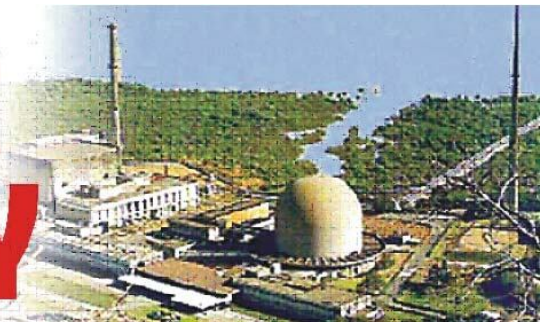
NUCLEAR SECURITY



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

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OPINION – Manpreet Sethi

India's NFU Strategy – Sane and Safe

Recently, India's Defence Minister was asked a question by a young girl on how India proposed to protect her in case of nuclear war. Since India has a NFU nuclear doctrine, it means it will take the first nuclear hit, she surmised, and wanted to know what civil defence measures the state was planning to put in place. All that was necessary to reassure her and a billion plus other Indians was for the Defence Minister to point out that India's credible nuclear deterrent was the country's protection. The promise of *punishment through nuclear retaliation* for any nuclear misadventure by an adversary was how India sought to protect itself. Civil defence measures have never protected any nation and even the US and USSR gave up on building bomb shelters for defence since these were found to be inadequate. Deterrence, it was realized, was the best defence. India is engaged in building the same.

The promise of *punishment through nuclear retaliation* for any nuclear misadventure by an adversary was how India sought to protect itself. Civil defence measures have never protected any nation and even the US and USSR gave up on building bomb shelters for defence since these were found to be inadequate. Deterrence, it was realized, was the best defence. India is engaged in building the same.

Instead of providing this simple answer, the Minister ended up expressing a 'personal opinion' on India's subscription to NFU. He expressed doubts about its wisdom, thereby setting off an outpouring from those dissatisfied with the NFU. This strategy is criticized for leaving India open to nuclear strike and for projecting the country as weak and passive since it appears to have handed over the initiative to the adversary. Historical inclination towards Gandhian non-violence is invoked to explain this defensive strategy and the eschewing of proactivism is rued. Such an understanding of the NFU strategy is, however, way off the mark. The logic of NFU runs much deeper.

NFU, in fact, reflects the confidence of a nation to *dare the adversary* to use his nuclear weapons first. And, this really is a dare for two reasons. One, common sense tells us that a nuclear first use can be beneficial only when the first user is able to disarm or decapitate the adversary so that no retaliation is forthcoming. But,

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when the adversary has secure second strike capabilities (China, India, and Pakistan do), then the first use would surely bring back pain of nuclear retaliation. For a small country like Pakistan, it could well be suicidal. For India and China, it would push their economic growth and development back by many years. So, if after the first use, the country has not been able to improve its material and political situation, what purpose has the use served? The second reason why first use by any country would constitute a challenge is because a taboo against the use of nuclear weapons is pretty much in place today. None can afford to be cavalier in breaking the norm since the act of the use of nuclear weapons would bring immense international opprobrium.

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In contrast to this, the NFU is actually a liberating strategy. For one, it places far fewer and less stringent material and system demands of early warning, launch logistics, and command and control structures. For instance, to be credible, first use must be able to project an ability to fight a war of attrition and prevail. This requires large arsenals of first strike weapons (such as accurate missiles with multiple independently retarget able vehicles), nuclear superiority to carry out counterforce attacks against adversary's retaliatory forces, elaborate and delegated command and control structures to coordinate simultaneous nuclear attacks from and over dispersed forces.

The NFU has actually made India more, not less, safe. Can any adversary afford to use its weapons when retaliation from India will be massive and certain? A first use strategy amounts to tilting at windmills. And India would be falling into the same trap if it chose to adopt a first use strategy. The NFU, on the other hand, reflects a quiet, calming confidence. But unfortunately, we in our own country have not understood the deep wisdom and the many benefits of the NFU strategy.

None of this is easy, or cheap, or even conducive for own safety. Rather, maintaining nuclear forces in a state of readiness for first use raises the possibility of an accidental nuclear war due to a miscalculation or unauthorized launch. Secondly, in case of NFU the political leadership is freed from the psychological pressure of making the difficult choice of when or how early to use the weapon, especially when it has to be done in the knowledge that retaliation can yet not be escaped. Can any rational leader live with the weight on his conscience of the nuclear annihilation that he caused? Comparatively, the decision of retaliation would be far easier, seemingly legitimate, and more guilt-free to make.

A third benefit of NFU is that it helps to mitigate the "use or lose" pressure on the adversary and thereby lessens crisis instability. The adversary need not be on edge at all times fearing the first use from the other side. Lack of such pressure can contribute to better thought out decisions in crises rather than hasty actions that assume the worst. This can tilt the balance in favour of nuclear weapons not coming into use at all, meeting thereby the objective of nuclear weapons, which is deterrence.

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Source: http://www.thedialogue.co/, 23 December 2016.

OPINION – Hina Pandey

Banning the Bomb: India will Wait and See

In October 2016, the UNGA adopted a resolution to convene worldwide negotiations, on a "legally binding instrument to prohibit nuclear weapons, leading towards their total elimination" in 2017. If successful, this would mean the first concrete step towards a world free of nuclear weapons, especially after the failed NPT RevCon 2015.This indeed, is a huge victory for the non-proliferation lobbies worldwide, however, the endeavor might suffer due to lack of support from the NWS.

Will India Participate? ... All three nuclear states from the South Asian region abstained from voting on the resolution.... India was constrained to abstain from the voting as it is not convinced that the upcoming conference will be able to resolve the issue of coming up with a legally binding instrument for bringing about nuclear disarmament. This was conveyed by India's Permanent Representative to the CD. ...India is not hopeful that the negotiations would amount to much. In this context, it is difficult to assess if India would join the negotiations.

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However, participation cannot be completely ruled out because: India views nuclear disarmament favorably and views nuclear weapons use as the gravest threat to humanity. India has long struggled for nuclear disarmament for over five decades, and seized every opportunity at international fora to promote the objectives of nuclear disarmament. Its early articulations include rejection of nuclear weapons at the UNGA First Committee (1953), call for discontinuance of nuclear testing (1955), putting forward a draft resolution at the 12th UNGA appealing states to suspend nuclear tests/thermonuclear weapons (1957), and India's support to Anti-Nuclear Arms Convention (1962).

The Indian conception of disarmament that calls for equal participation from the NWS in a time bound framework has received little support from many nations. It has realized that its strategic interest have to operate in the setting of a world that refuses to work comprehensively towards nuclear disarmament. However, India's position on the issue has remained unchanged. After the Cold War too, India sought to create an ad-hoc committee on nuclear disarmament at the G-28 summit, before the 1996 CD. Its nuclear doctrine has linked 'global, verifiable, non-discriminatory' nuclear disarmament as a national security objective). In fact, in the year 2000, India tabled its traditional resolution in the UNGA on the "Convention on the Prohibition of the Use of Nuclear Weapons." In this context, the core agenda for the upcoming Conference is in line with the larger Indian position on nuclear disarmament. While no official pronouncement has been made by New Delhi as to whether it would like to participate, going by the historic narrative it can be argued that India would like to keep an open mind about its participation.

In recent times, especially in the years 2014 &2015, India got engaged with countries such as China and Japan in matters of disarmament and nonproliferation, and has participated actively in nuclear security/nonproliferation matters such as the Nuclear Security Summits' Gift Baskets, ratification of IAEA's Additional Protocol, CPPNM, GICNT, etc. It has also submitted a working paper on nuclear disarmament at the UNGA in 2006. It is in its national interest to be viewed as a responsible nuclear power, coupled with its bid for the membership of various multilateral export control regimes. While India understands the importance of the primacy of CD for the objective of nuclear disarmament, it would be in India's interest to at least observe the negotiations. In fact, two years ago, India's permanent representative to the CD reiterated the nations commitment towards nuclear disarmament and

stated that India will be tabling three draft resolutions relating to the 'prohibition of use of nuclear weapons', 'reducing nuclear dangers' and 'measures to prevent terrorists from acquiring the WMD's'. Participation in the Conference appears to be a logical step.

***Hurdles to Indian Participation*:** There are still issues that may constrain Indian participation. The fact that India considers the CD as the appropriate forum for any negotiations on disarmament, a separate forum might be viewed as a distraction. Additionally, the momentum towards the conference is yet to be seen. Since India is committed to universal and verifiable nuclear disarmament, the absence of major states from the conference might affect India's participation. The worry is that the conference might end up becoming a forum for deliberations primarily by civil society. In this context, it would only become another platform established by the NNWS to push the nuclear weapon states towards nuclear disarmament.

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Additionally, it must be taken into account that the conference is a follow up on the report of the Open-ended Working Group (OEWG)'s proposal in which India did not participate. Since 2013, India has expressed its reservation in participating at the OEWG as it considers only CD to be the right platform for deliberations on disarmament.

Conclusion: The upcoming conference is to be viewed as a notable event, as it is the first time in 71 years that UN members have called for a legally binding measure with such a sweeping majority. However, disinterest from nuclear weapon states has already called the initiative into question. While it is still unclear what the total number of participating states will be, some observations can be drawn from the voting result of the resolution. It must be noted that out of 177 participating member states, a majority of 123 nations have voted in favor of the conference, with 38 against and 16 abstentions.

Interestingly the absentees/ opponents include eight of nine nuclear weapons states while North Korea surprisingly voted in favor of the resolution. This suggests a conference to ban nuclear weapons has no support from the nuclear weapons states in the first place. It must be noted that all NATO members, with abstention from Netherlands, also voted against it. A significant holdout Japan also voted against the resolution on the grounds of it fragmenting the disarmament community. This implies that all the nuclear states that matter haven't shown much interest in the Conference. Clearly, the beginning doesn't appear to be very promising. In this context, there's an equal chance of India participating in the conference and giving it a miss. If at all India participates, it would be without legal commitments.

China appears to be engaged in rapidly developing a long-range bomber, to fortify its nuclear deterrent – a move that is acquiring sharper focus after the US President-elect Trump questioned Washington's unqualified support for Chinese sovereignty over Taiwan.

Source: https://southasianvoices.org, 19 December 2016.

OPINION – Atul Aneja

China Focuses on Nukes as Tensions with US Rise

China appears to be engaged in rapidly developing a long-range bomber, to fortify its nuclear deterrent – a move that is acquiring sharper focus after the US President-elect Trump questioned Washington's unqualified support for Chinese sovereignty over Taiwan. The state-run Xinhua

news agency is relaying comments attributed to China's Air Force Commander Ma Xiaotian that Beijing is developing the next-generation long-range bombers. The report said that the remarks by Gen. Ma confirmed the development of the "legendary H-20" bomber.

So Far, It hasn't Done It: The report quoted Rear Admiral Yin Zhuo, director of the PLA Navy's Expert Consultation Committee, as saying that China has so far not developed a large-tonnage, and long-range strategic bomber. The existing H-6 bomber that is in service is medium-sized, and not a strategic bomber. He added that China's new range of strategic bombers will be at par with B-2 bombers of the United States, and have difficult-to-spot stealth features.

Admiral Yin noted that China has three specific advantages in developing the H-20 bomber. First, the developers can derive stealth technology from the J-20 and J-31 fighters – two China built stealth fighters. Second, China has already manufactured large transport aircraft such as the Y-20 and C-919, which can yield know-how to build big-sized strategic bombers. Besides, the new generation bombers can be armed with cruise missiles, nuclear and other weapons, which are already available in the Chinese arsenal. As a result of these advantages in materials, design and weaponry, the time lines for developing the H-20 can be shortened, though a typical cycle for making strategic bombers is around 10 years.

An op-ed in *Global Times*, affiliated with the Communist Party of China (CPC), had advocated the rapid development of the land based DF-41 ICBM. The DF-41 missile, which is undergoing trials, can carry up to 10 nuclear warheads. With a range of around 12,000 km, it can target the entire US mainland, if launched from eastern China.

Trump may Change Status Quo? Following Mr. Trump's election and his perceived inclination to change the status quo with Beijing, an op-ed in *Global Times*, affiliated with the Communist Party of China (CPC), had advocated the rapid development of the land based DF-41 ICBM. The DF-41 missile, which is undergoing trials, can carry up to 10 nuclear warheads. With a range of around 12,000 km, it can target the entire US mainland, if launched from eastern China.

The Washington Free Beacon is quoting experts as saying that China is reconfiguring its entire range of land based atomic missiles, by enabling them to carry multiple warheads. That includes changes in the single warhead DF-5 as well as the DF-31 missiles. Besides, China is modernising its more survivable sea based deterrent-necessary for a retaliatory nuclear second strike — by adding multiple warheads to its JI-2 SLBM. The new missile will be either called JL-2C or JL-3.

Drone Seizure Deepens Rift: The seizure of a US underwater drone by China on 15th December, 2016 near Subic Bay in the South China Sea has added to the growing friction between Beijing and the Trump administration-in-waiting. Pentagon spokesman Peter Cook said the incident took place when the US oceanographic survey ship Bowditch was about to retrieve the drone, which was used to collect data on salinity and water temperature. But Chinese Defence Ministry spokesperson Yang Yujun defended China's action. "We had to examine and verify the device in a bid to avoid any harm it might cause to the safety of navigation and personnel," he said in a statement issued. He added that the drone would be returned "in an appropriate manner."

Trump's Tweet and Tit-for-tat: Mr. Trump has waded into the drone controversy with a tweet, which said that, "We should tell China that we don't want the drone they stole back – let them keep it!" His tweet triggered a cyberstorm in the Chinese social media. "Next time we will capture the US aircraft carrier without asking, since boss Trump is so generous," said a posting on Sina Weibo, Chinese equivalent of Twitter. "What are you so arrogant for? We will return it once it is disassembled," commented another on the micro-blogging site.

Source: http://www.thehindu.com/, 18 December 2016.

OPINION – Tim Yeo

Europe should Harmonise Safety Requirements for New Nuclear Build

The growing concern about climate change, as witnessed in Paris last year, has created the best opportunity for nuclear power in decades. New Nuclear Watch Europe (NNWE) has long argued that new nuclear build is critical to meeting Europe's decarbonisation targets. However, the interest group recognises that, if Europe is serious about its climate change commitments, the much needed shift from fossil fuels to low carbon generation sources, such as nuclear, is potentially threatened by the economics. Simply put, nuclear must be able to compete on economic grounds if it is to be fully accepted as part of the future energy mix. The technology's environmental, security of supply, safety and job creation credentials are undeniable and offer huge reward to any country's energy mix, but the technology needs to become cost competitive as well.

International cooperation lies at the heart of nuclear's future. It is right that nuclear is subject to extremely rigorous safety requirements, even though these are more stringent than those applied elsewhere in the energy industry. However, it is important that the higher costs that these requirements impose on nuclear are minimised by harmonising them wherever possible.

International cooperation lies at the heart of nuclear's future. It is right that nuclear is subject to extremely rigorous safety requirements, even though these are more stringent than those applied elsewhere in the energy industry. However, it is important that the higher costs that these requirements impose on nuclear are minimised by harmonising them wherever possible. The key argument anti-nuclear lobbyists put forward is that nuclear has an intrinsically negative learning curve, in other words, the cost per unit in a series increases. In fact, the opposite is true. The two main drivers behind the increasing cost of new nuclear build in the Western world over the last decade have been the lack of scale and standardisation needed for serial construction, which is in fact a consequence of the transition from Generation II to Generation III/III+ technology. Even as recently as the 1990s, we have witnessed a 10-13% reduction in cost (compared to first-of-a-kind) at the modest grid connection rate of one standardised reactor per year per vendor. It should be noted that an annual grid connection rate of two to three new reactors would deliver an estimated cost reduction in the region of 25-30% (versus a first-of-a-kind unit). More collaboration between regulators in different jurisdictions, and simplifying the process for designs that have a track record of safe commercial use in one market to be approved for use in another are both ways that can help to reduce the cost of nuclear.

In the latest of a planned series of Brussels-based, Nuclear Energy Policy Forum events, NNWE called on pro-nuclear countries across Europe (that is, the EU and beyond), to work together even more closely and harmonise safety requirements with the aim of reducing the cost of new nuclear to the benefit of consumers and governments alike. Safety requirements for nuclear new build vary considerably across the EU and its neighbouring countries. NNWE maintains that harmonisation of those requirements will drive costs down and allow the technology to compete on economic grounds. At the same time, NNWE is clear that in calling for the harmonisation of safety requirements it is not suggesting that any consequent reduction in the cost of nuclear new build should be at the expense of safety. Nuclear power stations have an outstanding record of safety in Europe and that should not be compromised.

The Brussels event brought together representatives from across the EU Institutions and the nuclear sector to consider whether the lack of harmonised safety requirements have made nuclear plants too expensive to build. Delegates heard from Dalibor Mateju, Former Board member of ÈEZ and former Head of UJV Branch Office in Ankara supporting Türkiye Atom

Enerjisi Kurumu (TAEK), who is of the view that the standardisation of safety requirements would be a significant step forward in delivering cost reductions. Mr Mateju fears that, if left unchecked, anti-nuclear lobbying groups will continue to push for excessively strict and effectively onerous safety requirements with "a goal of increasing the cost of construction of nuclear power plants so that the return on investment becomes impossible".

The political risk arising from anti-nuclear scaremongering coupled with the variance in safety requirements across European energy markets make it difficult for nuclear vendors to enter those markets and benefit from the economies of scale necessary to bring costs down. Something needs to happen to break down those barriers and create the kind of investment environment that vendors enjoy in their home markets. Picking up that theme, Mikhail Pigulevsky, Nuclear Safety and Technology Expert at the Belorussian Nuclear Power Plant, told delegates that the final price of electricity generated at the Belorussian plant, which is now under construction, is very competitive "thanks to the economies of scale the vendor can enjoy."

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Despite being based on the latest generation technology, which statistically (according to IAEA data) is among the most reliable in the world, the project is now facing mounting pressure by anti-nuclear groups in Brussels. Some even call for a ban or boycott of nuclear power imported the EU's neighbouring countries. NNWE finds those calls irresponsible. Fine particle air pollution associated with coal-fired power generation causes about 60,000 premature deaths each year across Europe. Creating trade barriers in low carbon and low pollution electricity in Europe, and blocking nuclear projects in the region makes it harder to cut that death toll.

NNWE is keen to ensure that safety requirements do not stifle new nuclear build, but encourage and promote it. Professor Laurence Williams of Imperial College, London, UK told delegates that there must be an understanding between licensees and regulators, with the safe use of nuclear energy dependent on that understanding and the competence of both parties. Professor Williams suggested that "the delivery of safe nuclear power and the application of strong nuclear regulation are not incompatible". The pressure is certainly on, since the beginning of the century Europe has seen only 11 new nuclear power units connected to the grid, of which two were in the EU. That means to meet its decarbonisation targets Europe needs a five-fold increase in the new build rate achieved this century. Applying the key principles of affordability, reliability and value creation for local supply chains, NNWE will continue to watch the nuclear sector to ensure that the right decisions, for all stakeholders, are made.

Source: http://www.euractiv.com, 15 December 2016.

OPINION – Manpreet Sethi

India's Nuclear Power Journey in 2016

The year 2016 closes without India having gained entry into the NSG. The expectations for this had reached a crescendo around the middle of the year when the Indian application was taken up at the plenary meeting in June in South Korea. However, China did not allow this to happen, burdening the Indian case for membership with several technical, procedural and political issues. Some other nations had a few issues too. A special envoy of the NSG was appointed to engage with these countries and address their concerns in the hope of scheduling a special meeting later in the year. However,

as it stands, India could not make it into the NSG in 2016.

This, however, has had little bearing on the strides that India's nuclear power programme and its growing engagement with several other nuclear supplier nations has made in the last 12 months. Several new achievements dotted the year and they augur well for the coming months.

The first major development of 2016, in fact, took place just at the turn of the year. Keen to address the concerns that had been voiced over the Civil Liability for Nuclear Damages Act (CLNDA) that had been enacted in 2010 but which had dampened the mood of domestic and international nuclear industry, the government notified the creation of a Nuclear Liability Fund with a corpus of Rs 2,000 crores in Jan 2016. This fund is meant to provide money in case damages resulting from a nuclear accident were to exceed the limit specified for nuclear power operators under the CLNDA, which is Rs 1,500 cr. In order to build the Liability Fund, the operators would pay a levy of 5-10 paise per unit of electricity sold and their payments into the Fund would continue till the accumulated amount touches Rs 2,000 cr. Thereafter, the payments would stop, only to recommence if any withdrawals are made from the Fund so that the balance stays at Rs 2,000 cr at any given point of time.

As it stands, India could not make it into the NSG in 2016 this, however, has had little bearing on the strides that India's nuclear power programme and its growing engagement with several other nuclear supplier nations has made in the last 12 months. Several new achievements dotted the year and they augur well for the coming months.

Moving further in this direction, India also ratified the IAEA Convention on Supplementary Compensation in February 2016. This would enable the availability of additional funds from an international pool in the unfortunate case of an accident. More aspects of the liability issue within the country were further addressed in August with the introduction of an Operators and Suppliers Policy through the India Nuclear Insurance Pool launched by General Insurance Corporation of India (GIC Re). With these tranche of measures, the concerns of the nuclear industry have pretty much been satisfied and the stage is set for their participation in the Indian nuclear power programme.

India's nuclear power programme, meanwhile, today boasts of 22 reactors contributing a little less than 6000 MW to the country's total electricity production. In Feb 2016, Koodankulam 1 (KK-1) achieved full power and the second unit was also synchronised in June this year, but it is yet to start commercial production of electricity. Construction work on units 3 and 4 has already started and eight more are planned at the same site through Russian collaboration – concluded in November 2016 when President Putin visited India. In anticipation of the booming business, Rosatom has set up office in Mumbai to facilitate greater participation of the local industry in future reactors. A higher local content would not only generate employment within the country but also reduce the cost of the reactors. Therefore, Indian nuclear cooperation with Russia is currently the most advanced and promising for the future.

Meanwhile, price negotiations for the French EPR nuclear plants to be built at Jaitapur, which had been ongoing through early 2016, hit a bump with the takeover of AREVA by Electricite de France (EDF) announced in June 2016. This has led to a turbulent phase within the French nuclear industry, in turn slowing down the cooperation with India too.

A third major development in international civilian nuclear cooperation came about with the conclusion of the bilateral agreement with Japan in Nov 2016. The agreement enables India to import nuclear material, technologies and reactors from Japan, a nation with advanced nuclear technology and which is a major player in the global nuclear supply chain. In fact, Japan Steel Works is amongst the only five companies worldwide that has the capacity to manufacture large-sized single-piece pressure vessels used in large capacity nuclear

reactors, the kind that India plans to import. American Westinghouse Electric, which is now owned by Toshiba uses components from JSW. In the absence of an Indo-Japan agreement, US nuclear industry with Japanese investment would have found it difficult to authorise transfers to India.

2016 also marked a record with regard to the import of uranium into the country. 3000 metric tonnes was imported from Russia, Canada and Kazakhstan. The availability of imported uranium for the safeguarded reactors has enabled a jump in their capacity factors. While the DAE too, through its UCIL has now seriously restarted uranium prospecting and exploitation within the country, the availability of uranium from outside will be a big help as the new indigenous nuclear reactors, seven of which are currently under construction, come on line from 2017 onwards.

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In the meantime, 2017 brings hope of fresh and significant developments. The first of these would be a straight jump of 1000 MW when KK- 2 begins commercial electricity production early in 2017. This would raise the nuclear component of the Indian electricity basket to about 3 per cent. In terms of numbers this does not seem to mean much. But the government remains hopeful that with the under-construction and proposed plants, it would be able to rapidly augment that number. Chairman, AEC and Secretary, DAE, has asserted that India has the ability to add capacity of nearly 2500-3000 MW annually "on a continual basis" in the coming years.

The second event to look out for in the New Year would be the start of operation of the first of the new line of 700 MW reactors. After the 540 MW reactors at Tarapur, these would be the biggest capacity reactors indigenously built in India. It would signify the maturation of its PHWR technology and these reactors are expected to become the standard reactors in the future.

A third much awaited development would be the attainment of criticality by the PFBR at Kalpakkam. This date has been pushed back for many years now and it is hoped that 2017 would be the lucky year when India begins to get a step closer to the second stage of its nuclear power programme. Given that nearly all countries that embarked on fast reactor technology have given it up (Japan being the latest to put its Monju reactor to rest in December this year), the eyes of the world would be on India to gauge the success of its PFBR. It is important that the country progresses steadily on this and takes care of all safety and regulatory issues before taking the final steps towards its criticality.

Apparently then, there is plenty on the anvil for the Indian nuclear power programme in the coming year. Meanwhile, in case the Indian nuclear diplomacy can also swing the NSG membership in 2017, it would be an additional reason to rejoice. But even if it does not, India's nuclear programme has plenty to keep it busy in 2017 and beyond.

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Source: http://stsfor.org/content/indias-nuclear-power-journey-2016#.WGSfFZw8AnR.twitter, 27 December 2016.

OPINION – Lamar Alexander and Sheldon Whitehouse

To Slow Global Warming, We Need Nuclear Power

...If 20 fire marshals came around and told us our houses were about to burn down, we'd buy some fire insurance. So when the leading science academies in 20 developed countries, along with several major American corporations and the national security community, all tell us that burning fossil fuels is causing dangerous changes to the climate, we think it's time for the US to get serious about clean energy.

It also means supporting safely operating nuclear power plants that produce carbon-free electricity. Already, 60 percent of our carbon-free electricity comes from the 99 nuclear reactors that dot the nation's map, from Avila Beach, Calif., to Seabrook, N.H. These reactors provide low-cost, reliable electricity for the US, which uses nearly 20 percent of the world's electricity. But over the next decade, at least eight of these reactors are scheduled to shut down. That will push up carbon emissions from the American electricity sector by nearly 3 percent, according to the US Energy Information Administration.

In roughly two decades, the US could lose about half its reactors. That's because, by 2038, 50 reactors will be at least 60 years old, and will face having to close, representing nearly half of the nuclear generating capacity in the US. Without them, or enough new reactors to replace them, it will be much harder to reduce carbon emissions that contribute to climate change. Unfortunately, some of our federal policies to encourage clean energy, do not explicitly include or incentivize nuclear power.

In California, the closing of the San Onofre Nuclear Generating Station in 2012 contributed to a 24 percent increase in carbon emissions from the electricity sector, according to data from the California Environmental Protection Agency Air Resources Board. Carbon emissions from the electricity sector in New England rose 5 percent in 2015, the first year-to-year increase since 2010, largely because of the closing of the Vermont Yankee Nuclear Power Station in December 2014, according to ISO New England, the region's grid operator.

In roughly two decades, the US could lose about half its reactors. That's because, by 2038, 50 reactors will be at least 60 years old, and will face having to close, representing nearly half of the nuclear generating capacity in the US. Without them, or enough new reactors to replace them, it will be much harder to reduce carbon emissions that contribute to climate change. Unfortunately, some of our federal policies to encourage clean energy, such as the Clean Energy Incentive Program within President Obama's Clean Power Plan, do not explicitly include or incentivize nuclear power. Likewise, some states have chosen to adopt policies, such as renewable portfolio standards, that do not include or incentivize nuclear power. ...At the same time, our energy markets do not currently account for the value of carbon-free power, a failure that puts nuclear power at an unfair and economically inefficient disadvantage to fossil fuels like coal and natural gas.

We come from different political parties, but we agree on the overall goal of levelling the playing field for nuclear power, and the need to find a bipartisan solution to achieve it. This matters because the investments we make today, in new plants and transmission infrastructure, will be around for decades. Every time new fossil energy replaces nuclear, we're locking ourselves in to a more carbon-heavy energy mix for years to come.

Some states and utilities are working to reduce carbon emissions with the understanding that nuclear power can be part of the solution. In the Southeast, there are four new reactors under construction that will provide 4,470 megawatts of carbon-free electricity – enough for 3.3 million homes. New York established a clean-energy standard in August that might help the state's reactors stay open, including one that had been announced as closing. Gov. Andrew M. Cuomo's

office explained that "maintaining zero-emission nuclear power is a critical element to achieving New York's ambitious climate goals." And the private sector is pitching in, too: According to Energy Secretary Ernest J. Moniz, there are dozens of entrepreneurs focusing on ways to improve and expand the nuclear power industry. The federal government should support these efforts.

We should also invest more in research to develop advanced nuclear reactors, including small modular reactors and accident-tolerant fuels. Advanced reactor designs may substantially reduce the threat of a meltdown. Many new, modular designs are much smaller than their predecessors, meaning they can be built in factories at lower cost and plugged into the grid as needed.

For one thing, we should extend existing reactor licenses from 60 to 80 years, in cases where the Nuclear Regulatory Commission says it is safe to do so. We should also invest more in research to develop advanced nuclear reactors, including small modular reactors and accident-tolerant fuels. Advanced reactor designs may substantially reduce the threat of a meltdown. Many new, modular designs are much smaller than their predecessors, meaning they can be built in factories at lower cost and plugged into the grid as needed. Some of these new reactor technologies could actually use waste from traditional reactors as fuel, helping to alleviate a major challenge facing the industry.

The Nuclear Regulatory Commission licensing framework, developed to support the last generation of reactors, should be updated to encourage and promote new investment in the next wave of advanced nuclear technology. And finally, we need to resolve the stalemate over where to store used nuclear reactor fuel. If we want to clean the air and reduce carbon emissions to deal with climate change, we need a stronger, not weaker, nuclear energy sector. Congress, federal agencies and the Nuclear Regulatory Commission must work with utilities to preserve our existing reactors in the safest possible way, and to develop the next generation of reactors that will provide cheaper, reliable, carbon-free electricity.

Source: Senator Lamar Alexander, Republican of Tennessee, is the chairman of the Senate Appropriations Subcommittee on Energy and Water Development. Senator Sheldon Whitehouse is a Democrat from Rhode Island, http://www.nytimes.com/, 21 December 2016.

NUCLEAR STRATEGY

CHINA

Seizure of US Drone Shines Spotlight on China's Nuclear Submarine Strategy

With its controversial seizure and return of a US underwater drone, Beijing may have inadvertently thrust into the spotlight one of the main motivations behind its ramped-up moves in the South China Sea: the quest to create a safe-haven for its sea-based nuclear deterrent. Submarines, in particular ballistic missile subs, have long figured prominently in China's desire to match the capabilities and prestige of other major nuclear powers. Slowly but surely…. Beijing has made progress on this front, building a formidable program that began very early in the ruling Communist Party's history.

Submarines, in particular ballistic missile subs, have long figured prominently in China's desire to match the capabilities and prestige of other major nuclear powers. Slowly but surely…. Beijing has made progress on this front, building a formidable program that began very early in the ruling Communist Party's history.

But securing the credibility of its overall nuclear deterrent has been a challenge. "In particular, experts worry that growing US missile defense, conventional precision strike, and space-based surveillance capability together allow for sophisticated preemptive attacks that pose a significant threat to China's land-based nuclear forces," Tong Zhao, a fellow at the Carnegie-

Tsinghua Center for Global Policy, wrote in a June report on China's sea-based nuclear deterrent. Prompted by these concerns, China has looked to its nuclear missile submarine program – and all that is associated with it – amid an intensifying rivalry with the US pulling out all stops in a bid to establish credible nuclear retaliation capabilities.

The Battleground for this Competition? Beneath the Waves in the South China Sea: In recent years, the strategic waterway has been lumped in with other Chinese "core interests," a set of critical issues on which there is very little room...for negotiation. Observers say Chinese strategists are interested in an open ocean patrol strategy, and many reportedly believe that to be the ultimate goal of China's nuclear missile fleet. First, however, it must secure the South China Sea as a sort of staging ground or bastion for extended operations. "Given the noise level of the existing Chinese SSBNs, the bastion strategy seems to offer a better near-term solution," Zhao wrote in his report, noting that known Chinese subs remain far noisier than their American counterparts. According to Zhao, the South China Sea appears to be the best bet for China's subs, given its depth and other environmental factors. Even though a large southern portion of the South China Sea is rather shallow – under 100 meters in depth – in much of the area roughly inside China's "nine-dash line" territorial claim, the continental shelf drops to a deep basin of around 4,000 meters, offering better cover for submarines.

Beijing faces huge obstacles if it seeks to dominate the South China Sea, part of what some analysts have termed a long-term project to create a virtual "Chinese lake."China has reclaimed 3,200 acres (1,280 hectares) of land on seven features it occupies in the disputed waters, giving it what the Pentagon says are long-term "civil-military" outposts from which it can project power.

Such a submarine bastion could be a first step toward giving Beijing the ability to break out into the Western Pacific and beyond, putting its subs – and their nuclear missiles – within range of the continental US. "Given the fact that the current Chinese submarine-launched ballistic missile – the JL-2 – does not have a range long enough to reach the continental United States from China's coastal waters, Chinese SSBNs have incentives to practice breaking through the 'first island chain' and into the West Pacific," Zhao told *The Japan Times* in an interview. The first island chain refers to a line stretching from Japan and Taiwan that China says has been used by the United States to contain it since the Cold War. But Beijing faces huge obstacles if it seeks to dominate the South China Sea, part of what some analysts have termed a long-term project to create a virtual "Chinese lake."

China has reclaimed 3,200 acres (1,280 hectares) of land on seven features it occupies in the disputed waters, giving it what the Pentagon says are long-term "civil-military" outposts from which it can project power. While Zhao disagrees that Beijing is seeking to turn the South China Sea into its own "lake," he said that China does- for the purpose of enhancing the survivability of its sea-based nuclear deterrent – have interests in strengthening its capability to detect and monitor enemy anti-submarine warfare platforms in the region. "Some of the China-controlled islands may be helpful for providing logistical support and protection for Chinese SSBNs patrolling in nearby waters. In other words, helping protect Chinese SSBNs may be part of Chinese motivations behind the land reclamation projects," Zhao said, adding that the projects were primarily driven by China's desire to reinforce its territorial claims in the South China Sea. Regardless, perhaps the biggest obstacle for Beijing is trade and location: The strategic waterway is home to some of the busiest

The strategic waterway is home to some of the busiest international commercial shipping lanes in the world and is surrounded by other nations, including fellow claimants to the waters, making encounters with numerous navies inevitable.For China, though, the US Navy's presence in the waterway – and its surveillance activities there – have been perhaps the most implacable threat to control of the waters, de facto or otherwise.

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For China, though, the US Navy's presence in the waterway – and its surveillance activities there – have been perhaps the most implacable threat to control of the waters, de facto or otherwise. These concerns were highlighted on 15 December, when the Chinese Navy seized a US unmanned underwater vehicle (UUV) in international waters in the South China Sea, prompting a formal diplomatic protest and a demand for its return. The UUV was returned on the 20 December. "The US cannot hide its real agenda by downplaying recent events," the state-run People's Daily newspaper said in an editorial written by Hua Yiwen, who it described as an international affairs expert. "The unmanned drone was just the tip of the iceberg when it comes to US military actions against China. The US has been developing UUVs for a long time, treating them as a 'power enhancer' for its military and a crucial part of its weapons system."

While 15th December's seizure was rare in that it was made public, both China and the US have been busy bolstering their surveillance operations in the area in recent years, including the use of UUVs. "This is not the first time that we seized a US underwater drone in the South China Sea, but the one we seized on 15 December is new and more advanced than before and might carry valuable information just gathered in the South China Sea," the Global Times... quoted Li Jie, a Beijing-based naval expert.... "This is why the US was so nervous and tried to use the media to hype it up this time while it had remained silent before," the paper quoted Li as saying. "The US was aware that such spying activity is inappropriate."

The US "has shown considerable interest in using new technologies like unmanned underwater drones to track and trail Chinese SSBNs," the Carnegie-Tsinghua Center's Zhao said in his report, noting US government-sponsored studies about how to deploy such drones near Chinese submarine bases to detect the vessels as they leave and return to port. In April, US Defense Secretary Ash Carter announced that Washington would invest more than $8 billion just next year in undersea capabilities "to ensure ours is the most lethal and most advanced undersea and anti-submarine force in the world." "That includes new undersea drones – in multiple sizes and diverse payloads – that can, importantly, operate in shallow waters where manned submarines can't," Carter said.

China, for its part, has reportedly hustled to match the US technological prowess under the waves. In an example of this, top Chinese researchers gathered 17 December just two days after the US drone's seizure – for what was billed as the nation's first underwater drone symposium. This came after Chinese researchers carried out the first test of an underwater glider drone that could challenge the record for the deepest dive, a mark held by a vessel now in use by the US Navy, the South China Morning Post reported in September.

The tests of the Haiyi-7000 underwater glider drone have reportedly piqued the interest of the Chinese military, the paper said. The Pentagon has said the seized drone, reportedly a Teledyne-Webb Slocum G2 glider with significant military applications, used commercially available technology that sold for about $150,000. Experts, however, have painted a more nuanced picture. According to Malcolm Davis, a senior analyst at the Australian Strategic Policy Institute in Canberra, the type of drone that was taken, which resembles an aircraft that flies underwater, is used for oceanographic research to map the underwater terrain and conditions such as temperature, acoustic activity and salinity. "That's very useful for the US to sort of map the underwater battle space that China would be deploying submarines into," Davis said. But while understanding how the glider concept works is accessible, he added, "it is complex in its execution." "In terms of the concept, if you put wings on a drone, you can use the current to glide," he said. "But exactly how you do that and the technology within that drone, in terms of sensors and guidance, is complex and quite classified."

While it remains unknown precisely how crucial a part underwater drones currently play in the waters of the South China Sea,

the rapid pace of technological breakthroughs means continued deployments are unlikely to abate anytime soon. "Drones already are and will continue to play a more important role in underwater 'cat-and-mouse' games. ...This trend will only increase as autonomous technologies improve. US military doctrines have openly called for prioritizing the deployment of unmanned underwater vessels in the Asia-Pacific region, presumably to counter the perceived threat from China." And while the drone seized was likely only used for collecting hydrological data that is useful for anti-submarine operations, "US intentions to use underwater drones in the future to actively track and trail Chinese submarines are no secret," Zhao added. "Under these conditions, China will for sure develop similar technologies of its own," Zhao said. "It is high time for the international community to sit down and discuss possible rules of the road for employing unmanned maritime military systems for the sake of avoiding future incidents.

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Source: http://www.japantimes.co.jp/, 20 December 2016.

INDIA

Indian Army will Soon have NBC Protection Suits to Counter Pakistan's TNWs

Keeping an eye on Pakistan's nuclear tipped non-strategic battle-field missile, India will soon acquire 1500 advanced Nuclear Biological and Chemical (NBC) protection suits for its Armoured Personnel Carriers (APC). An APC – carrying about 10 fully armed soldiers is an offensive platform. It is used to carry troops in and to the battlefront. India has over 36 Mechanized Infantry Regiments and has nearly 1800 APC. The acquisition will cost the exchequer Rs 1265 crore. This decision to acquire the NBC protection suits was taken at Defence Acquisition Council (DAC) meeting that is chaired by the Defence Minister Manohar Parrikar.

India will soon acquire 1500 advanced Nuclear Biological and Chemical (NBC) protection suits for its Armoured Personnel Carriers (APC). An APC – carrying about 10 fully armed soldiers is an offensive platform. It is used to carry troops in and to the battlefront. India has over 36 Mechanized Infantry Regiments and has nearly 1800 APC. The acquisition will cost the exchequer Rs 1265 crore.

... The NBC protection suits will be built by Bharat Electronics Limited and will be designed by the DRDO, sources said. "APC we use now have a manually operated NBC suits, there is need for better and full automated advanced NBC suits," a senior Army officer aware of the decision told Huffington Post. The advanced NBC protection suits will have censors that will detect in coming threats and take action on its own to protect the solider, the officer added.

Source: Report by Sudhi Ranjan Sen, http://www.huffingtonpost.in/2016/12/23/indian-army-will-soon-have-nbc-protection-suits-to-counter-pakis/, 23 December 2016.

With Agni V Success, India Adds Long-Range ICBM to Arsenal

Additions to a country's arsenal are rarely predicated on any foreseeable usage – these are made more with deterrence in mind, especially when you have hostile to cold neighbours. Though India is better placed than Pakistan in terms of

military prowess, it lags behind its other neighbour, China. Despite having the fourth-highest defence spending globally, New Delhi's defence budget is a third of Beijing's. But, it is now all set to flex some newly honed muscles, adding to its armoury a long-range ICBM. This puts India in a select global club. With the fourth successful test-fire of Agni V – the ICBM was first tested in 2012 – India becomes the sixth country after the US, the UK, Russia, China, and France to have developed a 5,000-km-plus range, nuclear-capable missile. While Agni V still doesn't put it on a par with China – which has a missile whose range is over-11,000-km – the ICBM sure adds to its military capability.

The Babur cruise missile is equipped with state of the art navigational technologies of Terrain Contour Matching (TERCOM) and Digital Scene Matching and Area Co-relation (DSMAC), which enables it to hit targets with pinpoint accuracy even in the absence of GPS navigation. "Babur Weapon System is an important force multiplier for Pakistan's strategic defence.

... Agni V would still have to undergo trials under the Strategic Forces Command before it is inducted for operations. It is also expected to have a more intelligent entry mechanism to defeat enemy ballistic missile defence systems. But the highlight would be the manoeuvrability these will provide, given that the 50-tonne payload can be fired from any of the launch trucks.

The Russian Strategic Missile Force concentrates over 60% of strategic weapons and warheads of Russia's strategic nuclear forces. In addition to the Strategic Missile Force, Russia's nuclear triad includes seaborne strategic forces and strategic aviation, the commander said. According to the commander, "99% of launchers in the Strategic Missile Force grouping are kept in a combat-ready state.

Source: http://www. financialexpress. com, 15 December 2016.

PAKISTAN

Pakistan Conducts Successful test of Babur Cruise Missile

Pakistan on 14 December 2016 conducted a successful test of an enhanced version of the indigenously developed Babur cruise missile.... The cruise missile incorporates advanced aerodynamics and avionics and can strike targets on both land and sea at a range of 700 kilometres, added the ISPR statement. "It is a low flying, terrain hugging missile, which carries certain stealth features and is capable of carrying various types of warheads," the military's media wing said.

The Babur cruise missile is equipped with state of the art navigational technologies of Terrain Contour Matching (TERCOM) and Digital Scene Matching and Area Co-relation (DSMAC), which enables it to hit targets with pinpoint accuracy even in the absence of GPS navigation. "Babur Weapon System is an important force multiplier for Pakistan's strategic defence."

The launch was witnessed by Chairman Joint Chiefs of Staff Committee General Zubair Mahmood Hayat, senior officers from the SPD, Strategic Forces, scientists and engineers of strategic organisations. "This test further strengthens Pakistan's deterrence capability," said General Hayat. Earlier this year, Pakistan conducted a successful flight test of the indigenously developed Air Launched Cruise Missile (ALCM) Ra'ad.

Source: http://www. dawn.com/, 15 December 2016.

RUSSIA

Russian Strategic Missile Force Armed with about 400 Ballistic Missiles

Russia's Strategic Missile Force operates about 400 intercontinental ballistic missiles, which makes up over 60% of the Russian nuclear triad's warheads and carriers, Strategic Missile Force Commander Colonel-General Sergei Karakayev said. "At present, the Strategic Missile Force

grouping comprises about 400 ICBMs with nuclear warheads of various categories of their capacity," the commander said.

Therefore, the Russian Strategic Missile Force concentrates over 60% of strategic weapons and warheads of Russia's strategic nuclear forces. In addition to the Strategic Missile Force, Russia's nuclear triad includes seaborne strategic forces and strategic aviation, the commander said. According to the commander, "99% of launchers in the Strategic Missile Force grouping are kept in a combat-ready state."

As the commander said, the funds allocated under the state armament program through 2020 allow maintaining the pace of troops' rearmament. "The emphasis in developing the Strategic Missile Force's perspective strike grouping will be made on its qualitative transformation and a considerable increase in the share of modern missile systems," the commander said.

The missile of the Yars system incorporates the options of an antimissile trajectory maneuver to dodge space-based missile shield interceptors. Of course, this system, as it enters into service, considering the development of missile shield complexes and the system's upgraded versions, will in a perspective strengthen the combat capabilities of the Strategic Missile Force strike grouping to breach missile defense systems and strengthen the nuclear containment potential of the Russian strategic nuclear forces.

Over the same period, the systems of troops' and weapons' combat control will be qualitatively improved, he added. "In the final account, the Strategic Missile Force will have a balanced structure and operate an optimal number of missiles designated to solve the diverse tasks of ensuring nuclear containment and Russia's security," the commander said.

Russia's strategic missile system Sarmat will go operational in 2019-2020.

"Alongside the gradual withdrawal of the Voyevoda missile from service the strategic missile system Sarmat will be authorized for service and go operational. The Sarmat is a silo-based liquid propellant heavy missile. The estimated date when it may enter duty is 2019-2020," Karakayev said, when asked when the Sarmat might take Voyevoda's place. Karakayev said the Voyevoda's reliability parameters after 28 years in service remained stable. "The decisions made by now will keep the Voyevoda complex till 2022," he added. ...The Sarmat's prototype was already available in the autumn of 2015, but no pop-up tests have been made so far. A source in the defense-industrial complex at the Plesetsk space site was not ready yet, adding that the first tests were due at the end of 2016.

Yars Missiles: Russia's Yars intercontinental ballistic missiles are capable of dodging space-based antimissile interceptors, Karakayev said. "The missile of the Yars system incorporates the options of an antimissile trajectory maneuver to dodge space-based missile shield interceptors. Of course, this system, as it enters into service, considering the development of missile shield complexes and the system's upgraded versions, will in a perspective strengthen the combat capabilities of the Strategic Missile Force strike grouping to breach missile defense systems and strengthen the nuclear containment potential of the Russian strategic nuclear forces," the commander said.

The Yars missile system has larger capabilities for the use of the positioning area compared to the Topol ICBMs, which it is designated to replace, the commander said. "The Yars design specifics allow for launches from the sites, on which the Topol could assume combat duty only after special engineering re-equipment. Improvements have been made to the characteristics of communications means and the chassis and the missile itself has become more powerful and actually invulnerable to the enemy's existing missile shield systems. The Yars missile warhead has also changed qualitatively, the commander said.

Russia missile forces to conduct 10 ballistic launches in 2017. ... Karakayev recalled that in 2016 the Strategic Missile Force carried out six missile launches - four of new missile systems, one for the purpose of prolonging the operation of existing missiles and one combat training launch.

The SMF commander said that Russia would notify the United States of all of its missile launches no less than 24 hours in advance under the Soviet-US treaty of 1988 and within the framework of the current strategic arms reduction treaty. "The notification states the planned launch dates, the site and the area where the warheads are expected to fall," he said. Karakayev told the media that 160 weapon samples have been tested at the Kapustin Yar test site this year, twice the number tested last year. "In 2017 the experimental facilities will finish to be upgraded. This will allow for increasing the intensity of launches and expand the range of tests," he said.

Source: http://tass.com/defense/919518, 15 December 2016.

Atomic energy minister Jitendra Singh confirmed on 15 December, 2016. ... Singh said the government had revised its "in principle" approval of the site from six units of 1000 MWe capacity each to six units of 1208 MWe capacity. He said "fresh" environmental impact assessment studies were being carried out accordingly, with a public hearing forming part of the process of obtaining environmental clearance.

BALLISTC MISSILE DEFENCE

USA

US Military Test-Fires SM-6 Weapons in Missile Defense Test

The US Missile Defense Agency and US Navy have launched their latest missile defense test in the Pacific Ocean in a successful demonstration that hurled two interceptors at an incoming medium-range ballistic missile. The test occurred Dec 14 and launched two Raytheon-built Standard Missile-6 Dual 1 (SM-6) missiles from the Navy destroyer USS John Paul Jones from just off the coast of Hawaii, MDA officials said in a statement. The two SM-6 projectiles were launched against a medium-range ballistic missile target as part of the MDA's Sea-Based Terminal Program, using Navy ships equipped with the Aegis Ballistic Missile Defense System.

... "The SM-6 missile uses an explosive warhead to defeat ballistic missile threats, differing from other missile defense interceptors, such as the Standard Missile-3, which use non-explosive hit-to-kill technology," MDA officials wrote in the statement. The SM-6 Dual 1 missile system reached operational status in 2016. More than 315 missiles have been delivered to the US Navy, and more are in production, Raytheon representatives wrote in a Dec 19 statement describing the recent test.

The missiles are designed to defend Navy vessels against threats from fixed- and rotary-wing aircraft, unmanned drones and cruise missiles, as well as ballistic missiles in the terminal phase of their flight, Raytheon representatives wrote. The missile also can be issued as an offensive weapon, they added.

Source: Tariq Malik, http://www.space.com, 22 December 2016.

NUCLEAR ENERGY

INDIA

India Approves Kovvada Capacity Increase

The Indian government has approved an increase in capacity of the proposed Kovvada nuclear power plant and is conducting a new environmental impact assessment for the project, atomic energy minister Jitendra Singh confirmed on 15 December, 2016. ... Singh said the government had revised its "in principle" approval of the site from six units of 1000 MWe capacity each to six units of 1208 MWe capacity. He said "fresh" environmental impact assessment studies were being carried out accordingly, with a public hearing forming part of the process of obtaining environmental clearance.

Kovvada, in Andhra Pradesh, had previously been earmarked for construction of GE-Hitachi ESBWR reactors, but India's Department of Atomic Energy said in June it would not support building any reactor design that did not have a reference plant. No ESBWR has yet been built, but AP1000s are under construction in China and the USA, with the first units - China's Sanmen 1 and Haiyang 1 nearing commissioning. The NPCIL then allocated the Kovvada site for construction of six Westinghouse AP1000 reactors. The Indian and US governments have called for continued engagement between Westinghouse and NPCIL towards finalising the contractual arrangements for the six Kovvada units by June 2017.

Source: http://www.world-nuclear-news.org, 16 December 2016.

New Draft Proposal could Pave Way for India's NSG Membership

A new draft proposal circulated among NSG member states early this month could pave the way for India to become a member of the elite club, but this is unlikely to happen before the end of the Obama presidency next month. The American push for India to become a full-fledged member of the NSG would now have to be pursued by the incoming Trump Administration as the outgoing Obama Administration is unlikely to fulfill its promise made to the Modi Government before its term expires January 20, informed sources said.

A draft formula for NSG membership to countries like India and Pakistan that are not a signatory to the NPT was submitted by Rafael Mariano Grossi, the former NSG Chair, who prepared the report on behalf of South Korea, the current NSG chair. ... Informed sources in the US government told PTI that the current "time-line" does not ensure India's membership under the Obama Administration, for which it had tried hard, but for the Chinese "resistance" in this regard.

Source: The Times of India, 28 December 2016.

JAPAN

Monju Prototype Reactor, Once a Key Cog in Japan's Nuclear Energy Policy, to be Scrapped

Once envisioned as playing a key role in Japan's nuclear fuel-recycling policy, the controversial Monju prototype fast-breeder atomic reactor will now be scrapped, the government formally announced on 21st December, 2016. The reactor, in Tsuruga, Fukui Prefecture, has been a magnet for controversy, barely operating over the past two decades despite its planned key role. ...Ministerial decision came in spite of a failure to obtain local support for the decommissioning plan. It was also the end of a process that included a discussion of Japan's overall fast-reactor policy by the government panel.

With Monju's decommissioning, and the accompanying loss of jobs and subsidies, the central government also risks damaging its rapport with Fukui Prefecture, which hosts a number of other currently shuttered atomic power plants along the Sea of Japan coast. The government has calculated it will cost at least ¥375 billion over 30 years to fully decommission the facility.

The government has invested more than ¥1 trillion ($8.5 billion) in research and development for the reactor – which was designed to produce more plutonium than it consumes while generating electricity – in hopes it would serve as a linchpin of nuclear fuel-recycling efforts. Because resource-poor Japan relies on uranium imports to power its conventional reactors, the government will still continue to develop fast reactors in pursuit of a nuclear fuel cycle that reprocesses spent fuel and reuses plutonium and uranium extracted through reprocessing. But Monju's fate is sure to prompt more public scrutiny of the fuel-cycle policy, with many nuclear reactors left idled after the 2011 Fukushima nuclear disaster. That crisis has left much of the public wary of nuclear power.

With Monju's decommissioning, and the accompanying loss of jobs and subsidies, the central government also risks damaging its rapport with Fukui Prefecture, which hosts a number of other currently shuttered atomic power plants along the Sea of Japan coast. The government has calculated it will cost at least ¥375 billion over 30 years to fully decommission the facility. It plans to remove the spent nuclear fuel from the reactor

by 2022 and finish dismantling by 2047.

Monju achieved sustained nuclear reactions, which technically constitutes criticality, in 1994. But a series of problems, including a leak of sodium coolant the following year, has left it largely mothballed for the subsequent two decades. Restarting operations at the plant would have cost at least ¥540 billion, according to government forecasts....

Source: http://www.japantimes.co.jp/news/, 21 December 2016.

PAKISTAN

Pakistan's Fourth NPP, Built with China's Assistance, Goes Online

Pakistan Prime Minister Nawaz Sharif inaugurated power production from 340mw Chashma-III nuclear power plant 'C-III' near Mianwali. Speaking at the inauguration ceremony, the prime minister slammed the opposition, calling on them to refrain from 'sabotaging' Pakistan's national interests. "We shouldn't waste our time launching unnecessary protests," he said. "Ending loadshedding is one of our top priorities," he said, reiterating his government's commitment to end loadshedding by 2018.

The power project is a joint collaboration between the PAEC and China National Nuclear Corporation. It was executed by the PAEC under the guidelines of the International Atomic Energy Agency. PM Nawaz said the Chashma-III nuclear power plant will add 600MW to the national grid, adding that it will also help PAEC in achieving the overall target of 8,000MW. He also directed the PAEC to accelerate the production of nuclear power plants.

The premier congratulated the participants and the PAEC on timely completion of the project and thanked the China Atomic Energy Authority and the Export-Import Bank of China for extending technical and financial support to the endeavour. The Chashma-III nuclear power plant was preceded by the Chashma-I and Chashma-II power projects. Another unit of the same capacity, Chashma-IV, is expected to be completed in the coming year. The premier expressed hope that the Chashma-IV would be completed before its deadline.

Additionally, the Karachi nuclear power projects K-II and K-III are expected to add a total of 8,800MW electricity to the national grid by 2030 as a mid-term target for the PAEC. The prime minister said that timely completion of the K-II and K-III nuclear power plants will strengthen bilateral relations with China. He invited Chinese investors to invest in various sectors in projects that are mutually beneficial.

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Source: http://www.dawn.com/news/1304960/pm-nawaz-inaugurates-340mw-chashma-iii-nuclear-power-plant, 29 December 2016.

NUCLEAR COOPERATION

CHINA–UK

Chinese State Councillor Yang Jiechi held a meeting with UK Prime Minister Theresa May on 20 December 2016. The sides discussed developing the strategic partnership between the two countries, improving bilateral trade and investment as well as addressing various security challenges, according to Downing Street.... China also plans to step up coordination on various global and regional issues, he added. Chinese Press Calls for Nuclear Build-Up to Face Trump's US "They also touched on foreign policy issues, including Afghanistan, where they agreed the UK and China should pursue enhanced cooperation in support of Afghan reconstruction," Downing Street said on the 20th.

In late September, the UK government signed a final agreement with the French electricity company EDF for construction of Hinkley Point C nuclear power station. EDF plans to co-finance it together with China General Nuclear Power Group (CGN). The nuclear power plant is expected to meet 7 percent of the UK's energy needs once

it opens in 2025. In July, the prime minister delayed the signing of the project due to concern over Chinese participation.

Source: https://sputniknews.com, 21 December 2016.

INDIA–RUSSIA

Nuclear Projects in Third Countries: Indian Cog in Russia's Nuclear Apparatus

Russian state-owned nuclear utility Rosatom has indicated that it would cooperate with India in building Russian-designed nuclear power stations in third countries. The Russians have established a regional centre in Mumbai, which is aimed at reinforcing partnerships with Indian suppliers and coordinating the company's proposed projects in Bangladesh and Sri Lanka. The Mumbai centre will specifically work on "identifying new opportunities for the development of Rosatom's nuclear power and non-energy businesses in the South Asian region".

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This comes at a time when Russia has been working hard on increasing its competitive edge in the nuclear plant construction market through serial production of new reactors across markets, including in India. The cooperation, officials involved in the exercise said, is to be extended to the area of joint extraction of natural uranium and the production of nuclear fuel and atomic waste elimination. The Russian proposal to jointly build nuclear power plants is significant, considering that Rosatom has 29 nuclear reactors in various stages of planning and construction in more than a dozen countries (the largest internationally). These include in Jordan, Hungary, Egypt, Iran, Finland, Turkey and Argentina. ... In addition, the employees of the centre also supervise our projects in India, Bangladesh and Sri Lanka". Rosatom has already opened similar centres in Central and Southern Africa, Eastern, Central and Western Europe, Central and Southeast Asia as well as North and Latin America. In 2016, such centres have been opened in Dubai and Beijing, apart from the new one in Mumbai.

With India, Russia has already made an offer to provide a new range of reactor units – the VVER-Toi design – for the third and fourth units of the Kudankulam project in Tamil Nadu. The Russians have also indicated that Rosatom is open to shortlisting a handful of Indian equipment vendors in a bid to move towards a serial construction model in India, starting with the localisation of mechanical engineering production to produce components and equipment here to avoid time and cost overruns, as experienced with the first two units of the Kudankulam project.

A DAE official said the development is build on the Strategic Vision document signed by the governments of India and the Russian Federation in December 2014 for strengthening cooperation in atomic energy. The document mentioned that the two countries would explore "opportunities for sourcing materials, equipment and services from Indian industry for the construction of the Russian designed nuclear power plants in third countries". The vision document also suggested that the two countries "would examine the possibility of technical cooperation in mining activities within their territories and collaborate in exploration and mining activities in third countries". Rosatom has an ambitious target of increasing the foreign order portfolio to $150 billion in the next five years. In Bangladesh, Rosatom will start work on the Ruppur Nuclear Power Plant (NPP) by early 2017. The procedure to receive a permit for the site, which is one of the necessary conditions for the entry into force of the general contract, has taken place.

In 2013, Rosatom signed an agreement with Sri Lanka's Nuclear Energy Agency for cooperation

in nuclear energy that provides for assistance to Sri Lanka in the development of nuclear energy infrastructure, the creation of a nuclear research centre, uranium exploration and the training of workers. With India, Russia has already made an offer to provide a new range of reactor units – the VVER-Toi (typical optimised, enhanced information) design – for the third and fourth units of the Kudankulam project in Tamil Nadu. The Russians have also indicated that Rosatom is open to shortlisting a handful of Indian equipment vendors in a bid to move towards a serial construction model in India, starting with the localisation of mechanical engineering production to produce components and equipment here to avoid time and cost overruns, as experienced with the first two units of the Kudankulam project.

Negotiations for the design contract for units 3 and 4 are already underway and these new reactors, expected to be supplied with far greater local inputs than was used for the initial set of two VVER-1000 reactor units at Kudankulam, are likely to require just a four-year construction period between first pour of concrete and commissioning. Russia and India had agreed in 2015 to actively work on projects deploying 12 additional nuclear reactors, for which the localisation of manufacturing in India under the NDA government's flagship 'Make in India' initiative and the commencement of serial construction of nuclear power plants was flagged as a joint initiative.

In this context, the Programme of Action for localisation between Rosatom and India's DAE was finalised during PM Modi's Moscow visit in 2015. At the Kudankulam site, where the two Russian-designed VVER-1000 series reactors are being installed, nearly 100 Russian companies and organisations are involved in documentation, supply of equipment and controlling construction and equipping process. This has been cited as one of the reasons for the delays and localisation is being considered for quicker project execution at cheaper costs.

Russia has been working hard on increasing its competitive edge in the nuclear plant construction market through the serial production of new reactors across markets.

In 2012, an integrated Russian nuclear company was formed to consolidate its nuclear power engineering expertise into a single division, something that has enabled Rosatom to move towards a serial production option in the different countries that it is supplying projects to. The umbrella firm – NIAEP-JSC ASE – comprises over 20 entities, with the major players being Atomstroyexport, which specialises in the construction of overseas nuclear power plants; NIAEP, which builds units in Russia; and design company Atomenergoproekt. NIAEP-JSC ASE had a portfolio in 2014 worth about $60 billion.

Pimenov, in his response, said: "Rosatom State Atomic Energy Corporation is the undisputed leader in the global nuclear market and the only vendor in the world that is capable of providing a full range of services in the nuclear industry, from uranium mining and fuel production to designing nuclear infrastructure and gaining public acceptance of nuclear power. At the present time Rosatom is actively expanding its global footprint, regional offices are being opened. Their goals include the promotion of products and services, the development of new areas of work and, of course, the coordination of ongoing projects."

Source: http://indianexpress.com/, 21 December 2016.

NUCLEAR PROLIFERATION

IRAN

Experts Fear Iran could Increase Nuclear Proliferation

Iranian President Hassan Rouhani has ordered the country's Atomic Energy Organisation to start planning the development of nuclear-powered vessels which would require Tehran to increase the enrichment of uranium. The US administrations responded to the announcement to quell anxieties that further increase in the enrichment of uranium breached the nuclear deal. A senior US administration official told Arab News that "such an announcement does not run counter to the JCPOA," and that the deal "allows more oversight and monitoring of Iran's programme." However, according to the Saudi-based newspaper, experts

see in Rouhani's move a worrisome development that could jeopardise the agreement itself, or be used to gain leverage in its implementation.

Examining if the announcement was indeed a violation or an attempt to create new political leverage it quoted Ken Sofer, a senior policy adviser at the Centre for American Progress, who told Arab News that Rouhani's move could be a play for leverage in the implementation of the nuclear deal. "It's possible Rouhani and Trump are simply signalling to one another in an attempt to gain greater leverage through the implementation process of the nuclear agreement," Sofer said. According to experts quoted by the Saudi news agency, the announcement itself is alarming. ...

Source: https://www.middleeastmonitor.com, 14 December 2016.

NORTH KOREA

What Role can Russia Play in North Korean Denuclearization?

On December 6-7, the International Luxembourg Forum on Preventing Nuclear Catastrophe's supervisory council held a meeting in London, moderated by Vladimir Dvorkin and Viacheslav Kantor. Dvorkin, a retired major general in the Russian armed forces, declared that North Korea's tactical nuclear weapons had reached a state of full effectiveness. He specifically stated that North Korea was currently capable of outfitting tactical rockets with nuclear warheads, citing available data. The revelation of the former Russian soldier-turned-scholar coincides with an assertion from the highest levels of the Russian government that Moscow intends to cooperate with Washington on global nuclear security. Yet the prospects of closer Russia-US cooperation over North Korea remain elusive, if for no other reason than the lack of importance the US attaches to the Russian presence in negotiations.

Moscow intends to cooperate with Washington on global nuclear security. Yet the prospects of closer Russia-US cooperation over North Korea remain elusive, if for no other reason than the lack of importance the US attaches to the Russian presence in negotiations.

***Change of Tune*:** Russian President Putin recently promulgated a new foreign policy concept in which Russia affirmed its commitment to cooperation with the US towards nuclear disarmament and non-proliferation. Viacheslav Kantor, a renowned Russian philanthropist, praised the new foreign policy concept as a beacon of hope for Russia-US cooperation on nuclear security. To be sure, Kantor was not necessarily referring specifically to joint Moscow-Washington cooperation over North Korea. The main focus, rather, is Russia-US bilateral cooperation, as the new foreign policy concept specifically referred to the bilateral arms reduction treaty signed by Russia and the US in 2010. But Russia's adoption of a new foreign policy concept that specifically highlights the importance of Russia-US cooperation on nuclear security is unlikely to have a significant effect on the potential for greater Russia-US cooperation over North Korea.

***Moscow Intends to Cooperate with Washington on Global Nuclear Security*:** Even if, in the highly unlikely event that Russia-US relations experience a major positive turnaround in the coming years, the very reality of Russia's lack of influence over North Korea, as perceived by Washington, especially when compared with that of China, will continue to diminish prospects for Moscow-Washington cooperation. Recent events at the diplomatic level preceding the Luxembourg Forum's meeting underscore the fact that the prospect of an increased Russian role in multilateral responses to North Korea is beyond the scope of merely passing resolutions, or even willing a more profound Russian role as a matter of diplomatic course.

***Moscow Delays Sanctions*:** On November 23, a senior UN Security Council diplomat stated that China and the US had reached an agreement on a new package of sanctions against North Korea in response to the DPRK's nuclear test in September. Russia, however, had as of that time not yet

agreed to the sanctions. The diplomat, speaking anonymously, claimed that it was possible for China to convince Russia to go along with the sanctions. The implication that Russia was somehow responsible for intentionally delaying the newest resolution on sanctions drew criticism from the Russian media.

The US had a tendency to work primarily with China over North Korean security issues, given China's vast trade with North Korea. In contrast, the US routinely "ignored" Russian interests.

Russia's state-owned Rossiyskaya Gazeta published a summary of an interview with an anonymous source who was "well aware" of the problem. In the interview, the unnamed source stated that the US had a tendency to work primarily with China over North Korean security issues, given China's vast trade with North Korea. In contrast, the US routinely "ignored" Russian interests. The source also went on to state that the reason for Russia's delay in approving the sanctions was because of the need for interagency cooperation and agreement within the Russian government to fully agree to the terms of the sanctions. This, of course, was not the first time that the UN Security Council has delayed a vote on North Korea sanctions at Russia's behest. The implication that Russia was somehow responsible for intentionally delaying the newest resolution on sanctions drew criticism from the Russian media

At the governmental level, Russia-US cooperation is unlikely to substantially shift toward closer cooperation, much less in a direction that Russia favors. Yet as the recent International Luxembourg Forum meeting in London highlights, there is still ample room for exchange between Russia and Western figures outside of government.

Setting Aside Differences: The fact that China and the US have managed to compartmentalize North Korea as an issue separate from other areas of China-US discord, such as heightened tensions over the South China Sea, underscores the fact that multilateral cooperation over nuclear security on the Korean Peninsula is not contingent upon the state of overall bilateral relations between powers. Both have been able to cooperate over North Korea, by and large because the US views China as a valuable and more-or-less indispensable partner in multilateral discussions and diplomacy regarding the DPRK. Thus, it is not entirely the overall poor state of Russia-US ties that frustrate the potential for more intimate joint coordination between Russia and the United States over North Korea. Rather, it is the perceived lack of economic leverage that Russia has over the North. An improved Russia-US relationship in the realm of international nuclear security would, of course, be to the benefit of the whole world, in a general sense. Yet its significance for Korean disarmament is relatively small.

At the governmental level, Russia-US cooperation is unlikely to substantially shift toward closer cooperation, much less in a direction that Russia favors. Yet as the recent International Luxembourg Forum meeting in London highlights, there is still ample room for exchange between Russia and Western figures outside of government. By using data and open intelligence available to those working outside government, Russia and the US can hopefully continue to foster cooperation and exchange outside of formal channels.

Source: https://www.nknews.org, 15 December 2016.

NUCLEAR NON-PROLIFERATION

INDIA

India Stokes Nuclear Weapon Concern in Bid for Atomic Cartel

India's bid to join the elite club of nations that control nuclear trade continues to stoke concern among arms-control advisers, who warn that membership may undermine rules designed to cap the spread of atomic weapons. Members of the 48-nation NSG meet in Vienna to discuss nine general commitments India and other countries outside the NPT would need to make in order to

receive the fullest atomic trading privileges, according to a two-page document prepared for the meeting and seen by *Bloomberg News*. The meetings are informal and a official plenary won't be convened, according to an NSG spokesman. ...

The remaining concerns over India's nuclear program means that US President Obama's pledge to bring New Delhi into the NSG is likely to go unfulfilled. In a June meeting with Indian PM Modi in Washington, Obama repeated that the world's second-most-populous nation was ready to join the nuclear mainstream. US Secretary of State John Kerry sent a letter pleading with skeptics to let India into the group. The NSG was created in response to India's 1974 atomic bomb test that challenged the credibility of laws written to prohibit nuclear proliferation. Its network of diplomats, customs and trade officials are supposed to prevent the unauthorized transfer of nuclear materials and technologies that could be used in weapons. "China is the principal opponent in the NSG on India's membership," said Tariq Rauf, the director of disarmament and arms control at the Stockholm International Peace Research Institute, in an e-mail. "Traditional nuclear non-proliferation and disarmament supporters such as Austria, Ireland and New Zealand are resisting growing pressure from India, the US and others."

Diplomats have said they're concerned that admitting India before strengthening the NSG eligibility requirements would weaken the rules for other non-recognized nuclear-weapons states to join. Pakistan, India's neighbor and regional rival, has also submitted an application to join the NSG, according to the envoys.

Because NSG decisions are taken by consensus, a minority of members could block India's bid to join. After months of wrangling in 2008, India won NSG trade exemptions – without being granted full membership – giving it access to advanced reactor technologies. Obama began the US campaign to make India a member in 2010. Diplomats have said they're concerned that admitting India before strengthening the NSG eligibility requirements would weaken the rules for other non-recognized nuclear-weapons states to join. Pakistan, India's neighbor and regional rival, has also submitted an application to join the NSG, according to the envoys.

The following nine points will be discussed in Vienna in relation to India's bid to join the NSG:

- Do "clear and strict separation of current and future civilian nuclear facilities from non-civilian nuclear facilities" exist?
- Do documents to the International Atomic Energy Agency identify "all current and future civilian nuclear facilities?"
- Is there an adequate IAEA safeguards agreement "covering all declared civilian nuclear facilities and all future civilian nuclear facilities?"
- Is there a so-called Additional Protocol in effect giving IAEA inspectors the ability "to detect the diversion of safeguarded nuclear material and to ensure that safeguarded nuclear material is used exclusively for peaceful purposes?"
- Is there "a commitment not to use any item transferred either directly or indirectly from a NSG Participating Government" for military purposes?
- Is there adequate "commitment not to conduct any nuclear explosive test?
- Will there be adequate "support of the Comprehensive Nuclear-Test-Ban Treaty upon becoming" an NSG member?
- How will support be given to "strengthen the multilateral nuclear non-proliferation and disarmament regime by working towards the total elimination of all nuclear weapons and enhancing the peaceful uses of nuclear energy?"
- The understanding that should India eventually gain NSG access, it "would join a

consensus of all other Participating Governments on the merits of any additional non-NPT Party applications" like that of Pakistan.

Source: https://www.bloomberg.com,20 December 2016.

India to Chair UN Group on 'Killer Robots'

... On 16 December, 2016, India was selected as the chair of the first group of governmental experts (GGE) constituted to deliberate the issue of Lethal Autonomous Weapons Systems (LAWS) and their impact on international security. New Delhi's role will be crucial to conceiving and articulating the international regime on LAWS – derisively termed "killer robots" technology. If the decision to create a GGE reflects widespread concern that an elite club of countries will deploy and proliferate advanced technologies without clear rules of engagement, India's appointment as chair – Amandeep Gill, its permanent representative to the CD will assume this role – means the country needs to clarify its own thinking and get all stakeholders across different branches of government on the same page. The field is split wide open between developing countries like Egypt, Mexico and Cuba seeking a ban on the use of LAWS, and major powers like the US and Russia on the other, testing and in some cases, deploying them with varying degrees of success.

If the decision to create a GGE reflects widespread concern that an elite club of countries will deploy and proliferate advanced technologies without clear rules of engagement, India's appointment as chair – Amandeep Gill, its permanent representative to the CD will assume this role – means the country needs to clarify its own thinking and get all stakeholders across different branches of government on the same page.

India enjoys credibility as a contracting party to the CCW and is among the few delegations at the CD consulted on emerging plurilateral initiatives, which is likely to have contributed to its selection as the GGE chair. That the Indian line on disarmament, reporting requirements, export controls and proliferation is predictable and consistent with state practice would have also inspired confidence among CCW member states. The Indian representative is a veteran arms control negotiator, and until recently, headed DISA of the foreign affairs ministry in New Delhi.

Theoretically, GGEs in the UN universe comprise "experts" nominated by the government, to maintain sufficient negotiating room for the country's official stand on a subject, but in practice, GGE delegations are almost always headed by diplomats, with legal advisers in tow. GGEs usually germinate in the First Committee of the UNGA set up to tackle "disarmament, global challenges and threats to peace". They are formally set up through a UNGA resolution. The group's report is subsequently submitted to and endorsed by the UNGA, elevating GGE recommendations to a "soft" source of international law. The GGE to examine LAWS, by contrast, owes its origins to the Fifth Review Conference on the Convention on Certain Conventional Weapons (CCW) and will report to its contracting parties. ...

Source: https://thewire.in, 19 December 2016.

IRAN

Iran, IAEA Discuss Nuclear-Powered Boats Program

Head of the Atomic Energy Organization of Iran (AEOI) Ali Akbar Salehi said on 18 December, that his talks with the visiting director general of the IAEA were focused on Tehran's programs to develop nuclear propulsion systems of boats announced recently. IAEA Chief, Yukiya Amano, arrived in Iran's capital Tehran on the 18 December to discuss the implementation of Iranian nuclear deal, known as JCPOA, and the related issues with the senior Iranian officials. Salehi said that his talks with Amano revolved

around Iranian President Rouhani's recent order for reaction to the US "violation of the JCPOA," after the US legislators passed a bill extending Iran Sanctions Act (ISA) for 10 more years. The earlier vote by the US House of Representatives to extend the ISA was endorsed by the Senate.

The White House said in a statement on 15 December that the bill renewing the ISA was becoming law without US President Obama's signature. The White House said that an extension of the bill "is entirely consistent with" the US commitments in the Iran nuclear deal reached in July 2015. The ISA was first adopted in 1996 to sanction Iran over its controversial nuclear program. In a letter to Salehi on 13 December, Rouhani said that "The US has not fully delivered its commitments in the JCPOA," asking Iranian nuclear scientists to start developing systems for nuclear-powered boats in marine transportation. In the letter, he also demanded the Atomic Energy Organization of Iran to plan for designing and manufacturing nuclear propeller to be used in marine transportation with the help of scientific and research centers. Also, they need to conduct study and design production of fuel to be used by the nuclear propeller with the help of scientific and research centers, the letter read.

Rouhani said that "The US has not fully delivered its commitments in the JCPOA," asking Iranian nuclear scientists to start developing systems for nuclear-powered boats in marine transportation. In the letter, he also demanded the Atomic Energy Organization of Iran to plan for designing and manufacturing nuclear propeller to be used in marine transportation.

Enrichment of uranium to run the nuclear propellers may vary from a purity of 5 percent to 90 percent, depending on its type, the purpose and the time available, Salehi said, stressing that all such activities will be carried out in conformity with the Safeguard Agreements. The Iranian nuclear chief also denied that Amano has passed on a message from the US to the Iranians. He also pointed out that the IAEA should remain an impartial and independent body without coming under the influence of any party. Amano will also discuss Iran and IAEA cooperation in technical and safeguard aspects as well as the state of the implementation of the JCPOA.

This is the second visit by the head of IAEA to Tehran following the clinch of the nuclear deal between Iran and the world powers in July 2015 and its implementation in January.The deal between Iran and six world major countries, namely the US, Britain, China, Russia, France and Germany, on the former's nuclear issue put Iran on the path of sanctions relief but more strict limits on its nuclear program.The deal sets limits on Iran's nuclear activities and allows regular inspections of the facilities inside the Islamic republic. In return, the US and the EU will suspend nuclear-related sanctions against Iran.

Source: http://www.china.org.cn/, 18 December 2016.

NUCLEAR TERRORISM

GENERAL

Urgent Need for Global Convention on Terrorism: India

India has criticised the lack of "collective will" for a long-pending global convention on terrorism and called for its urgent adoption, asserting that proliferation of weapons of mass destruction by non-state actors constitutes one of the biggest threats to world peace. "The proliferation of weapons of mass destruction and their means of delivery to non-state actors continues to constitute one of the biggest and most serious threats to international peace and security today," India's Deputy Permanent Representative to the UN Ambassador Tanmaya Lal said at a UNSC debate proliferation of WMDs by non-State Actors'.

He said as a victim of terrorism for over three decades, India is cognizant of the "catastrophic dangers" that the transfer of WMDs to non-State

actors and terrorists could entail. Lal emphasised that it is imperative the international community comes together to eliminate the risks related to sensitive materials and technologies falling into the hands of terrorists and non-State actors. He said meeting new proliferation challenges requires new approaches for evolving a more "cooperative and consensual" international security order that effectively addresses genuine proliferation concerns and "differentiates between responsible States whose actions strengthen non-proliferation and those that weaken the realisation of its objectives". He pointed out that India is committed to maintaining effective law-based controls to prevent the transfer of weapons of mass destruction to terrorist activities and to maintain effective domestic controls to prevent WMD proliferation.

...India will host the Implementation & Assessment Group (IAG) meeting of the GICNT in New Delhi in February next year. In a resolution adopted on 15 December, the 15-member Council expressed concern over the threat of terrorism and the risk that non-State actors may acquire or use nuclear, biological or chemical weapons.The Council called on all countries to establish national controls to prevent proliferation of such weapons as well as their means of delivery. It also reiterated the need to continue to strengthen ongoing cooperation among various intergovernmental bodies and entities concerning terrorist groups such as Al-Qaida, ISIS, as well as counter-terrorism, through enhanced information sharing, coordination and technical assistance. Lal said India welcomes the focus in the resolution on enhanced cooperation with other terrorist sanction regimes and hopes this will lead to strengthening of international cooperation and preventing mechanisms. ...

Source: http://indianexpress.com, 16 December 2016.

New proliferation challenges requires new approaches for evolving a more "cooperative and consensual" international security order that effectively addresses genuine proliferation concerns and "differentiates between responsible States whose actions strengthen non-proliferation and those that weaken the realisation of its objectives

NUCLEAR DISARMAMENT

AUSTRALIA

Australia's No to Prohibit-Nukes Resolution Triggers Debate

As the curtain falls on 2016, the year that marked the fifth anniversary of Fukushima and the 30th anniversary of Chernobyl nuclear disasters, sending a sombre reminder of the devastating humanitarian and environmental consequences of these weapons of mass destruction, the resolve to free the world of nuclear weapons is stronger than ever before.

... Australia, once a champion of nuclear disarmament, chose to oppose the Resolution even as the continent country's nearest 26 neighbours in the Asia-Pacific voted in favour alongside African, Latin American and Caribbean countries. International Campaign to Abolish Nuclear Weapons (ICAN) Australia's Campaign Director, Tim Wright says, "If Australia continues to oppose this long-overdue treaty, it risks alienating other nations in the region. It is deeply regrettable that Australia, instead of standing up for what is morally right and necessary, chose to side with the small number of nuclear-armed nations and others that claim nuclear weapons are legitimate." He adds: "Australia's attempt to derail the UN working group on nuclear disarmament was an extraordinary move, and one that backfired spectacularly. It resulted in a clearer recommendation and strengthened the resolve of other nations to start negotiations in 2017 on a treaty outlawing nuclear weapons."

... Nuclear-armed states and countries that subscribe to the US extended nuclear deterrence for security, such as Australia, Japan and South Korea, had opposed the Resolution. It is worth noting that New Zealand supported the

Resolution, which is consistent with its last over three decades of social and legal history on the issue of nuclear arms. Wright says, "Australia, once a supporter of nuclear disarmament, has in recent years completely abandoned principle on this issue, seizing every opportunity to defend the continued possession and potential use of these worst weapons of mass destruction." New Zealand, Indonesia, Malaysia and Thailand are amongst countries in the region that are likely to play a key role at the negotiating conferences scheduled for March and June 2017 in New York.

Former Chair of the New Zealand Parliamentarians for Nuclear Non-Proliferation and Disarmament (PNND), Maryan Street told IDN, "It is shocking that Australia opposed Resolution L41. There's no rational explanation for it except to state the obvious and that is that their allegiance to the United States overtook all other considerations. Australia has never been in the forefront of the anti-nuclear movement and so it should come as no surprise that it voted the way it did. With a conservative Liberal government, there is clearly no appetite for courage on this issue." Out of the 34 Asia-Pacific countries, which voted on the issue, only four voted against it, namely Australia, Japan, the Federated States of Micronesia and South Korea, and four others – China, India, Pakistan and Vanuatu abstained. ...

Australia has supported global bans on chemical and biological weapons, landmines and cluster munitions. "Australia is committed to the elimination of nuclear weapons pursued in an effective way. However, so long as the threat of nuclear attack exists, the US extended nuclear deterrence serves Australia's security interests", a spokesperson for Australia's Department of Foreign Affairs and Trade (DFAT) told IDN. ... "A nuclear weapons' ban treaty without the participation of countries which possess nuclear arsenals, or without due regard for the international security environment, would be ineffective in eliminating nuclear weapons"....

... Outreach Coordinator for ICAN Australia, Gem Romuld told IDN: "Our work in Australia tells us there is overwhelming public support for a treaty to outlaw nuclear weapons, to clearly stigmatise and rule out any form of Australian involvement in these weapons of mass destruction, for example, by assisting the US with nuclear targeting via the Pine Gap Joint Defence Facility in the Northern Territory. Australia assists the US in its war-fighting efforts by hosting the Pine Gap Joint Defence Facility, a major communications base, which would help nuclear weapons reach their destination in the event of a nuclear war". In recent years, the nuclear armed states have pursued costly programmes to modernise and increase their arsenals. ...

One of the key cooperation areas specified in the memorandum is the post-accident recovery at the Fukushima Daiichi plant, including radioactive waste management and possible decommissioning. In addition, the parties will consider establishing a joint Russian-Japanese platform "to study the possibilities of fostering human resources exchange and exchange of ideas aimed at promoting innovative nuclear technologies based on the knowledge and experience of the two countries.

Source: http://www.indepthnews.net, 15 December 2016.

NUCLEAR SAFETY

JAPAN

Russia and Japan Expand Nuclear Cooperation

Rosatom has signed a memorandum of cooperation in peaceful uses of atomic energy with two Japanese ministries. One key area of cooperation under the agreement will be post-accident recovery at the damaged Fukushima Daiichi plant. The memorandum was signed in Tokyo on 16 December during a meeting between Japan's prime minister Shinzo Abe and Russian president Vladimir Putin. It was signed by Japan's

minister of economy, trade and industry, Hiroshige Seko; the minister of education, culture, sports, science and technology, Hirokazu Matsuno; and Rosatom CEO Alexey Likhachov.

In a statement, Rosatom said one of the key cooperation areas specified in the memorandum is the post-accident recovery at the Fukushima Daiichi plant, including radioactive waste management and possible decommissioning. In addition, the parties will consider establishing a joint Russian-Japanese platform "to study the possibilities of fostering human resources exchange and exchange of ideas aimed at promoting innovative nuclear technologies based on the knowledge and experience of the two countries".

... The company said it has "all competences and experience" to help Japan in recovery efforts at Fukushima Daiichi and that it is "willing to become a partner of Japan in other possible joint mutually beneficial projects in the nuclear power area". The signing of the memorandum follows the signing of a cooperation agreement between the two countries in May 2009.

Source: http://www.world-nuclear-news.org/, 19 December 2016.

NUCLEAR WASTE MANAGEMENT

RUSSIA

Russia's First Nuclear Waste Repository Starts Operation

Russia opened its first ever repository for low and medium level nuclear waste in a major benchmark for the country's radioactive waste handler and facilitated by consultation from Bellona. The project is seen as an important and long overdue step toward securing the Soviet nuclear waste legacy. Alexander Nikitin, chairman of the Environmental Rights Center Bellona – which facilitated and participated in public hearings around the project – called the opening of the repository "the first important step" of Russia's National Operator for Radioactive waste management.

The opening of the repository "the first important step" of Russia's National Operator for Radioactive waste management the 48,000 cubic meter facility in the Sverdlovsk Region's close nuclear city of Novouralsk lies at shallow depth and operates as a repository for what Rosatom classifies as type 3 and 4 wastes.

The 48,000 cubic meter facility in the Sverdlovsk Region's close nuclear city of Novouralsk lies at shallow depth and operates as a repository for what Rosatom classifies as type 3 and 4 wastes. Nikitin said the new site is the first to be built since Russia passed its nuclear waste management legislation, and its launch marks the breaking of a major logjam. The new facility will be able to store solid waste in isolation from the outside environment for 300 years, ten times longer than any other current storage schemes in Russia. He said the new repository was built on the foundation of one of these temporary waste storage facilities. That storage site was rebuilt to the specifications spelled out by Russian legislation. Rosatom added in Russian media that the repository also adheres to requirements spelled out by the IAEA. The waste stored in both the old and new facility, said Nikitin, was then put into the new facility. The waste came from the Ural Electro-Chemical Combine, one of Rosatom's nuclear fuel production facilities.

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Rosatom's head Alexei Likhachev said the opening of the Novouralsk facility represented a shift away

from "deferred decisions" in the area of waste storage. The facility... included both engineered and natural radiation barriers. The Novouralsk site... is the first of several that will open in Russia in the coming years. ...

Rosatom plans to build a repository for type 3 and 4 waste at the closed nuclear city of Ozersk, where the notorious Mayak Chemical Combine is located. Another is planned for the closed city of Seversk in the Tomsk Region. A site for Rosatom types 1 and 2 waste, representing high level nuclear waste, is currently being sited at the Nizhnekansky Rock Mass in the Krasnoyarsk Region. If the rock mass proves suitable for deep geological storage of intermediate and high level waste, construction of the repository could begin in 2024. How much waste the site would hold has yet to be determined.

Source: http://bellona.org, 14 December 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).

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