen by some as a self-incriminating proclamation, conceding the state's collusion with militant outfits. But 15 months since the atrocities at Peshawar, little appears to have changed fundamentally in Pakistan's approach to dealing

with its home-grown militant groups, many of whom continue to function autonomously. Following the Peshawar massacre the pressure on Islamabad to 'do something' was enormous.

A country embodying contradictions since it came to existence last century, Pakistan has given more and more cause for worry over the years, particularly since 2007. ...At the heart of the problem is not Pakistan's nuclear arsenal, but its treacherous, self-destructive and parochial, alliance with extremist elements, whose machinations are inevitably corrosive to the country's fragile democracy.

Expectedly, it talked the talk. But what followed only confirmed that it was going to be no more than cosmetic posturing. After getting several political parties to agree on a twenty-point national action plan on counter-terrorism, the Sharif

government swiftly swung into action. In addition to arresting thousands, it lifted a six-year old moratorium on death penalty, and executed 319 people in less than a year. Since then, rather unsurprisingly, it has emerged only 2 percent of those arrested had any connection with militant groups. Meanwhile, a majority of those executed had nothing to do with terrorist activities.

Even though the number of terror attacks on Pakistani soil has come down over the past year, giving a facade of success on the ground, the progress is largely hollow. What has been conspicuously lacking in the counter-terrorism action plan is Pakistan's will to dismantle its jihadi industrial complex that incorporates several terrorist networks. Since 2000, despite international condemnation, nearly all jihadist militant groups based in Pakistan are still flourishing and openly recruiting with impunity.

Even though the number of terror attacks on Pakistani soil has come down over the past year, giving a facade of success on the ground, the progress is largely hollow. What has been conspicuously lacking in the counter-terrorism action plan is Pakistan's will to dismantle its jihadi industrial complex that incorporates several terrorist networks.

For example, despite a \$10 million bounty on his head, Hafez Saeed, the founder of LeT—the group that masterminded and executed the 2008 Mumbai attack—comfortably runs another well-oiled propaganda group, JuD, which has a network

of 300 educational centres, all in the guise of a religious charity. Saeed's close aide, who was on trial for the 2008 Mumbai attacks, was released from jail last year. LeT and similar groups highlight where the fears over the safety of Pakistan's nuclear arsenal lie. For it's not so much the activities of these jihadist groups as their potential far-reaching access into the security apparatus that causes severe discomfort. US scholar John Mueller has made a compelling argument debunking fears of Pakistani nuclear weapons falling into the hands of even the most steadfast and single-minded terrorist groups or other non-state actors.

Even if they did, he argued, the rogue group would be hard pressed to furtively acquire the technical know-how for a successful launch or detonation. He, however, did not account for a range of complexities uniquely besetting a country like Pakistan. With three military coups since independence, Pakistan's military presents a unique mix of dangers and risks. United in their target but disunited in their techniques, the myriad actors—the army, the civilian government, the Inter-Services Intelligence, and militant groups—running this deeply troubled country are often difficult to tell apart and blur together.

Out of this mix, however, Islamist groups now hold the greatest sway over the masses. This is particularly worrisome in the wake of the current global climate of hysteria whipped by the likes of the Islamic State, Boko Haram, and Al Shabab. Islamic fundamentalists' appeal and grasp over the masses is dangerously far reaching and only growing deeper. ...

Moreover, consider LeT—arguably the largest jihadi group in South Asia, with a base of several thousand fighters, many of whom are well-educated, debunking the myth that extremism is the consequence of poverty and ignorance. LeT's

largest jihadist cohort comes from the Punjab region, which is also the largest recruiting ground for the Pakistani army. More alarmingly though is the kinship many fighters have with those in the army, national institutions, and political elite, as revealed by several independent studies. Shockingly, one militant's obituary went as far as claiming a close familial relationship with a director of Pakistan's Atomic Energy Commission.

The smouldering antipathy towards the West in general and India in particular is not limited to the radicals alone. Evidence of deep-seated radicalization in the Pakistani army's middle and lower ranks, sections of whom collaborate with the ISI to train and handle militant groups, has been mounting for years. This radicalization is the result

The real danger, thus, lies in Pakistan's refusal to acknowledge its own deep-seated malaise. Just days before the Nuclear Security Summit, Sartaj Aziz remains adamant on branding India as a bigger danger to Pakistan's security than home-grown terrorism. There are no indications that suggest Pakistan's willingness in recalibrating this deadly calculus in the region either.

of a deep-running long-term resentment against their own government's alliance with the United States during its war on terror, which over the years has forced them to turn on the militant groups they themselves nurtured over three decades and with whom they share common religious ideologies.

The real danger, thus, lies in Pakistan's refusal to acknowledge its own deep-seated malaise. Just days before the Nuclear Security Summit, Sartaj Aziz, Prime Minister Sharif's advisor on foreign affairs, remains adamant on branding India as a bigger danger to Pakistan's security than home-grown terrorism. There are no indications that suggest Pakistan's willingness in recalibrating this deadly calculus in the region either. Islamabad's steadfast refusal to reduce the number of its nuclear warheads following the Pakistan-US Strategic Dialogue in Washington earlier in March only strengthens the supposition that the country's military cannot separate its institutional interests from its broader security policy towards India and Afghanistan.

Pakistan must realize that similar to any fraternity, the exclusive nuclear weapon states club expects

its members to abide by certain conditions. The ability of these states to demonstrate a state monopoly over the deployment of physical force and restricting the use of their nuclear endowments to deterrence purposes are among the most important conditions in the clique's unwritten rulebook. Pakistan's use of non-state actors in pursuit of its foreign policy objectives and willingness to 'use' nuclear weapons in a conventional conflict may not revoke the country's membership in this club, but its administrators reserve the right to introduce new stringent rules for its members.

Source: <http://thediplomat.com/>, 30 March 2016.

OPINION – KYODO

Nuclear Weapons-free World Seems Distant

Japan tried to revive momentum toward a world free of nuclear weapons at the Group of Seven foreign ministers' meeting in Hiroshima, but questions remained about how to get states like North Korea to give up their nuclear ambitions as well as how to remove deep-seated fears about losing nuclear deterrence.

The meeting in Hiroshima, the first of the two Japanese cities to suffer US A-bomb attacks in 1945, was highlighted by a symbolic visit by US Secretary of State John Kerry to the Hiroshima Peace Park. On the fringes of the two-day G7 meeting, Kerry laid flowers at a cenotaph for atomic bomb victims along with counterparts from countries including Britain and France, becoming the first US secretary of state to do so.

The ministers also released the Hiroshima Declaration on Nuclear Disarmament and Non-Proliferation, separate from the usual joint communique, noting that Hiroshima and Nagasaki "experienced immense devastation and human suffering as a consequence of the atomic bombings." The declaration also said, "For decades, political leaders like us and other visitors

have come to Hiroshima and Nagasaki and been deeply moved. We hope others follow the path. We share the deep desire of the people of Hiroshima and Nagasaki that nuclear weapons never be used again."

Japanese Foreign Minister Fumio Kishida told a press conference after the gathering, "The G7 members, which include both nuclear-weapons states and nonnuclear-weapons states, were able to reach a consensus and issue a strong message. I strongly believe that was significant."

Kishida carefully planned the wording of the Hiroshima Declaration and the logistics of the G7 foreign ministers' visits to the park through consultations with respective governments prior to the meeting. He hoped that such visits by global leaders and a declaration would revive disarmament talks that have recently suffered

severe setbacks as seen in the breakdown of the U.N. disarmament conference last year.

If Kerry's historic visit to the peace park is met positively in the United States and Japan, the

White House may seriously consider a visit by US President Barack Obama to the park. Hopes have grown that Obama will visit Hiroshima after his ambitious vision of a world without nuclear weapons announced in a landmark speech in Prague in April 2009 won him the Nobel Peace Prize. But as seen in the collapse last year of the NPT review meeting, nuclear and non-nuclear states remain divided.

Non-nuclear countries such as Austria and Mexico are pushing for a legal ban on nuclear weapons, a move nuclear powers including the United States and France see as too early given existing security concerns. Last November, a Japan-sponsored draft resolution calling for the abolition of nuclear weapons received overwhelming approval from a UN General Assembly committee but failed to secure endorsement from the United States and other

Non-nuclear countries such as Austria and Mexico are pushing for a legal ban on nuclear weapons, a move nuclear powers including the United States and France see as too early given existing security concerns.

key powers. None of the five nuclear powers that sit on the UN Security Council endorsed the document. In what was particularly alarming for Japan, Britain, France and the United States abstained after they had supported the Japan-led initiative the previous year.

"The release of the Hiroshima Declaration and the visit by G7 foreign ministers to the park are hoped to revive the stalled disarmament talks but realistically speaking, such initiatives are not enough to counter the downtrend in disarmament talks," said Heigo Sato, a professor at Takushoku University who specializes in arms control. "However, Japan is destined to articulate the humanitarian impact of the use of nuclear weapons and the pursuit of disarmament is one of the pillars of the country's diplomatic policy. I think Foreign Minister Kishida is in a difficult position," Sato said.

Japan's stressing of the humanitarian impact of using nuclear weapons may hurt its relations with the United States, which offers Japan security protection under its extended nuclear umbrella, Sato said. In apparent consideration of the nuclear powers in the G7 framework, the phrase "humanitarian impact" was dropped from Monday's declaration in reference to the use of nuclear weapons, despite it being traditionally stressed by Japan in previous disarmament-related statements. Instead, the phrase "human sufferings" was included in reference to the devastation experienced by Hiroshima and Nagasaki.

Experts also say there is little room for the United States to advance disarmament talks given its soured ties with Russia over the Ukraine crisis. Russian President Vladimir Putin has said on Russian state-run television that Moscow was ready to put its nuclear forces on alert over Russia's confrontation with the West regarding

Ukraine and the annexation of Crimea in 2014.

"Disarmament and security are inseparable. So we must take a realistic approach," said a senior Japanese Foreign Ministry official. "The (nuclear-weapons-free) world that President Obama said he will aim for has not been realized. In contrast, the importance of the power of nuclear deterrence has gained renewed recognition in the North Atlantic Treaty Organization because of Russia."

Ironically, Japan is likely to become more dependent on the protection of the US nuclear umbrella amid North Korea's heightening nuclear threats and the Chinese military buildup. "The United States will continue to extend deterrence to Japan through the full range of capabilities, including US nuclear forces," reads the Guidelines for Japan-US Defense Cooperation, which were revised in April last year.

Source: *Japan Today*, 14 April 2016.

Ironically, Japan is likely to become more dependent on the protection of the US nuclear umbrella amid North Korea's heightening nuclear threats and the Chinese military buildup. "The United States will continue to extend deterrence to Japan through the full range of capabilities, including US nuclear forces," reads the Guidelines for Japan-US Defense Cooperation

NUCLEAR STRATEGY

INDIA

India Conducts Secret Test of Submarine-launched K-4 Nuclear-Capable Missile

India has reportedly conducted a secret test of the nuclear-capable undersea ballistic missile, code named K-4. As per a report published in *The New Indian Express*, the SLBM was test-fired from INS Arihant at an undisclosed location in the Bay of Bengal. The report quoted a source as saying that the missile was test-fired on March 31 some 45 nautical miles from the Vishakhapatnam coast in Andhra Pradesh. The missile test was dubbed as 'highly successful'.

The K-4 missile, developed indigenously, was test-fired with a dummy payload in full operational configuration. The report said the missile was launched from a 20-meter depth and successfully

broke through the water surface. Among the notable features of the K-4 SLBM, its range is 3,500 km. The missile measures 12 metre in length and 1.3 metre in width. It weighs 17 tonnes and can carry a nuclear payload of 2,000 kilograms. Its engine is solid fuelled. It may be remembered that a prototype of K-15 (B-05) missile was test-fired from INS Arihant last November.

Construction of the Shidao Bay Power Plant started in December, 2012. With a designed capacity of 200 megawatts, it will start generating power by the end of 2017. The design involves two reactors and steam generators, and one turbine generator.

Source: <http://zeenews.india.com>, 13 April 21016.

NUCLEAR ENERGY

CHINA

World's First 4th-Generation Nuclear Power Plant

China has stepped up its efforts to commercially utilize a fourth-generation nuclear reactor. At a coastal town in east China, a high-temperature, gas-cooled reactor is being constructed. It's claimed to be the safest in the country. The project has been designed to merge high efficiency and output, with minimum radiation leakage. CCTV reporter visited the plant and filed this exclusive report. Shidao Bay, on the eastern tip of the Shandong Peninsula.

A nuclear power plant, using fourth generation technology, is taking shape. It's China's first with independent intellectual property rights. He Yunsheng began his career in the nuclear industry in 1985. Now he is in charge of this national pilot program. "An obvious feature of the 4th generation nuclear reactor is the intrinsic safety of the fuel elements, which are covered by silicon carbide particles. It will not result in radiation leakage because of the passive cooling system. Unlike the second and third generation reactors, the fourth will not experience a nuclear meltdown," said He Yunsheng, General Manager of Huaneng Shandong Shidao Bay Nuclear Power Plant.

Once completed, over 400 thousand fuel pebbles like this will be put inside to produce a temperature as high as 750 degrees Celsius. The design involves four protection layers to avoid radiation leakage.

Construction of the Shidao Bay Power Plant started in December, 2012. With a designed capacity of 200 megawatts, it will start generating power by the end of 2017.

The design involves two reactors and steam generators, and one turbine generator. "Generation Four nuclear technology can enhance power generation efficiency, and is much

safer, its multi-functional nature will further increase the proportion of clean energy in China. It can also bring power generation to public heating services," said He. The reactor is gas-cooled using helium. This removes heat from fuel pebbles in the reactor's core and starts the steam generators. This is the core of the high-temperature gas-cooled nuclear reactor. Once completed, over 400 thousand fuel pebbles like this will be put inside to produce a temperature as high as 750 degrees Celsius. The design involves four protection layers to avoid radiation leakage. He Yunsheng says Chinese scientists have worked on the reactor's safety features since the 1970s.

However, even with the current high standards, he believes there's still room for improvement. "The main challenge is to improve its economic efficiency. What we are now doing is a pilot program. More efforts

should be done in the near future to optimize the design so that we can compete with others types of nuclear power plants. I believe we have that potential," said He Yunsheng. The whole project at Shidao Bay is estimated to be completed in 2024 when the plant's capacity will be 40 times higher than that of next year. By then, Mr. He will be approaching retirement. After a lifetime of work in the nuclear industry, he says his only hope is that the technology continues to be used safely.

Source: <http://english.cctv.com>, 04 April 2016.

INDIA

Kudankulam Nuclear Power Plant First Unit Would Soon Generate 1000 MW

The first reactor of Kudankulam Nuclear Power Plant would generate power to its full capacity of 1,000 MW within a few days, KNPP site director R.S. Sundar said on 8 April, 2016. Speaking to reporters in Tirunelveli on the sidelines of a function, he said the first unit was presently generating 960 MW and it would generate power to its maximum capacity in a few days.

Kudankulam Nuclear Power Plant started commercial operations on December 31, 2014. Fuel loading work in the second reactor would take place during the month-end, he said, adding power generation would begin after obtaining requisite permission from the AERB. Construction work for the third and fourth reactors would start this year, he added. Earlier on June 24, 2015 the first plant at KNPP, an Indo-Russian collaborative venture, was shut down for maintenance after being in commercial operation since December 31, 2014. Power generation at the plant had resumed on January 30, 2016. The plant crossed the 1,000 MW milestone on June 7, 2014 at 1.20 p.m.

Kudankulam Nuclear Power Plant started commercial operations on December 31, 2014. Fuel loading work in the second reactor would take place during the month-end, adding power generation would begin after obtaining requisite permission from the AERB. Construction work for the third and fourth reactors would start this year

Source: <http://www.thehindu.com>, 08 April 2016.

IRAN

Iran Eyes Regional Cooperation on Nuclear Industry

Iran has plans to promote cooperation with the regional countries, particularly the Persian Gulf neighbors, on the employment of nuclear

technology for peaceful purposes, Spokesman for the Atomic Energy Organization of Iran (AEOI) Behrouz Kamalvandi said. In an interview with al-Alam News Network on 10 April 2016, Kamalvandi said the neighboring countries need to immediately set aside the Western-inspired notion of a threat posed by Iran, and called for

the expansion of cooperation even in the field of peaceful nuclear energy. There exist abundant opportunities for cooperation with the neighbors, especially in the Persian Gulf region, he added. Kamalvandi also pointed to a series of plans for closer regional cooperation on the nuclear

industry, saying they will be unveiled in future. More reciprocal visits between Iran and the regional countries will set the ground for cooperation in various nuclear fields, such as medicine and agriculture, he explained. The

spokesman further noted that Iran's centrifuge machines can help development of the region's oil and gas industries at a reasonable price.

Global enthusiasm for nuclear cooperation with Iran has grown after implementation of the JCPOA, a lasting nuclear agreement between Tehran and the Group 5+1.

The deal has enabled Iran to enter the international nuclear trade, leaving it with the option to work with many nuclear countries. France, Spain, South Korea and many other countries have expressed willingness to work with Iran in the nuclear industry.

Source: <http://www.tasnimnews.com>, 11 April 2016.

UAE

UAE's Barakah Nuclear Project 62% Ready

The UAE's Barakah Nuclear Power Plant is more than 62% complete. Emirates Nuclear Energy Corporation (ENEC) is developing the project in Abu Dhabi's Western Region as part of the UAE's peaceful nuclear energy programme. Construction works at Barakah NPP commenced in 2012, and its four nuclear energy units are due for completion in 2020. Unit 1 is over 85% complete, Unit 2 is 67% complete, Unit 3 is 44% complete, and Unit 4 is 27% complete so far. When in operation, the four reactors are expected to deliver a quarter of the UAE's electricity needs, and save up to 12 million tonnes annually in carbon emissions. These announcements were made during a visit made by attendees of the World Nuclear Fuel Cycle conference, state agency WAM said. Dr Mohamed Chookah, ENEC executive director of nuclear fuel procurement, hosted the visit.

Emirates Nuclear Energy Corporation (ENEC) is developing the project in Abu Dhabi's Western Region as part of the UAE's peaceful nuclear energy programme. Construction works at Barakah NPP commenced in 2012, and its four nuclear energy units are due for completion in 2020. Unit 1 is over 85% complete, Unit 2 is 67% complete, Unit 3 is 44% complete, and Unit 4 is 27% complete so far.

giant EDF has been drawing up plans to build the next-generation nuclear power station at Hinkley Point in the southwest of England, but has been hit by a series of deals and the company is yet to make a final investment decision over the project. The project has been hit by financial woes because of a drop in demand for nuclear power since the Fukushima disaster, in March 2011, when a magnitude nine earthquake set off a tsunami that hit the Fukushima Daiichi nuclear plant resulting in the meltdown of three of the plant's six nuclear reactors.

The French energy minister has said that she is seriously considering postponing the construction of a new nuclear power station in the UK, amid cost-overruns and technical difficulties at two of its plants in France and Finland. The largely French state-owned energy giant EDF has been drawing up plans to build the next-generation nuclear power station at Hinkley Point, but has been hit by a series of deals and the company is yet to make a final investment decision over the project.

In a French television interview on 7 April 2016, French energy minister, Ségolène Royal, was asked whether Hinkley Point would be postponed. "It's still under discussion. There's an agreement between France and Britain, so things should go ahead. But the trade unions are right to ask for the stakes to be re-examined. EDF has been struggling to get building underway at Hinkley Point because the sheer cost of building

Source: <http://www.constructionweekonline.com>, 10 April 2016.

NUCLEAR COOPERATION

UK-FRANCE

European Nuclear Plans in Turmoil as French Minister Admits Serious Doubts

The French energy minister, Ségolène Royal, has said that she is seriously considering postponing the construction of a new nuclear power station in the UK, amid cost-overruns and technical difficulties at two of its plants in France and Finland. The largely French state-owned energy

the plant has been a major sticking point, with British taxpayers being forced to back the deal by providing a guaranteed price of generated electricity from the plant. EDF Energy — the UK subsidiary of EDF — agreed a 'strike price' with the UK Government, which guarantees EDF a price of US\$141 MWh for generating electricity over 35 years and a debt guarantee. Despite this, problems with EDF's partner Areva — which manufactures the nuclear reactor — have led to delays in putting finance into place.

French Financial Fears: In 2015, EDF's construction partner, Areva, announced huge losses and the French Government is attempting a rescue plan that will include a bailout from EDF. This is turn

has had a knock-on to Hinkley, where — despite China General Nuclear Power Corporation (CGN) agreeing to pay a third of the cost of the US\$25 billion project in exchange for a 33.5 percent stake — EDF is said to be having trouble raising its 66.5 percent of the cost.

The CEO of EDF, Jean-Bernard Lévy, in September announced a further postponement of the commissioning of the gigantic new nuclear power station at Flamanville in northern France and admitted the price has more than tripled. Lévy said the first French third-generation EPR with a capacity of 1650 MW will cost in the region of US\$12 billion — more than three times the original projected cost of US\$3.37 billion and fuel loading will not even start until late 2018, six years behind schedule. Meanwhile, construction by EDF and Siemens of the Olkiluoto nuclear plant in Finland — based on the same design as Flamanville has also suffered many delays and cost over-runs.

Source: <http://sputniknews.com>, 08 April 2016.

USA-KAZAKSTAN

USA and Kazakhstan Energy Partnership Extends Cooperation

The Kazakhstan-United States Energy Partnership Commission on 7 April 2016 signed a joint statement at a meeting in Kazakhstan that was co-chaired by Kazakh energy minister K A Bosumbayev and US energy secretary Ernest Moniz. The meeting was held as a follow-up to the 11th session of the Special Commission on the Energy Partnership (SCEP), during which discussions were held on nuclear security and nuclear energy, alternative energy and electricity, energy conservation and increasing energy efficiency.

The US DOE said: “Notably, within the framework

of the SCEP, concrete targets have been reached in cooperation in the field of conversion of Kazakhstan's research reactors and enforcement of physical nuclear security.” It added that, also during the past year, experts from the Kazakh energy ministry and the DOE had held bilateral talks on international carbon sequestration and the use of clean technologies. The Republic of Kazakhstan was represented at the session by officials from the Kazakh energy and foreign ministries, state-owned uranium producer KazAtomProm, the Kazenergy Association, KazMunaiGas, Samruk-Energy, EXPO-2017, the National Nuclear Centre, and the Nuclear Physics Institute. US delegates were from the DOE, the US embassy in Kazakhstan and the National Nuclear Security Administration.

After the signing ceremony on 7 April 2016, the two ministers discussed the 2016 work plan, “which encourages the use of alternative energy sources in Kazakhstan, reduces emissions, and enhances nuclear safety”, the DOE said. KazAtomProm and Centrus Energy signed a memorandum of cooperation last October that specifies the development of mutually beneficial relations on competitive supplies of Kazakhstan's uranium to the world market. Bethesda, Maryland-based Centrus Energy supplies enriched uranium fuel for commercial nuclear power plants in the USA and around the world. Earlier, KazAtomProm and ConverDyn signed an agreement whereby the world's largest uranium producer and the “leading provider” of UF₆ conversion services will jointly and immediately offer uranium in the form of natural UF₆ to global utilities. UF₆ is the natural uranium feedstock for the enrichment step in the nuclear fuel cycle.

In 2014, Kazakhstan became the leading supplier of uranium to US nuclear power plants, overtaking

The Kazakhstan-United States Energy Partnership Commission on 7 April 2016 signed a joint statement at a meeting in Kazakhstan that was co-chaired by Kazakh energy minister K A Bosumbayev and US energy secretary Ernest Moniz.

In 2014, Kazakhstan became the leading supplier of uranium to US nuclear power plants, overtaking Australia, according to the US Energy Information Administration. Of the uranium purchased by US reactor owners and operators, 23% was of Kazakh origin, while 20% came from Australia and 18% from Canada.

Australia, according to the US Energy Information Administration. Of the uranium purchased by US reactor owners and operators, 23% was of Kazakh origin, while 20% came from Australia and 18% from Canada.

Source: <http://www.world-nuclear-news.org>, 08 April 2016.

NUCLEAR NON-PROLIFERATION

IRAN

Iran Is Fully Complying With Nuclear Deal: IAEA Chief Yukiya Amano

The Director General of the IAEA, Yukiya Amano, has confirmed that Iran is complying with the terms of the nuclear deal and its obligations under the JCPOA between Tehran and world powers, saying that the deal is a “clear gain for nuclear verification” in the Islamic Republic. “It (Iran) is implementing not just its safeguards agreement with the Agency, but also its Additional Protocol. Transparency measures which go beyond Iran’s obligations under its formal agreements with the IAEA have also been agreed,” Amano told reporters after a two-day summit on nuclear security in Washington. “The JCPOA (Joint Comprehensive Plan of Action) is a clear gain for nuclear verification in Iran,” he added. The Nuclear Security Summit 2016 ended on 1 April, 2016....

It (Iran) is implementing not just its safeguards agreement with the Agency, but also its Additional Protocol. Transparency measures which go beyond Iran’s obligations under its formal agreements with the IAEA have also been agreed,” Amano told reporters after a two-day summit on nuclear security in Washington.

Some politicians in South Korea have called for the return of US nuclear weapons to the peninsula, or even South Korea’s development of its own nuclear capability, as a response to North Korea’s development and testing of nuclear weapons,” the Congressional Research Service said in a report on nonstrategic nuclear weapons.

Source: <http://en.dailypakistan.com.pk>, 02 April 2016.

NUCLEAR PROLIFERATION

SOUTH KOREA

Calls in South Korea for Nuclear Weapons Reflect Views US Security Guarantees are Fragile

Renewed calls in South Korea for the redeployment of US tactical nuclear weapons to

the country or its own nuclear armament reflect concerns that US security guarantees are “fragile,” a US congressional report said. The North’s fourth nuclear test in January and its long-range rocket launch in February have led some leading members of South Korea’s ruling party to make the case for nuclear armament, arguing that it makes no sense to rely on the US “nuclear umbrella” as the North’s nuclear arsenal grows.

But the government rejected the idea as contrary to the principle of a nuclear-free Korean Peninsula. “Some politicians in South Korea have called for the return of US nuclear weapons to the peninsula, or even South Korea’s development of its own nuclear capability, as a response to North Korea’s development and testing of nuclear weapons,” the Congressional Research Service said in a report on nonstrategic nuclear weapons. “This view has not received the support of the current government in South Korea, but it does demonstrate that some may see US security guarantees as fragile,” it said.

The report also said that the debate over the relationship between US nuclear weapons and non proliferation policy has also focused on extended deterrence and the

assurances the United States provides to its allies. Many analysts have argued that, if these allies were not confident in the reliability and credibility of the US nuclear arsenal, they may feel compelled to acquire their own nuclear weapons, it said. Such a view is evident among analysts who express concerns that Turkey, in particular, with its proximity to Iran, might pursue its own nuclear weapons if the United States were to withdraw its tactical nuclear weapons from Europe, the report said. “Such calculations might also be

evident in Japan and South Korea, as they face threats or intimidation from nuclear-armed neighbors like China and North Korea," it said.

Calls for South Korea's nuclear armament were fueled by US Republican presidential front-runner Donald Trump's suggestion that he could allow the Asian ally to develop its own nuclear arsenal for self-defense in order to reduce US security burdens. But the suggestion has since been strongly denounced as contrary to non-proliferation principles. US President Barack Obama has also openly criticized Trump, saying the statements about nuclear armament "tell us that the person who made the statements doesn't know much about foreign policy or nuclear policy or the Korean Peninsula or the world generally." Secretary of State John Kerry also slammed the suggestion, saying nothing can be "more volatile" or "more contrary" to peace and stability.

Source: <http://www.koreatimes.co.kr>, 11 April 2016.

NUCLEAR SAFETY

JAPAN

Japan Hosts First International Forum on Decommissioning Fukushima Plant

The 1st International Forum on the Decommissioning of the Fukushima Daiichi nuclear power plant began on 10 April, 2016, in north eastern Japan with the aim of promoting advances in the long process of putting a lid on the 2011 nuclear crisis. The two-day forum is being hosted by the Ministry of Economy, Trade and Industry in Iwaki,

Calls for South Korea's nuclear armament were fueled by US Republican presidential front-runner Donald Trump's suggestion that he could allow the Asian ally to develop its own nuclear arsenal for self-defense in order to reduce US security burdens. But the suggestion has since been strongly denounced as contrary to non-proliferation principles.

Fukushima Prefecture, some 40 kilometers from the plant where the nuclear disaster struck on March 11, 2011, as a result of an earthquake and a tsunami. "The main aim of the event includes prominently technical fields such as decommissioning and residue management," said Spanish national Juan Carlos Lentijo, deputy director general of the IAEA. "It deals with sharing experience and knowledge with an eye on perfecting and orienting the decommissioning tasks at the Fukushima plant (estimated to take three to four decades) and which can be used in the future in other installations," he added.

The forum will deal with the evaluation of risks encountered in the operations at the Fukushima plant, and analysis of possible strategies to remove the melted fuel, the most complex task in the whole process. "It will also deal with understanding what occurred and learning lessons from it," said Lentijo, who also heads the IAEA Department of Nuclear Safety and Security. At the forum, Lentijo went over all the Fukushima-related activities undertaken by his organization after the accident, including decontamination inside and outside the plant.

The main aim of the event includes prominently technical fields such as decommissioning and residue management," said Spanish national Juan Carlos Lentijo, deputy director general of the IAEA. "It deals with sharing experience and knowledge with an eye on perfecting and orienting the decommissioning tasks at the Fukushima plant (estimated to take three to four decades) and which can be used in the future in other installations.

The forum, which was attended William D. Magwood IV, director-general of the OECD Nuclear Energy Agency, also seeks to promote advances in research and development for decommissioning work through the use of machinery and robots. In this regard, representatives from leading firms and research centers are also participating in the meet. Lentejo then went on to underline the importance of

“improving communication” between the nuclear industry and the public. “Public acceptance is crucial. The people want to know about the advances regarding the Fukushima case, or what risks persist with regard to safety and it is important to correctly transmit this information,” he said.

Source: <http://www.laht.com>, 11 April 2016.

NUCLEAR SECURITY

GENERAL

UN Treaty to Protect Nuclear Materials from Terrorists Takes Effect in May

More than 100 countries will have to implement more robust standards to safeguard nuclear materials and facilities as of May, the UN’s IAEA announced. Nicaragua ratified a decade-old amendment to the Convention on the CPPNM, bringing the number of countries to ratify the bill to 102, meaning the amendment passed the two-thirds threshold to go into effect. The CPPNM entered into force in 1987 and addressed the physical protection of peaceful-use nuclear material during international transport. The amendment goes further by requiring countries to protect nuclear facilities and material used domestically, including storage and transport. “This is an important day for efforts to strengthen nuclear security around the world,” said IAEA Director General Yukiya Amano in a statement. The amendment “will help reduce the risk of a terrorist attack involving nuclear material, which could have catastrophic consequences.”

The updated convention broadens current offenses for the theft of nuclear material and

identifies new offenses such as the smuggling of nuclear material and sabotage of nuclear facilities or material. It also obliges countries to cooperate and share intelligence to relocate and retrieve lost or stolen nuclear materials.

Over the past two decades, there have been nearly 3,000 cases of nuclear material disappearing, being illegally trafficked or found in the possession of unauthorized individuals, according to the IAEA. While in most instances the nuclear material could not be used to create a nuclear bomb, in some cases it could be used for a dirty bomb designed to disperse radioactive material.

Source: <http://www.dw.com>, 08 April 2016.

Over the past two decades, there have been nearly 3,000 cases of nuclear material disappearing, being illegally trafficked or found in the possession of unauthorized individuals, according to the IAEA. While in most instances the nuclear material could not be used to create a nuclear bomb, in some cases it could be used for a dirty bomb designed to disperse radioactive material.

Nuclear Security Agreement Efforts “Have Now Paid Off” Says IAEA Director

A new nuclear security agreement finally came into effect on 8 April 2016, more than a decade after it was drafted. The IAEA said that the nuclear agreement showed its efforts “have now paid off”. The Amendment to the 1980 CPPNM was drafted in 2005 but could not come into force until it was ratified by two thirds of the States who were party to it. More than a decade after it was agreed upon at the second Diplomatic Conference, the Amendment to the CPPNM will come into effect.

The Director General of the IAEA, Yukiya Amano, said it was “an important day for efforts to strengthen nuclear security around the world. One hundred and two

Yukiya Amano, said it was “an important day for efforts to strengthen nuclear security around the world. One hundred and two countries have now deposited their instruments of ratification, acceptance or approval of the Amendment to the Convention on the Physical Protection of Nuclear Material. It will help reduce the risk of a terrorist attack involving nuclear material, which could have catastrophic consequences.

countries have now deposited their instruments of ratification, acceptance or approval of the Amendment to the Convention on the Physical Protection of Nuclear Material. It will help reduce

the risk of a terrorist attack involving nuclear material, which could have catastrophic consequences.” The Amendment makes it legally binding for countries to protect nuclear facilities, as well as nuclear material in domestic use, storage and transport. It will also increase international cooperation in locating and recovering stolen or smuggled nuclear material.

The IAEA has worked hard in the last few years to encourage countries to adhere to the Amendment. Our efforts have now paid off. The Amendment will become legally enforceable on 8 May, 2016.

Source: <http://m.gbcghana.com>, 10 April 2016.

SINGAPORE

Singapore to Beef Up Nuclear Security, PM Lee Says

Tighter checks on radioactive materials passing through its ports and a new facility that can conduct radiation-nuclear detection and analysis are some of the steps Singapore has taken, says Prime Minister Lee Hsien Loong. Singapore will roll out tighter controls to detect and analyse radioactive and nuclear materials passing through its borders, Prime Minister Lee Hsien Loong said. PM Lee said this at the 4th NSS in Washington, DC on 1 April, 2016, where more than 50 countries shared their progress in strengthening nuclear security.

Since the first NSS in 2010, Singapore has tightened checks on radioactive materials passing through its ports, with every case of nuclear fuel transiting through Singapore being tracked. “From time to time, we have intercepted cargo and confiscated items,” Mr Lee said. He said that Singapore had recently discovered a significant amount of thorium - a radioactive element which

Singapore had recently discovered a significant amount of thorium - a radioactive element which can be used as nuclear fuel. A laboratory called the Protective Analytical and Assessment Facility (PAAF), plans for which were first announced in 2011, will also be ready this year.

can be used as nuclear fuel. A laboratory called the Protective Analytical and Assessment Facility (PAAF), plans for which were first announced in 2011, will also be ready this year. The lab, located at Pasir Panjang, will be able to conduct radiation-nuclear detection and analysis. On top of that, the city-state also cooperates with international partners such as the Interpol Global

Complex for Innovation in Singapore, which fosters the sharing of data about transnational threats among countries. Singapore also participates in the Proliferation Security Initiative – a global effort that combats the trafficking of weapons of mass destruction. It also adopts the recommendations of the Financial Agency Task Force, which is an intergovernmental body that fights against money laundering and terrorism funding.

With the world becoming increasingly vulnerable to terrorism, a nuclear attack by terrorists using devices bought from the black market is “very plausible and believable”, and is a threat which countries must take seriously, Mr Lee said. In its

With the world becoming increasingly vulnerable to terrorism, a nuclear attack by terrorists using devices bought from the black market is “very plausible and believable”, and is a threat which countries must take seriously, Mr Lee said.

Dabiq magazine published last May, the Islamic State militant group had described such a scenario – where it launches a major attack with devices from the black market, Mr Lee said, urging the global community to continue fighting against

nuclear terrorism. ...Mr Lee said, adding that Singapore also takes a serious view of the issue. Since the NSS began in 2010, more than 3.8 metric tons of nuclear materials have been removed globally. This amount could be used to make more than 150 nuclear weapons.

... Mr Lee also touched on the region’s plans for nuclear power plants. Vietnam and Indonesia are among the ASEAN countries planning to develop such facilities.

Nuclear power plants are not in itself a security issue, he said. "The risk is safety and in case of sabotage or theft of material, then we have a problem. That's why we are building up our capabilities to understand nuclear safety and that's why we participate in conferences like this, because the security part requires international cooperation."....

Nuclear power plants are not in itself a security issue, he said. "The risk is safety and in case of sabotage or theft of material, then we have a problem. That's why we are building up our capabilities to understand nuclear safety and that's why we participate in conferences like this, because the security part requires international cooperation."

Source: <http://www.channelnewsasia.com>, 02 April 2016.

NUCLEAR DISARMAMENT

GENERAL

G-7 Foreign Ministers Push Nuclear Disarmament in Hiroshima

The Hiroshima declaration aims to revitalise the momentum for the effort toward making a world without nuclear weapons. They also condemned recent terrorist attacks in a range of countries Turkey, Belgium, Nigeria, Ivory Coast and Pakistan and pledged to complete a G7 action plan to counter terrorism that the leaders of their nations can adopt at their summit in late May. The ministers also condemned "in the strongest terms" this year's nuclear test and rocket launch by North Korea, and a subsequent series of missile launches. They renewed their condemnation to what they called Russia's "illegal annexation" of the Crimean peninsula in Ukraine, and urged Russia to observe the recent Minsk agreement to resolve the dispute. Meeting in Hiroshima, which was devastated by an American atomic bomb in 1945, the issue of nuclear non-proliferation took on special significance at the annual meeting of the top diplomats from Britain,

They issued two statements on 11 April on non-proliferation, including one dubbed the "Hiroshima Declaration" that calls on other leaders to follow their path to Hiroshima. "In this historic meeting, we reaffirm our commitment to seeking a safer world for all and to creating the conditions for a world without nuclear weapons," the statement said.

Canada, France, Germany, Italy, Japan and the US

US Secretary of State John Kerry became the highest-ranking American official to visit Hiroshima since World War II when the foreign ministers visited the Hiroshima peace memorial cenotaph to lay flowers for the victims of the American

atomic bombing in 1945. They issued two statements on 11 April on non-proliferation, including one dubbed the "Hiroshima Declaration" that calls on other leaders to follow their path to Hiroshima. "In this historic meeting, we reaffirm our commitment to seeking a safer world for all and to creating the conditions for a world without nuclear weapons," the statement said. It also said the task is made more complex by the deteriorating security environment in countries such as Syria and Ukraine, as well as by North Korea's "repeated provocations." The Hiroshima declaration aims to revitalise the momentum for the effort toward making a world without nuclear weapons, said Yasuhisa Kawamura, the Japanese Foreign Ministry press secretary.

Source: <http://www.thehindu.com>, 11 April 2016.

NUCLEAR TERRORISM

BELGIUM

Brussels Attacks Renew Concerns over Global Nuclear Security

As Belgian authorities continue an expansive international investigation following terrorist attacks in Brussels that killed 32 people, new scrutiny is being given to security lapses that have occurred over the years at the country's nuclear facilities. Such concerns had already been raised in Belgium following the

November Paris attacks, when a video retrieved in raids from the home of a suspected Islamic State supporter showed the country's nuclear research program director was being monitored at his residence.

Belgian officials said the country has strengthened protections for its nuclear facilities. They cited an aegis that involved the installation of armed guards and a fortified vetting process for employees of the country's two nuclear plants, which combined produce roughly 60 percent of the country's electricity. Belgian officials also ruled out any link between the Islamic State and an employee of one of the country's two main nuclear facilities who was murdered in March. The claim that the country was on a path to improved security was supported by a report released by Harvard University Belfer Center for Science and International Affairs researchers.

he report reads: In December 2014, the Belgian nuclear regulator imposed substantial new requirements for protection against insider threats, including strengthened access controls, deployment of additional cameras to monitor activities in key areas of plants, and new two-person rule requirements forbidding anyone from being alone in specified plant area. But the 166-page report also shed new light on examples of security issues at Belgium nuclear facilities, including a 2014 incident of "nuclear sabotage" when someone opened a locked valve and drained a lubricant that caused a reactor to be shut down. A suspect was never found in the incident, which cost \$100 million to repair. The report also found at least one other former employee of a Belgian nuclear facility left

his position to join ISIS in Syria sometime after 2012.

Matthew Bunn, a former White House adviser and a Harvard University professor who worked on the report, said in an interview with the PBS News Hour that there is still a succession of unanswered questions about security incidents at Belgian facilities. "I think they can say 'we really took serious action,'" Bunn said. "They also have some things that are still not fully explained."

In an interview, Page Stoutland, vice president of scientific and technical affairs at the Nuclear Threat Initiative, an organization that has

monitored and ranked risks to nuclear sites in 45 countries since 2012, said Belgium was on its way to greater security, but still had a few areas where the country isn't "up to snuff." "They still have procedures to screen employees as insiders that are really not as comprehensive as other countries and until very recently they did not have armed guards at the site," he said. "Belgium was one of the roughly half of the countries that do not have cyber security in place." In Washington D.C. world leaders met for a Nuclear Security Summit, the

fourth international gathering on the topic since 2010. Stoutland said despite some improvements to international nuclear security protocol since the advent of President Barack Obama's biannual summits, gaps remain in Belgium and around the world. "There's

no question that the momentum is sort of slowing on this agenda," he said. "There are still seven countries that don't have armed guards at nuclear sites, half of the countries have no laws pertaining to cyber security and there's still a number of countries whose quantities of nuclear material are going up."

Belgian officials said the country has strengthened protections for its nuclear facilities. They cited an aegis that involved the installation of armed guards and a fortified vetting process for employees of the country's two nuclear plants, which combined produce roughly 60 percent of the country's electricity.

There's no question that the momentum is sort of slowing on this agenda," he said. "There are still seven countries that don't have armed guards at nuclear sites, half of the countries have no laws pertaining to cyber security and there's still a number of countries whose quantities of nuclear material are going up.

Speaking at a press conference 8 April, Obama lauded the “coordinated efforts” of the 50 heads of states in attendance, but called for better security and the removal of fissile material at some of the roughly 400 nuclear facilities existing around the world. “We know that al Qaida has long sought nuclear materials. Individuals involved in the attacks in Paris and Brussels videotaped a senior manager who works at a Belgian nuclear facility. ISIL has already used chemical weapons, including mustard gas, in Syria and Iraq,” he said. “There is no doubt that if these madmen ever got their hands on a nuclear bomb or nuclear material they most certainly would use it to kill as many innocent people as possible.”

Source: <http://www.pbs.org>, 03 April 2016.

GERMANY

Paris Terrorist was Eyeing German Nuclear Centre

Salah Abdeslam had documents at his apartment about a nuclear research centre at Jülich in North Rhine-Westphalia, raising concerns for authorities about what he many have been planning on German soil. The documents included articles printed out from online sources about the research facility, as well as photos of the centre’s head, Wolfgang Marquardt, newspapers under the publishing group Redaktionsnetzwerk Deutschland (RND) reported, citing members of a parliamentary panel.

Abdeslam is currently being held in a Belgian prison, waiting to be deported to France, where he will face trial for terrorism offences in

connection with the November 13th Paris attacks that left 130 dead. The most recent documents were reportedly found inside of Abdeslam’s apartment where the French national was arrested last month in the Molenbeek district of Brussels.

Just days later, three bombs went off in Brussels in a coordinated terror attack that killed 32 people.

German domestic intelligence (Verfassungsschutz) President German Hans-Georg Maaßen reportedly informed several members of a Bundestag (German Parliament) security committee last month about the findings. But

according to RND, the Chancellery and the Interior Ministry declared that they did not have any information about the documents. Similar information about the Brussels terrorists monitoring a Belgian nuclear scientist several weeks ago fueled speculation that they could have been planning to somehow get radioactive material for a dirty bomb, perhaps by blackmailing the researcher. They reportedly spied on the researcher, including filming him at his home for hours.

Immediately after the Brussels attacks, a Belgian nuclear power plant was evacuated of all non-essential personnel. Officials were also concerned when it emerged that two former Belgian nuclear power plant workers had gone to Syria to fight with Isis, one of whom was killed. German

nuclear power plants are extensively protected against the possibility of any interferences or other actions by an outside person, including terror attacks, according to the German Environment Ministry. But according to environmental NGO BUND, the reactors are not

We know that al Qaida has long sought nuclear materials. Individuals involved in the attacks in Paris and Brussels videotaped a senior manager who works at a Belgian nuclear facility. ISIL has already used chemical weapons, including mustard gas, in Syria and Iraq,” he said. “There is no doubt that if these madmen ever got their hands on a nuclear bomb or nuclear material they most certainly would use it to kill as many innocent people as possible.

Immediately after the Brussels attacks, a Belgian nuclear power plant was evacuated of all non-essential personnel. Officials were also concerned when it emerged that two former Belgian nuclear power plant workers had gone to Syria to fight with Isis, one of whom was killed.

sufficiently safe enough against air attacks.

Source: <http://www.thelocal.de/20160414/paris-attacks-ringleader-had-records-of-german-nuclear-plant>, 14 April 2016.

SAUDI ARABIA

Riyadh Donates \$10m for Center to Fight Nuclear Terror

Saudi Arabia donated on 2 April, 2016, \$10 million to set up a special center to fight nuclear terrorism at the IAEA in Vienna. The Kingdom also donated 500,000 euros for the modernization of the agency's laboratories in Seibersdorf. Saudi Arabia is one of the first countries to support international resolutions on nuclear safety, giving priority to the issue of developing and improving infrastructure. This was stated in a speech delivered by Dr. Hashim bin Abdullah Yamani, chairman of the King Abdullah City for Atomic and Renewable Energy, and head of the Saudi delegation at the 4th Nuclear Safety Summit held in Washington. He said: "The Kingdom is one of the first countries to have supported international resolutions related to nuclear safety.

The Kingdom has also approved the Convention of Physical Protection of Nuclear Material, and supported initiatives in the fight against nuclear terrorism. It is part of the international treaty to eradicate nuclear terrorism." Dr. Yamani said that the Kingdom has always been actively and positively ready in most of international activities related to nuclear safety since the first summit was held in Washington, D.C., in 2010...has made it a priority to support development of infrastructure related to nuclear safety by understanding the integration between nuclear safety, security and work on the inclusion of nuclear security as one of the components of

Saudi Arabia donated on 2 April, 2016, \$10 million to set up a special center to fight nuclear terrorism at the IAEA in Vienna. The Kingdom also donated 500,000 euros for the modernization of the agency's laboratories in Seibersdorf.

I urge all to support and strengthen the technical and human possibilities of the International Atomic Energy Commission by setting up of a special center to fight against nuclear terrorism in Vienna. On the occasion, I am announcing that the Kingdom is giving an amount of \$10 million to set up the center.

the nuclear supervision board being set up in the Kingdom...will continue to activate the strategic partnership with the Nuclear and Radiation Safety Authority in Finland to give necessary support to regulate the nuclear energy sector in the Kingdom and development of the human resources required for setting up the independent national authority for nuclear supervision. He said that at the international level, the Kingdom has supported international activities in the area of nuclear safety.

In 2014, it announced a donation of \$100 million to set up an anti-terrorism center at the United Nations. "I urge all to support and strengthen the technical and human possibilities of the International Atomic Energy Commission by setting up of a special center to fight against nuclear terrorism in Vienna. On the occasion, I am announcing that the Kingdom is giving an amount of \$10 million to set up the center. At the same time, I am happy to announce the support of the Kingdom for the modernization of the laboratories of the agency in Seibersdorf with an amount of 500,000 euros," said Yamani. Dr. Yamani said that the Kingdom has already announced its intention to develop a nuclear program to use nuclear energy for peaceful purposes to achieve the objective of sustainable development. While doing this, the Kingdom is complying with all requirements for nuclear safety. For the purpose the Kingdom is committed to developing a national system for monitoring and control of nuclear and radiological material. It will also make efforts to develop customs and border guarding system to prevent illegal trade of dangerous materials.

Source: <http://www.arabnews.com/>, 03 April 2016.

URANIUM PRODUCTION

GENERAL

Is Uranium the New Gold?

Energy metals are garnering much investor attention and one analyst familiar to the space remains optimistic. Commenting on uranium prices, which have yet to move higher, Chris Berry of House Mountain Partners said he still sees a case for the metal. 'In the wake of recent climate agreements, countries loosely agree to decarbonize their energy source and uranium is going to have to play a significant role in that mix,' he told Kitco News.

'In the next 18-24 months, you can see uranium prices 30% higher from where they are today.' Berry is also optimistic on lithium, although he advises investors to remain cautious over the shorter term. 'The price has absolutely gone parabolic and from my experience in energy metals, any time you see prices go parabolic, it usually ends in tears,' he says. 'So you want to be careful...it's a good long-term story but it's been on a huge run over the few months.'...

Source: <http://www.uranium-stocks.net/home/is-uranium-the-new-gold.html>, 13 April 2016.

NUCLEAR WASTE MANAGEMENT

CANADA

NWMO Says Managing Used Nuclear Fuel is an Ethical Issue, Not Spatial

With an updated project description for its underground used nuclear fuel facility, Canada's Nuclear Waste Management Organization (NWMO) is working on the ethical dilemma nuclear disposal poses to the country. "From a volume perspective it is not something that is a big problem," said NWMO communications

manager Mike Krizanc. "... We have an ethical responsibility to deal with the waste we have produced." Each year Canada's nuclear power plants produce 90,000 used nuclear fuel bundles in the process of creating nuclear-based electricity.

Once depleted of usable energy, these uranium fuel bundles, which remain highly radioactive for millions of years, are cooled in pools for a decade before being procedurally packed in dry storage canisters. These canisters are then lined in warehouses, vaults or silos at the nation's CANDU reactor sites located in Ontario, New Brunswick and Quebec. At the Bruce nuclear site, which houses 60 per cent of Canada's used nuclear fuel bundles at Ontario Power Generation's (OPG) Western Waste Management Facility (WWMF), the warehouse is expected to reach capacity by 2020.

At the Bruce nuclear site, which houses 60 per cent of Canada's used nuclear fuel bundles at Ontario Power Generation's (OPG) Western Waste Management Facility (WWMF), the warehouse is expected to reach capacity by 2020.

However, more warehouses can be erected, Krizanc said. "There's no way anybody is running out of any kind of room to keep these," Krizanc said, explaining that the entirety of the nation's

nuclear fuel bundles stacked like cordwood would fill only seven hockey rinks to the top of the boards. The problem, Krizanc said, is not one of space, but of ethics and it is the responsibility of the generation that reaps the benefits of nuclear power to cover the costs. In 1998 after years of study, the federal government approved a plan to bury all 4.4 million used nuclear fuel bundles that Canada's power plants will produce during their life expectancy hundreds of meters underground. Though studies have shown the repository to be technically safe, low public acceptance of the plan had prevented it from moving forward causing the federal government to found the NWMO in 2002. Since then, the NWMO has been working to find a suitable host community for the used fuel through public consultations.

Nine sites including Huron-Kinloss, South Bruce

and Central Huron are currently being sized for the NWMO's deep geological repository for used nuclear fuel. This number was whittled down from an original 21 interested cities. Some anti-nuclear activists and environmentalists criticize the project as unsafe and unethical. However, the NWMO rejects this attitude as obstructionist, stating the nuclear waste that already exists must be dealt with professionally and responsibly. Leaving the bundles on the Earth's surface, Krizanc said, "is basically driven by people who are opposed to nuclear power who want to be able to argue there is no plan for the waste. [The NWMO] is not here to promote or penalize nuclear power," he said. "... We're here because the used fuel exists and regardless of the decisions that are made it has to be managed."

Over breakfast April 4, the NWMO's vice president of design and construction Derek Wilson told Kincardine News that they have recently released an updated project description. First published and publicized in 2011, the project was modeled primarily from Swedish and Finnish designs. The latest plan has been tailored to Canada's CANDU reactors, which use fuel bundles three-quarters the size and weight of the Scandinavian bundles. "So what we've looked at is optimizing our container design for CANDU [used nuclear] fuel," he said. And this container of steel and copper has "greatly influenced" the project's entire design, he said, causing Wilson and his team to model a multi-layered barrier system to contain the dangerous bundles.

With this new multi-barrier containment system

the used nuclear fuel bundles are encased in the copper-coated steel canisters, which are then packed in bentonite clay blocks. This entire process is done above ground at the site's processing plant before the bundle is shuttled approximately 500 meters below the earth where it is then buried in channels cut into the sedimentary rock. It is then packed into place with more of this clay, which expands when it comes into contact with water. The multi-barrier

With this new multi-barrier containment system the used nuclear fuel bundles are encased in the copper-coated steel canisters, which are then packed in bentonite clay blocks. This entire process is done above ground at the site's processing plant before the bundle is shuttled approximately 500 meters below the earth where it is then buried in channels cut into the sedimentary rock.

system won Chris Hatton, NWMO president of design and construction, the 2015 Innovative Achievement Award, which was the first time the honour had been handed out since 2012. The layout of the repository will cover 340 hectares, or a roughly 3km by 2km square footprint underground. Its life-cycle costs will be published in the near future, Wilson said, and testing of the containers is now in its third year.

We have a responsibility. We can't leave this at the surface forever and ever. We have a responsibility because we don't know what society is going to be like in 10,000 years, 5,000 years from now. And we can't expect future generations to continually pay and look after this used nuclear fuel," he said.

Meanwhile the NWMO has divided site selection process into nine steps with the final step being the start of construction. The project is currently at the third phase of step two, preliminary assessment, which Krizanc said NWMO hopes to complete by 2023. The preferred site will be

identified in step six....No bore holes have yet been drilled to examine the host rock of any of the vying nine communities.

The NWMO is currently planning to drill, but not for at least a year. "We will only move forward with this project if it will contribute to the long-term well being of the community," said Krizanc. And it's for the community to decide what that means, he said. "If you go out and ask people

who don't have an axe to grind they will tell you we have a responsibility. We can't leave this for our children and grandchildren," he said. "We have a responsibility. We can't leave this at the surface forever and ever. We have a responsibility because we don't know what society is going to be like in 10,000 years, 5,000 years from now. And we can't expect future generations to continually pay and look after this used nuclear fuel," he said.

Source: <http://www.kincardineneews.com>, 10 April 2016.

SWEDEN

Nuclear Waste Ship MV Sigrid Runs Aground in Sweden

A Swedish cargo ship designed to haul radioactive waste ran into a little trouble on 8th April, 2016, outside the harbor of a decommissioned nuclear power plant in southeastern Sweden. The Swedish Maritime Administration confirmed that the MV *Sigrid* had a pilot on board when it ran aground at about 8 a.m. as it approached the Barsebäck nuclear power plant. The ship was not carrying any dangerous cargo, the administration and the ship's owner confirmed.

Wind at the time was about 10 to 12 knots. A tugboat, two coast guard vessels and a ship inspector from the Swedish Transport Agency were sent to assist the vessel, confirming that no oil was leaking from the ship. By noon, a tug was able to free the *Sigrid* and pull it into deeper water.

Within a few hours, divers were able to confirm that there was no damage to ship's hull or propellers.

The cause of the grounding is under investigation. The nuclear cargo vessel MV *Sigrid* was delivered in 2013 by Damen's Galati Shipyard in Romania to the Swedish Nuclear Waste Management Company (SKB). The ship was designed to

transport radioactive material from Swedish nuclear power plants to SKB's facilities in Oskarshamn and Forsmark. The vessel can transport up to 12 nuclear waste containers, as well as standard cargo containers or special trucks. The Barsebäck Nuclear Power Plant has two reactors that have been decommissioned since 1999 and 2005, respectively.

Source: <http://gcaptain.com>, 08 April 2016.

USA

Court Awards Maine Yankee \$24.6 Million to Pay for Storing Radioactive Waste

The owners of Maine Yankee have been awarded nearly \$25 million in their latest lawsuit against the federal government for its failure to remove spent nuclear fuel from the site of the former nuclear power plant in Wiscasset. In a decision issued on 7 April 2016, US Court of Federal Claims Judge James H. Merow also awarded damages to the owners of closed Yankee nuclear power plants in Connecticut and Massachusetts, ruling that the federal government hasn't fulfilled its contractual

obligation to remove spent fuel from those sites as well.

The owners of Maine Yankee are due \$24.6 million, the owners of the Connecticut plant were awarded \$32.6 million and the owners of the Massachusetts plant were awarded \$19.6 million. The

lawsuit covers the period from 2009 to 2012. The federal government has 60 days to appeal the ruling. Maine Yankee uses the money from the awards to maintain the Wiscasset site, where 60 cannisters of spent fuel and four cannisters of irradiated steel are stored. The plant was shut down in 1997 and the federal government was supposed to start removing spent fuel in 1998, but Congress has never been able to agree on

A Swedish cargo ship designed to haul radioactive waste ran into a little trouble on 8th April, 2016, outside the harbor of a decommissioned nuclear power plant in southeastern Sweden. The Swedish Maritime Administration confirmed that the MV *Sigrid* had a pilot on board when it ran aground at about 8 a.m. as it approached the Barsebäck nuclear power plant.

where to locate a facility to store the spent radioactive fuel.

The award is the third for the three Yankee nuclear plants, which share some ownership and management but are separate companies, said Eric Howes, director of public and government affairs for Maine Yankee. In the past two lawsuits, Maine Yankee was awarded a total of \$117.5 million in damages. The government appealed the first ruling, Howes said, but didn't appeal the second...it costs about \$10 million a year to store the waste in Wiscasset. He said he expects the owners of Maine Yankee, which include Central

Maine Power and Emera Energy in Maine, to file another lawsuit to recover damages for the period since 2013...the periodic damage awards mean that Maine Yankee has not needed ratepayer money to operate the site...the utilities support a proposal to set up a pilot program to remove the fuel from the former nuclear plant sites to an interim storage facility until Congress establishes a permanent storage site. That plan is pending in Congress.

Source: <http://www.pressherald.com>, 08 April 2016.



Centre for Air Power Studies

The Centre for Air Power Studies (CAPS) is an independent, non-profit think tank that undertakes and promotes policy-related research, study and discussion on defence and military issues, trends and developments in air power and space for civil and military purposes, as also related issues of national security. The Centre is headed by Air Marshal Vinod Patney, SYSM PVSM AVSM VrC (Retd).

Centre for Air Power Studies

P-284

Arjan Path, Subroto Park,
New Delhi - 110010

Tel.: +91 - 11 - 25699131/32

Fax: +91 - 11 - 25682533

Email: capsnetdroff@gmail.com

Website: www.capsindia.org

Edited by: Director General, CAPS

Editorial Team: Hina Pandey, Arjun Subramanian P, Chandra Rekha, Manisha Chaurasiya, Deep Jyoti Barman

Composed by: CAPS

Disclaimer: Information and data included in this newsletter is for educational non-commercial purposes only and has been carefully adapted, excerpted or edited from sources deemed reliable and accurate at the time of preparation. The Centre does not accept any liability for error therein. All copyrighted material belongs to respective owners and is provided only for purposes of wider dissemination.