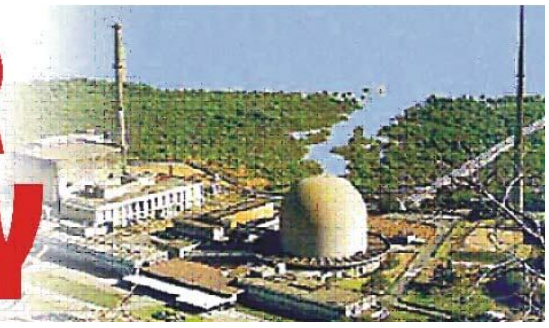
NUCLEAR SECURITY



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

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OPINION – Manpreet Sethi

Summit: Will Koreas Reap Peace Harvest?

North Korea's President, Kim Jong-un, suddenly has a pretty full diary of international engagements. He made his maiden overseas trip to China in March this year to meet Premier Xi Jinping for the very first time. Made with no public announcement, the Summit was obviously important for both sides before President Kim starts engaging with other leaders on the knotty nuclear concerns that his nuclear and missile activities have generated across the world.

For Kim, the optics of the Chinese support is important in order to create the necessary maneuvering space during his negotiations with his neighbor, the Republic of Korea, as also his main adversary, the USA. Meanwhile, for China the meeting with Kim Jong-un was important to underline its own relevance to the resolution of the nuclear imbroglio after having let the impression take root that Beijing's leverage with Kim Jong-un had reduced over time. Though nothing of real substance about what transpired between the two has been officially revealed, it can be safely surmised that the two would have had a heart to heart exchange on what they desire from each other, as well as on how to engage with Seoul and Washington in the coming meetings.

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The Presidential summit between Kim Jong-un and Trump is still a month or so away. But, in April is scheduled another important Summit between Presidents Moon Jae-in and Kim Jong-un. An air of tentative anticipation hangs over Seoul in the run up to 27 Apr 2018. An inter-Korean summit preparation committee has already met four times to carry out agenda identification. This is important since the two sides must approach the long standing issue of inter-Korean ties with a sense of clarity on expected outcomes. Unnecessary burdening of the interaction with

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all issues of mistrust and concerns that bedevil the relationship would be a sure way to derail it right at the beginning. So for now, ROK has identified three major issues – denuclearization, inter-Korean relations and establishing peace. ROK has expressed its willingness to maintain a flexible approach for a candid and inclusive dialogue. Moon administration has also gone to the extent of not including the issue of human rights violations in North Korea so as not to overload this historic Summit.

Yet, there is no guarantee that the talks might not stumble right at the beginning over the very definition of denuclearization. This much used term by all sides actually means different things for DPRK, ROK and even the USA. South Korea seeks a complete abandonment of the nuclear programme by Pyongyang, which means mothballing of the existing facilities under international verification in order to have a nuclear free North Korea. It argues that it has already lived up to its own part of the denuclearization pact when the US removed nuclear weapons from ROK following the Joint Declaration on Denuclearization of the Korean Peninsula signed by the two countries on 31 Dec 1991. For DPRK though, denuclearization also includes the formal revocation of the nuclear umbrella extended by Washington to Seoul, withdrawal of American troops from the Korean Peninsula, and the signing of a peace treaty.

While all balls are presently up in the air, perhaps, one way of defining the meetings as successful may be if the top leaderships could arrive at a formulation of something like a joint statement that broadly outlines the vision of a peaceful relationship, and which supports the process of further talks to flesh out details.

Besides these definitional issues that will complicate the coming negotiations, it can also be expected that alliance coordination will cast a shadow on the Summits. Given that Presidents Moon and Trump do not necessarily see eye to eye on everything connected with North Korea, this will allow greater space to Kim Jong-un to play one against the other. At the same time, China's relationship with not only Pyongyang and Seoul but also Washington will bring in its own dynamics.

Seoul is the most affected party to the outcome of these Summits, but the DPRK is actually interested in striking a deal with Washington. For Washington, staying true to its alliance commitments with Seoul is important for the sake of continued credibility of its extended deterrence to other non-nuclear countries. But, President Trump could be interested in an out of the box solution that seals his legacy. China, on the other hand, is certain to ensure that any situation that emerges does not impinge on its security interests in any adverse way.

Simply put then, the current interplay of inter-state equations and the presence of hard-nosed, nationalist leaders in each country of relevance will impact the outcome. Much is riding on this season of the Summits. While all balls are presently up in the air, perhaps, one way of defining the meetings as successful may be if the top leaderships could arrive at a formulation of something like a joint statement that broadly outlines the vision of a peaceful relationship, and which supports the process of further talks to flesh out details. Obviously, one summit cannot suffice for resolution of such a protracted problem. But, the very articulation of the continued pursuit of a new security paradigm could be a rich harvest of this season of summitry. In other words, let's keep our expectations low, and hope to be surprised.

Source: https://www.deccanherald.com, 25 April 2018.

OPINION – K.S. Parthasarathy

Nuclear Legacy Trap: Myths and Reality

General Vinod Saighal's eminently readable, lucid opinion piece (The Statesman April 2) reflects the concerns of vast sections of the public. He argues persuasively against setting up nuclear power plants because he feels that these plants will form a very expensive nuclear legacy trap for future generations because of decommissioning and nuclear waste disposal issues.

His article highlights the seemingly unbridgeable communication gap between public and the nuclear community. Mired in controversy, the myths about decommissioning and nuclear waste management survive; the realities may remain unknown if nuclear community does not come out of their comfort zones and convey information to all sections of the public. Trust deficit of decision makers at higher levels of Government is not a welcome sign.

According to an authentic review "over 115 commercial power reactors, 48 experimental or prototype reactors, over 250 research reactors and several fuel cycle facilities have been retired from operation. Some of these have been fully dismantled".Most parts of a nuclear power plant do not become radioactive, or are contaminated at only very low levels. Most of the metal can be recycled.

A book (The Trap) by Sir James Goldsmith reinforced Saighal's apprehensions. The 1990 vintage book does not contain information on the latest advances on decommissioning of nuclear power plants and management of nuclear wastes. Indian scientists have adequate experience in decommissioning of research reactors, reprocessing plants and nuclear facilities.

According to an authentic review (World Nuclear Association, March 2018), "over 115 commercial power reactors, 48 experimental or prototype reactors, over 250 research reactors and several fuel cycle facilities have been retired from operation. Some of these have been fully dismantled".Most parts of a nuclear power plant do not become radioactive, or are contaminated at only very low levels. Most of the metal can be recycled. Proven techniques and equipment are available to dismantle nuclear facilities safely and these have now been well demonstrated in several parts of the world," the WNA report added.

Scientists have developed technology to incorporate high-level nuclear wastes into glass (vitrification) to make them non-dispersible. Glass is least soluble even in hot, salt water. The vitrified waste after suitable capsulation (for instance in copper canisters) can remain safely in deep underground repositories for thousands of years. By 2025, Sweden and France will move high-level waste to their permanent underground sites. Finland will move its HLW in 2020.

Other countries can follow these steps or even outsource waste management to France, Finland or Sweden, the real masters of the technology. India has been operating vitrification plants for many years. The October 2013 issue of Sadhana, a journal published by the Indian Academy of Sciences vividly describes India's nuclear waste management programme.

General Saighal rightly talks about the huge funding requirements. The NPCIL collects two paisa per unit of electricity produced towards decommissioning funds. In 2016-17, NPCIL collected Rs 753 million. Evidently, vast sums will be available for decommissioning the reactors one by one after 40-50 years of operation.

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Decommissioning nuclear power plants and nuclear waste management are no more insurmountable; we have the technology and the funds. The current generation need not feel guilty about any "Nuclear Legacy Trap" as feared by General Saighal. Many NGOs and others published grossly exaggerated reports on Chernobyl and Fukushima In 2005, The Chernobyl forum made up of eight specialized agencies such as the WHO, the IAEA, ILO etc of the UN published Chernobyl's Legacy: Health, Environmental and Socio-Economic Impacts" a landmark report. It is available online and offers the factual position.

Specialists found that "childhood thyroid cancer

caused by radioactive iodine fallout is one of the main health impact of the accident. By 2002, more than 4000 thyroid cancer cases had been diagnosed in this group, and it is most likely that a large fraction of these thyroid cancers is attributable to radioiodine."

Apart from this, "there is no clearly demonstrated increase in the incidence of solid cancers or leukaemia due to radiation in the most affected populations. There was, however, an increase in psychological problems among the affected population" the report added.

After a comprehensive assessment, "experts on the health risks associated with the Fukushima Daiichi nuclear power plant disaster in Japan has concluded that, for the general population inside and outside of Japan, the predicted risks are low and no observable increases in cancer rates above baseline rates are anticipated." (WHO Press Release, 28 February 2013)

"The estimated risk for specific cancers in certain subsets of the population in Fukushima Prefecture has increased and, as such, it calls for long term continued monitoring and health screening for those people", the experts cautioned. NGOs spread conspiracy theories (such as WHO is under the thumb of IAEA, the promoter of nuclear energy!). It enhances the trust deficit between public and the UN agencies. Radiation specialists know the truth.

Regrettably, General Saighal copied five paragraphs (373 out of 955 words in his article) from Robert Hunziker, who regularly writes in COUNTERPUNCH (claims to do fearless muckracking!) and Professor Bernard Lowen, one of the founders of the International Physicians for the Prevention of Nuclear War (IPPNW) without any attribution. Hunziker's article is Saighal's major resource. (Note: General Saighal did attribute the words in question to Hunziker; the attribution was accidentally omitted during editing – Ed.S.)

The paragraphs quoted by Saighal deal mainly with Chernoyl and Fukushima. Robert Hunziker extensively quotes from Professor Adam Broinoski, another prolific writer whose claims on the plight of "liquidators" at Chernobyl are unfounded. Chernobyl accident was devastating; the site is slowly recovering.

Fukushima site continues to be a challenge. Realizing that this need not be a disincentive against nuclear power, the Japanese started seven nuclear power reactors. They know that Fukushima was preventable. Survival of Onagawa nuclear power plant which faced the same earthquake and 14.3-metre tsunami as against 13.1 meters at Fukushima, because of "safety culture" gives them confidence.

Fukushima site continues to be a challenge. Realizing that this need not be a disincentive against nuclear power, the Japanese started seven nuclear power reactors. They know that Fukushima was preventable. Survival of Onagawa nuclear power plant which faced the same earthquake and 14.3-metre tsunami as against 13.1 meters at Fukushima, because of "safety culture" gives them confidence.

If General Saighal and others for whom anti nuclear sentiment seems to be an article of faith read about Onagawa (*The Bulletin of Atomic Scientists*, 10 March 2014) and appreciate the technological developments in decommissioning of nuclear power plants and waste management, they may change their views or may at least look at nuclear power more benignly.

Source: https://www.thestatesman.com/opinion, 22 April 2018.

OPINION – Gregory Kulacki

Japan's Nuclear Hawks Could Block US-North Korean Agreement on Denuclearization

Momentum has been building for a productive meeting between President Trump and Kim Jung-un that could lead to an agreement on North Korean denuclearization. But after speaking with Japanese Prime Minister Shinzo Abe, Trump warned the world that he might cancel or walk out of the meeting if "it is not going to be fruitful."

What did Mr. Abe tell Mr. Trump that precipitated the warning? The prime minister may have reminded the president that his Nuclear Posture Review, which the Japanese Foreign Ministry strongly endorsed, included US promises to increase the role of US nuclear weapons in Asia. The ministry could be trying to prevent any weakening of those promises from becoming part of an agreement with North Korea on denuclearization.

***Defining Denuclearization**:* US and foreign observers have disagreed about the meaning of the term. But North Korea has made it clear that it considers denuclearization a mutual responsibility. The United States has acknowledged reciprocal denuclearization obligations in the past, but they were limited to the Korean land mass.

If North Korea were to ask for a broadening of reciprocal US obligations to denuclearize the region as a condition for relinquishing its nuclear capabilities, the United States may have to walk back some aspects of the extended nuclear deterrence commitments it made to Japan during the Obama administration and cancel plans to further enhance those commitments—plans included in the Trump administration's Nuclear Posture Review.

US negotiators should be aware that North Korean conditions for a credible security guarantee may include a slightly broader definition of US denuclearization obligations and some additional US relaxation of its nuclear posture in Asia. In July 2016 Pyongyang stated that denuclearization means "denuclearization of the whole Korean peninsula and this includes the dismantlement of nukes in South Korea and its vicinity."

This would not be an unreasonable request. Nuclear-capable US aircraft and submarines patrolling in the region are just as threatening to North Korea as US nuclear weapons stationed on the peninsula itself. The United States has used displays of regional nuclear capabilities, such as nuclear-capable bombers deployed to Guam, to threaten North Korea in the past. North Korean threats to attack Guam with medium range missiles were a response to those displays, and a prominent part of the tense fall run-up to this spring's negotiations.

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***Japanese Nuclear Preferences**:* On 25 February 2009 Minister Takeo Akiba, who headed the political section of Japan's embassy in Washington, presented a document to a US congressional commission stating President Obama assured Prime Minister Aso, at a meeting in Washington the day before, that the United States would honor the Japanese Foreign Ministry's request to make nuclear deterrence "the core of Japan–US security arrangements." The document contained a list of US nuclear weapons capabilities the ministry believed were needed to make that assurance credible.

The list included US nuclear weapons that could be deployed in the region, including nuclear-capable cruise missiles on US attack submarines that patrol in Asia and nuclear-capable aircraft on the island of Guam. A conversation about the list between Mr. Akiba and commission co-chair James Schlesinger included consideration of deploying US nuclear weapons on US military bases on the Japanese island of Okinawa. Mr. Akiba, who is now Japan's Vice Minister of Foreign Affairs, explained that domestic political conditions in Japan made deployment in Okinawa problematic. But he also noted that there is a constituency within Japan's Foreign Ministry that supports deployment and he appeared to agree to construct storage facilities for US nuclear weapons in Okinawa in anticipation of eventual

deployment when political conditions in Japan change.

The Obama administration permanently retired the nuclear-capable cruise missile the United States once deployed on US attack submarines patrolling in Asia. US President George H.W. Bush removed them from service in 1992. But Obama reportedly agreed to compensate for the loss of this capability by making US nuclear weapons available for deployment in Asia aboard dual-capable aircraft. The Trump administration, noting the importance of the capability to deploy US nuclear weapons in Asia, plans to build a new submarine-launched nuclear-capable cruise missile to replace the one his predecessors removed from service and retired.

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Reciprocal Verification: The United States expects North Korea to agree to verifiable measures to halt the development of new nuclear weapons, eliminate its existing nuclear weapons and dismantle its ability to reconstitute its nuclear weapons program in the future. It is only reasonable to expect that North Korea would require credible assurances that the United States will not introduce or threaten to introduce US nuclear weapons into the region in the future.

Concession in the interest of avoiding a war with the North. But Trump's unexpected threat to cancel or walk out of a summit meeting with Kim Jung-un, announced while standing next to Japan's prime minister after two days of meetings, suggests Abe may have told the US president that exchanging the option to deploy US tactical nuclear weapons in Asia for a deal on denuclearization with North Korea would not be "fruitful.

The United States could agree to such a request without diminishing its ability to provide extended nuclear deterrence to its Asian allies with its strategic nuclear forces, which do not need to enter the region to be effective. But it would have to forgo whatever psychological advantages it presumes to obtain by maintaining the ability and expressing the will to deploy US tactical nuclear weapons in Asia if deemed necessary.

South Korea seems to be prepared to make this concession in the interest of avoiding a war with the North. But Trump's unexpected threat to cancel or walk out of a summit meeting with Kim Jung-un, announced while standing next to Japan's prime minister after two days of meetings, suggests Abe may have told the US president that exchanging the option to deploy US tactical nuclear weapons in Asia for a deal on denuclearization with North Korea would not be "fruitful."

Source: Union of Concerned Scientists, 22 April 2018.

OPINION – Chang-Hoon Shin

Did North Korea Really Commit to Denuclearisation?

Since the Korean Peninsula was divided into North and South, immediately after liberation from Japan in 1945, a tragic saying has become common among South Koreans: "Everybody is irrational whenever encountering any North Korea problem." The saying reflects the history of love and hate towards North Korea by South Koreans, which has worked like a powerful magic spell. Never has any South Korean expected that the spell would work on foreigners as well, but astonishingly, the unexpected has happened.

On April 21, Ri Chun-hee, a news presenter at the North Korea's media KCTV, read out a resolution titled "On proclaiming great victory of the line of simultaneous development of economic construction and building of nuclear force", which had been adopted unanimously at the plenary meeting of the ruling party's central committee a day earlier. Quite irrationally, media outlets around the world put up breaking news

headlines that North Korea has decided to suspend nuclear and intercontinental ballistic missile tests. Some heads of state rushed to release welcoming remarks on North Korea's decision, deeming it evidence that the country has committed to denuclearisation.

Some of the media also praised the decision, but interestingly, did not quote, intentionally or not, the title or the text of the resolution. A closer look at the wording of the resolution reveals that North Korea has not really committed to denuclearisation. So let's take a look at the text.

The title of the resolution makes it clear that the announcement was made to "celebrate" the great victory of North Korea's simultaneous development of economic construction and building of nuclear forces (the so-called "byungjin" policy in Korean), not to "pledge" commitment to denuclearisation.

North Korea's possible stance in the upcoming talks with US President Donald Trump. The paragraph states that stopping further nuclear tests is an important part of "worldwide disarmament". It is important to note here that the North Korean regime refers to "disarmament" and not "denuclearisation.

The first paragraph of the resolution says that North Korea has conducted clandestine subcritical nuclear tests even under harsh sanctions. The world knows that it has conducted six underground tests so far, but has had no information about the subcritical tests.

Since relevant United Nations Security Council resolutions have explicitly prohibited any kind of action leading to the development of nuclear weapons, this basically constitutes a confession from the North Korean regime that it violated these UNSC decisions. In making this public, North Korea must have hoped that the clandestine subcritical nuclear tests would be overlooked. In fact, if there is no official condemnation, today, of these tests, in the future, Pyongyang might see it as a sign that it has been forgiven.

The second paragraph declares that North Korea has decided to stop the tests and shut down a nuclear test site. While this may appear a significant step towards denuclearisation, this is no more than the fulfilment of a precondition for talks set by China and Russia. The text makes mention of a commitment to the treatment of neither fissile materials nor nuclear warheads and the facilities for their production. Moreover, the usefulness of the test site is questionable and the testing site may have suffered negative environmental effects.

The third paragraph hints at North Korea's possible stance in the upcoming talks with US President Donald Trump. The paragraph states that stopping further nuclear tests is an important part of "worldwide disarmament". It is important to note here that the North Korean regime refers to "disarmament" and not "denuclearisation".

In the fourth paragraph, the text says that North Korea will never use nuclear weapons or transfer them, or nuclear technology, under any circumstance, short of a nuclear threat and provocation against the nation. The paragraph is basically its nuclear doctrine and demonstrates that North Korea now perceives itself as a nuclear state.

The fifth paragraph reads that North Korea "will concentrate all efforts on building a powerful socialist economy and markedly improving the standard of people's living through mobilisation of all human and material resources of the country." One may argue that this may be interpreted as North Korea giving up building a nuclear arsenal, a pillar of its byungjin policy. On the other hand, it is much more likely that this statement is just a declaration of priority shift after the successful completion of its nuclear project and an expression of the regime's desire to have economic sanctions lifted.

The resolution concludes by saying that North Korea "will create an international environment favourable for the socialist economy construction and facilitate close contact and active dialogue

with neighbouring countries and the international community in order to defend peace and stability on the Korean Peninsula and in the world." This could, indeed, be perceived as a positive message about the regime's commitment to diplomacy. But keeping in mind that the North Korean regime almost entirely depends on support from China, which has not pushed for the denuclearisation of North Korea, one has to accept these words with a grain of salt.

Engaging North Korea in a dialogue is indeed crucial but we must not be naive about the intentions of its regime. Misunderstanding the messages coming out of Pyongyang could be a huge obstacle to the success of talks in the long run.The international community should continue to insist that North Korea return to observing the NPT and commit to genuine denuclearisation.

Source: Chang-Hoon Shin is a non-residential senior research fellow at the Korea Institute for Maritime Strategy, https://www.aljazeera.com/, 23 April 2018.

OPINION – Abigail Sah, et al.

Sub-Saharan Africa and Nuclear Energy

In the face of increasing concern about human-caused climate change, there is an urgent need for a global transition to clean energy. Yet in many parts of the world, such as sub-Saharan Africa, there is also a need for significant increases in energy consumption to improve human development. One pathway to meet these twin challenges of alleviating energy poverty and minimising greenhouse gas emissions is nuclear energy.

Despite being home to a diverse range of energy resources – from oil and gas in the west to strong hydro-potential in more central regions – Africa still lays claim to severely underdeveloped power sectors in most of its sub-Saharan countries. Instead, the region faces a power infrastructural deficit requiring upwards of USD90 billion annually to resolve.Taken together, the 48 countries that make up sub-Saharan Africa generate approximately the same amount of power as Spain, despite having a population that is 18 times larger. As of 2012, the sub-Saharan 48 had a mere 83 GWe of total grid-connected generation capacity, with South Africa alone accounting for more than half of that.

Access to Electricity: The International Energy Agency's Africa Energy Outlook - a Special Report in the 2014 World Energy Outlook series – indicates that some 625 million people in Africa do not have access to electricity, while another estimated 730 million Africans on the continent use dirty and potentially hazardous fuels to cook. Furthermore, average per capita residential electricity consumption was placed at 317 kWh per year. Yet despite these meagre numbers, between 1990 and 2013 only USD45.6 billion was invested in the power sector - that is, half of what is required annually. Sub-Saharan Africa has therefore found itself in a situation where its rapidly growing population, expected to reach 2.8 billion by 2060, urgently requires innovative energy solutions capable of guaranteeing a sustained growth in energy supply.

There is the argument that, since nuclear power plants have fewer siting constraints due to the small size and extremely dense fuel, they could be located closer to load centres to avoid the transmission costs, which could be high in African countries where there are larger distances between significant population centres.

Historically, many emerging economies have turned to nuclear power to meet energy deficits, and there is immense potential for nuclear to provide a clean baseload source of energy to meet Africa's large energy deficit while also minimising carbon emissions. Fossil fuel power plants like oil, coal, and gas not only pollute but must have a constant delivery of fuel, which can be a challenge where transportation and pipeline infrastructure is underdeveloped.

There is the argument that, since nuclear power plants have fewer siting constraints due to the small size and extremely dense fuel, they could be located closer to load centres to avoid the transmission

costs, which could be high in African countries where there are larger distances between significant population centres. Additionally, nuclear technology could be used for other non-power uses on the continent such as desalination and industrial process heat.

Challenges: Despite the potential of and interest in nuclear power in sub-Saharan Africa, there remain significant challenges to adopting the technology on the continent. For one, current NPPs on the market, at a power rating of 1000 MWe or more, exceed the capacity that many African countries can support. (There is a rule of thumb that no power plant in a country should have a capacity that exceeds 10% of that country's total grid capacity.) High capital costs, low human capital, weak institutional quality, long times required to develop robust legal and regulatory frameworks, and proliferation concerns of nuclear fuel also serve as barriers to the adoption of nuclear technology on the continent. For these reasons, only South Africa has an operating nuclear power plant, with 1800 MWe of capacity made up of two units of pressurised water reactors. South Africa plans to expand its nuclear capacity by 9600 MWe and aims to increase the share of the country's electricity from nuclear from 5% to 25% by 2025.

The challenges are considerable, but there is reason for optimism. Small Modular Reactors (SMRs) and advanced nuclear technologies could improve the feasibility of developing commercial nuclear power in African countries. Through smaller reactor sizes, passive safety, and simplified design, these new nuclear technologies could be easier to finance, construct, and operate.

The challenges are considerable, but there is reason for optimism. Small Modular Reactors (SMRs) and advanced nuclear technologies could improve the feasibility of developing commercial nuclear power in African countries. Through smaller reactor sizes, passive safety, and simplified design, these new nuclear technologies could be easier to finance, construct, and operate.

A Decade Away: We find that there is significant interest in and steady progress towards commercial nuclear power in sub-Saharan African countries. Yet most countries are still a decade away at least from breaking ground on their first project. Advanced nuclear designs have the potential to mitigate some of the challenges of deployment in this region, but they are also about a decade away from first commercial demonstration. Perhaps a confluence of these two events will allow African countries to leapfrog over the large-scale, traditional light-water nuclear technologies to nuclear technology that is smaller, modular, more flexible, and overall more appropriate.

Development organisations that focus on energy issues should stay informed about the progress these countries are making on nuclear and should consider the technology in their ongoing discussions around options for increased energy access. Even compared with other newcomer nuclear countries, it is clear that no sub-Saharan African country is ready to build its first commercial nuclear power plant in the next five years. Even in South Africa, which already has commercial nuclear power, plans to build an additional 9.6 GWe of nuclear have stalled over questions of financing. Nonetheless, we need to recognise that there is great interest and demand for nuclear across the African continent, and nuclear vendors are keenly aware of this.

Even compared with other newcomer nuclear countries, it is clear that no sub-Saharan African country is ready to build its first commercial nuclear power plant in the next five years. Even in South Africa, which already has commercial nuclear power, plans to build an additional 9.6 GWe of nuclear have stalled over questions of financing.

Advances: Competition among the major vendors - Russia, China, and South Korea - may also accelerate deployment by lowering costs and

providing more services within the scope of the project. Dozens of Nuclear Cooperation Agreements and Memoranda of Understanding have been signed with these countries, ranging from research and development and human resources development to full reactor projects. Such agreements will only continue to expand and grow in value.

Critically, we must consider how technological advances in nuclear power may change what is feasible in Africa. New reactor designs that are smaller, simpler, and safer may accelerate the deployment of commercial nuclear in these sub-Saharan countries. And new business models such as Build-Own-Operate, offshore nuclear, or vendor-financed projects, may help leapfrog limited state capabilities.

SMRs could lower the barrier for grid capabilities, allowing smaller countries access to nuclear. And the Build-Own-Operate model popularised by Rosatom could help countries overcome the financial, human capital, and regulatory obstacles of their first plants. Still, nothing can circumvent the need for a robust safety and security regulator, nor the transparency and safeguards set in place by the International Atomic Energy Agency.

Requirements: In the short term, we expect to see more progress on regulatory and infrastructure milestones. Countries will likely sign many more MOUs and NCAs with major reactor vendor countries such as Russia, China, and South Korea. In the longer term, we expect one to five countries in Africa to begin commercial nuclear programs, most with the help of a foreign reactor vendor.

Given the key role that energy plays in advancing human development, what role does the development community play in the nuclear space? We have seen that the major development banks have prohibited investments and often even conversation around nuclear power. But as they also phase out investment in fossil fuels, and as concern around climate change grows, they should consider relaxing these restrictions.

More importantly, nuclear development in sub-Saharan countries is currently dominated by foreign companies, which may not always have the interests of the host country as a priority, although their investment role is critical. Therefore, the development community is greatly needed in facilitating these challenging conversations around transparency, equity, good governance and human capital. There is more work to be done in convening workshops across these countries to standardise norms and best practices around emerging nuclear technologies.

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Finally, there is a critical need for independent voices to educate and engage with potential host communities around the benefits and risks of nuclear power, such that host communities know their rights and are empowered to negotiate fair contracts for potential nuclear power facilities in their backyard.

Source: http://www.world-nuclear-news.org, 23 April 2018.

OPINION – Anne-Charlotte Dagorn

Gender Diversity in the UK Nuclear Industry

For the UK to remain a global engineering force to be reckoned with, we need to ensure that nuclear and engineering projects are deployed on time, delivered to the highest standard and drive continuous innovation. As our global economy advances, engineering will play an ever more increasing and vital role in driving our economy, building infrastructure and creating employment.

In 2015, analysis by the Centre for Economics and Business Research shows that the gross value added (GVA) for the UK by the engineering sector was GBP433 billion (USD617 billion). This was more than retail, wholesale, financial and insurance sectors combined, yet only 5.7 million employees work in engineering enterprises in the UK, representing just over 19% of total UK

employment in all respected enterprises. Something needs to be done.

Moreover, it is estimated that engineering companies need 265,000 new employees per year until 2024 in order to keep up with current projects. Current nuclear projects, such as EDF's Hinkley Point C power station in Somerset, is in need of tens of thousands of engineers. However, current engineering graduate supply falls well short of demand. Statistics highlight that postgraduate engineering is successful internationally, but the proportion of UK graduates is becoming too low to be sustainable in the long term, in turn hindering the gender diversity balance.

The UK is in an engineering skills deficit, but more so for women. The number of men and women in the nuclear sector is extremely imbalanced, especially in leadership roles. While women make up 46% of the UK workforce as a whole, engineering continues to remain a male-dominated industry. In 2017, statistics highlighted that women made up only 1 in 8 of those in engineering occupations and less than 1 in 10 of those in an engineering role within an engineering company.

Research clearly shows that the UK is in an engineering skills deficit, but more so for women. The number of men and women in the nuclear sector is extremely imbalanced, especially in leadership roles. While women make up 46% of the UK workforce as a whole, engineering continues to remain a male-dominated industry. In 2017, statistics highlighted that women made up only 1 in 8 of those in engineering occupations and less than 1 in 10 of those in an engineering role within an engineering company.

With that said, gender diversity has dominated both political and media agendas for years, with numerous high-profile politicians, large corporations and notable public figures acknowledging that more needs to be done to work towards closing the gender disparity. It's time we turned this acknowledgement in to action! As a nation we face unprecedented challenges, whether environmental, technological, political or economic. Our capacity to tackle them will be greatly improved by ensuring a gender-balanced representation of women in nuclear and engineering. With a more diverse workforce, businesses will benefit from a range of different skills and perspectives which can drive business objectives and goals and ultimately service customers better.

Understanding that women not only have as much to offer as men, but just as much ambition, is a major challenge for businesses and our society as a whole. Without being open-minded we risk failing to acknowledge a historic turning point - the key transition from quota-based achievements to an era of driving through diversity.

For this to happen, our political leaders and businesses must make a number of strong commitments. First to guarantee pay equity, otherwise no ambition can sustainably match individual commitment. Secondly, to provide women with an environment and a management approach that factors in the cognitive biases specific to men and women. We can do this by avoiding all forms of stereotyping surrounding women in our industry. In particular, this lies with eradicating beliefs that heavy industry jobs are not for women and instead we need to promote our industry as one that women can work in.

Women should be actively encouraged to participate in STEM subjects (science, technology, engineering and mathematics) while at school. But collaboration is key to this. Both at a business and national level, we need to focus more on promoting STEM subjects to women in order to build and grow our industry.

And what this requires is the industry and government to collaborate and better work together to promote and support women in the nuclear and engineering industry, starting in schools. Women should be actively encouraged to participate in STEM subjects (science, technology, engineering and mathematics) while at school. But collaboration is key to this. Both at

a business and national level, we need to focus more on promoting STEM subjects to women in order to build and grow our industry.

Additionally, with preparation and research, there are opportunities for our industry to work in tandem more than ever before. The industry needs to collectively work towards enhanced opportunities; better supporting industry talent, while driving new, younger talent to enter the ever-demanding industry. Our main aim should be to address the gender imbalance, change behaviours, and promote female leadership in order to have more women at all levels of a corporation.

One thing remains certain, we can already see change here at Assystem across the board. In 2010, only 22% of our recruits were women, compared with 30% today, and by 2020 our aim is to make this 40%. Additionally, in 2010, only 11% of our managers were women but this has since increased to 16%. We're working hard to ensure that these figures increase. In the meantime, we urge our industry to come together and actively support and promote women in engineering and nuclear.

Here at Assystem, we have launched the #IncredibleWomen programme to promote women across the energy industry. The programme is aimed at promoting scientific and technical subjects among female students and giving them career opportunities within the group. Centred around the theme of ambition, the programme's aim is to empower women within the company. We've launched the programme in France, and will be rolling out the programme in Switzerland, Belgium, United Kingdom and the Middle East in due course.

As more companies strive for equality, there is hope that those discoveries will lead to women achieving long and fruitful careers in the nuclear and engineering sector. One thing remains certain, we can already see change here at Assystem across the board. In 2010, only 22% of our recruits were women, compared with 30% today, and by 2020 our aim is to make this 40%. Additionally, in 2010, only 11% of our managers were women but this has since increased to 16%. We're working hard to ensure that these figures increase. In the meantime, we urge our industry to come together and actively support and promote women in engineering and nuclear.

Source: http://www.world-nuclear-news.org, 13 April 2018.

OPINION – Arushi Vig

The Nuclear Consequences of Brexit

After the 2016 Brexit verdict, one area of several areas of concern is nuclear energy. The British civil nuclear programme was meshed with Euratom since the UK's inclusion in the EU in 1973. One consequence of Brexit is Prime Minister Theresa May's seeming determination to part ways with all EU institutions including Euratom. This article evaluates the consequences both for the UK as well as Euratom.

Euratom was set up by EU member states to create a specialist market for nuclear power in Europe. It also oversees the nuclear industry of its members; ensuring free, safe and quick transportation of nuclear materials and manpower, synergising research, and synchronising safety standards, among others. Consequently, one of the first implications of Brexit would be the costs, which could go up to a few billion pounds, for developing new safety norms and procedures, as it implies the creation of domain knowledge and the associated costs of duplication, including setting up a new agency.

Euratom was set up by EU member states to create a specialist market for nuclear power in Europe. It also oversees the nuclear industry of its members; ensuring free, safe and quick transportation of nuclear materials and manpower, synergising research, and synchronising safety standards, among others. Consequently, one of the first implications of Brexit would be the costs, which could go up to a few billion pounds, for developing

new safety norms and procedures, as it implies the creation of domain knowledge and the associated costs of duplication, including setting up a new agency. Also, a Euratom exit could initially cause delays in materials and manpower which could have a negative impact on UK's medical industry specifically in the field of chemotherapy where nuclear energy is explicitly used.

If the UK leaves the Euratom, all its complex nuclear treaties with the US and the rest of Europe which mesh into an international web would need to be re-ratified in national legislatures and the UK. This is a large international legislative task. If the treaties are not re-ratified by national parliaments on time, then, depending on the treaty, the UK could possibly be in breach of the NPT because of the delay caused.

If Brexatom were to occur, it could also cause the UK to lose its association with EU countries as well as other major powers such as the US and Japan. Since joining in 1973, any nuclear treaties with other countries (including any signed before that date) were placed under the aegis of Euratom. If the UK leaves the Euratom, all its complex nuclear treaties with the US and the rest of Europe which mesh into an international web would need to be re-ratified in national legislatures and the UK. This is a large international legislative task. If the treaties are not re-ratified by national parliaments on time, then, depending on the treaty, the UK could possibly be in breach of the NPT because of the delay caused.

Internally, the British government remains divided regarding its exit from Euratom. MPs in the upper house of parliament maintained the stance that the country should not leave Euratom till a replacement deal is found, voting 194 out of 265. However the PM has explicitly stated that she wants to cut ties with all organisations of the EU, specifically those that come under the jurisdiction of the European Court of Justice (ECJ).

Additionally, the UK does not have the same active nuclear research base it once had. Although the UK has more extensive experience of decommissioning than its European partners, this is not uniquely specialised knowledge, and most of the private companies involved are multinational. While Euratom allowed a highly skilled British workforce to benefit from a large Europe-wide ecosystem of research, the prospects of an NPT breach or of a manpower shortage would all severely affect the possibility of cooperation, including and especially research.

Despite all this, there remains a point of view that the Euratom does not remain the same viable nuclear agency it was and had been destroyed by a powerful member state, Germany. Germany's nuclear net capacity of 10.799 MWe (the second highest in the EU), and a total of 8 power plants were severely shrunk with its announcement to terminate its nuclear power plants by 2022 in the wake of the Fukushima incident. Its decision to forego the nuclear option significantly reduced the market viability of European civil nuclear research and cooperation. Aside from Germany, Europe's lack of public consultations, its old treaty systems, and limited role of the European Parliament in overseeing Euratom had made it a public relations disaster. Also, the UK possess the second highest number of power plants in the EU and a net capacity worth 8.918 MWe. Brexit therefore would further weaken Euratom, already reeling from the German decision and compounded by the fact that the UK is a powerful pro-nuclear voice in the organisation.

However for Britain, the dilemma would still be who would inspect British civil nuclear sites that generate power, fabricate fuel and manage waste. Euratom and the IAEA oversee them now, although the IAEA has scaled back because of overlap. Additionally, Euratom includes other powerful members such as France which has a total of 58 reactors and a net capacity of 63.130 MWe and Sweden with 10 reactors and a net capacity worth 9.651 MWe. Thus the benefits reaped by the UK from Euratom are much more than the other way round.

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There were talks of an associate membership with Euratom once the UK leaves the EU but speculations still surround the case, such as the future of the UK's research funding, its continued inclusion in the European Economic Area (EEA), and whether the UK would still invest in European projects such as the ITER fusion reactor project in France. These impending queries and the complexities associated with it have made an associate membership almost impossible. Both sides would be adversely affected by Brexatom. However, the pain will be disproportionately felt by the UK, and this is what the government must remember as it negotiates the nuclear aspects of Brexit.

Source: http://www.ipcs.org/, 19 April 2018.

OPINION – Jay Ross

Time to Terminate Escalate to Deescalate — It's Escalation Control

"Escalate to de-escalate" is catchy, it rhymes, and it rolls off the tongue. Unfortunately, it is also wrong — but not for the reasons experts usually focus on. Since Russia released its 2014 National Defense Strategy, and especially after the publication of America's 2018 Nuclear Posture Review, U.S. officials, pundits, and national security wonks have used the phrase either to describe Russia's strategy, or as a launching point to criticize that description. Buzz phrases like "escalate to de-escalate" tend to spread through officialdom where they are misunderstood and misused as quickly as they are shared. The problem with the term is not that Russia doesn't have capacity or plans to use calculated escalation (nuclear or otherwise) to contain or terminate a conflict. It's that such escalation is only one part of a larger strategic approach, and the focus on Moscow's nuclear threshold risks missing the forest for the trees.

The United States, facing non-peer adversaries in post-Cold War conflicts, has been able to dominate opponents at any level of conflict where an adversary is capable. Under this framework of "escalation dominance," careful calculations of thresholds and escalation triggers have been more a matter of preference than necessity for state survival. Russia, on the other hand, has had no such advantage vis-à-vis the West and has instead adopted escalation control.

Russia's approach to conflict is better described as "escalation control," a concept that was a part of the American strategy lexicon until the end of the Cold War. The United States, facing non-peer adversaries in post-Cold War conflicts, has been able to dominate opponents at any level of conflict where an adversary is capable. Under this framework of "escalation dominance," careful calculations of thresholds and escalation triggers have been more a matter of preference than necessity for state survival. Russia, on the other hand, has had no such advantage vis-à-vis the West and has instead adopted escalation control — a strategic approach that relies on carefully calculated, proactive measures to ensure a conflict is contained at lower, more acceptable levels. Through this approach Russia can control the level of conflict escalation, dominating the mechanics and circumstances of escalation rather than dominating conflict levels themselves. De-escalating actions are just one tool in this strategy's larger toolbox.

Russia's strategy should be addressed in whole rather just the part focused on the nuclear end of the conflict spectrum. To truly appreciate Moscow's approach, and the variety of tools available at levels below kinetic conflict, the West needs to dust off its understanding of escalation control. Failing to use the correct framework to understand today's evolved capabilities, and the blurred delineations between military and nonmilitary lines of effort, can lead to miscommunication and, possibly, miscalculation.

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truly appreciate Moscow's approach, and the variety of tools available at levels below kinetic conflict, the West needs to dust off its understanding of escalation control. Failing to use the correct framework to understand today's evolved capabilities, and the blurred delineations between military and nonmilitary lines of effort, can lead to miscommunication and, possibly, miscalculation.

Problems with the Bumper Sticker Version: "Escalate to de-escalate" tends to focus solely on Russia's thresholds for nuclear weapons use, rather than taking a holistic approach to conflict. De-escalatory strikes are essentially an action to deter further aggression — that is, to control escalation – but such actions do not need to take place in the nuclear realm. For instance, Russia "escalated to de-escalate" in 2015 and 2016, when it deployed S-400 and S-300 air defense systems to Syria, against the backdrop of increasing tensions between U.S. and Russian forces operating in close proximity there. As one U.S. official quipped when asked about the intent behind the 2016 S-300 deployments, "Nusra doesn't have an air force do they?"

The United States took note of the possibility Russians might shoot down a U.S. aircraft. The increased risk that both nations would stumble into a conflict forced the Pentagon to avoid sustained unilateral actions against regime forces (limited cruise missile strikes aside) because the potential gains did not justify the risk of direct conflict with Russia. In ZAPAD-2017, another example, tactical nuclear weapons were not incorporated into the exercise scenario, but the exercise nonetheless showed how Russia planned to use overwhelming artillery and rocket fire to change the enemy's cost-benefit analysis. De-escalatory actions don't have to use nuclear weapons.

A second, more dangerous problem is that policymakers (and policy wonks) tend to misinterpret the phrase as meaning Russia has lowered its nuclear threshold. It's easy to mentally reduce "escalate to de-escalate" to simply a strategy of out-escalating the other party, perhaps very early in a conflict, by turning to nuclear weapons more quickly than the United States would. But consider that the United States is able to project combat power to Russia's backyard, a mere 300 miles from Moscow, holding the country at risk of a mass attack of shock and awe. If Russia responded with nuclear strikes in this scenario, U.S. officials may misinterpret the reaction as "escalate to de-escalate" in action. But in fact nuclear use in this case would have been driven by Washington's approach, not Moscow's.

Further, focusing on whether Russia will resort to nuclear use risks overlooking other actions taken intentionally below NATO's escalation thresholds. In 2014, Russia could have virtually guaranteed a decisive military victory over Ukraine by displaying its modern military advancements and dominance, sending multiple divisions across the border, supported by thunderous artillery and heavy bombers. It did not, of course, choosing instead to try and achieve as many of its goals operating at as low a level of conflict as possible, and doing so quickly, to avoid NATO intervention.

Additional spin-off terminology has aggravated the problem. The commander of U.S. Strategic Command recently described Russia's strategy as "escalate to win," but this term is unhelpful as it leaves open the definition of "win" in a given conflict. If winning means achieving strategic goals, then that's just every conflict in

history and is too broad to be useful. If the definition of win becomes flexible, then the possible goals become too varied to pin down in a universal rule. The phrase also doesn't account for examples of Moscow using restraint to keep the conflict below levels that invite reciprocal escalation — which is encompassed by the more holistic and useful term "escalation control."

Another variation is "escalate to survive," mentioned on a recent War on the Rocks podcast on this subject, meaning escalatory actions taken to preserve the existence of the state, or perhaps return to a status quo ante. But again, this term doesn't account for more aggressive actions at lower levels of conflict where the existence of the Russian state is not at immediate risk, such as in Ukraine. By focusing on escalate to de-escalate, escalate to win, or escalate to survive, the West may fail to see what actions Russia might take at lower thresholds — and to understand why it is doing so.

In Ukraine, Russia tried a number of methods — at incremental levels of engagement, rather than at higher levels requiring decisive combat power — to achieve measured success before NATO could interdict and escalate the conflict to a level unacceptable for Moscow.

Escalation Control: A More Useful Term: Escalation control is the concept that best accounts for the range of military and diplomatic actions the Kremlin has taken in recent years. This framework, specifically applied to Russian strategy, outlines a proactive approach to controlling the process of escalation rather than militarily defeating the adversary at any given escalation level. It requires Russia to maintain the initiative in a conflict, an area in which it has excelled. In Ukraine, Russia tried a number of methods — at incremental levels of engagement, rather than at higher levels requiring decisive combat power — to achieve measured success before NATO could interdict and escalate the conflict to a level unacceptable for Moscow.

Generally speaking, Russia has controlled the pace and scale of the conflicts in Syria as well, forcing American-backed forces to react to Russian-backed forces' actions. Since Russia first intervened in Syria in 2015, a number of incidents have raised tensions between Russia and the United States: cruise missile strikes in response to chemical weapon use, harassment and encirclement of At Tanf, and the massively successful U.S. strikes on alleged Russian mercenaries. In each case, Russia has set the tone for what happens next, kept the conflict from escalating beyond its means or desires, and remained on track to have a sustained military presence in the Eastern Mediterranean.

Escalation control also requires a confident understanding of the adversary's escalation thresholds. This was clearly a consideration for the Kremlin in Ukraine, where it consciously chose to incrementally increase direct action in the country's east without escalating to decisive combat power (and probably not because it was deterred by fear of Ukraine's military). Rather, Russia applied and refined its understanding of NATO thresholds for intervention, taking care to avoid inviting conflict. In this way, Western deterrence worked at one level of conflict but failed to some degree at another. Russia's incremental increases were not de-escalatory actions, designed to create shock and compel and adversary to back down. Instead, they were intentionally constrained to avoid NATO intervention thresholds. This is consistent with a model of escalation control, but is not "escalate to de-escalate."

The nuance between "escalate to de-escalate" and a strategy that includes de-escalatory actions in its toolbox might seem like a matter of semantics, a little like knowing the exact size of a boot that is kicking you in the face. But this difference has significant implications for how the United States deals with the Kremlin.

Unfortunately, de-escalatory nuclear strikes — the victim of the "escalate to de-escalate" misnomer — are neither the only nor the most likely level of conflict that the West will see from Russia, as Ukraine and Syria have shown. Escalation control can be applied with any weapon system, including nuclear weapons, and it's not even Russia's idea,

at least not originally. "We may seek to terminate a war on favorable terms using our [remaining] forces as a bargaining weapon-by threatening further attack ... our large reserve of ... firepower would give an enemy an incentive to avoid our cities and to stop a war." This might seem like a quote from a Russian Military Thought article, but in fact it was U.S. Secretary of Defense Robert McNamara in 1962 explaining U.S. strategy to use limited nuclear strikes to de-escalate a conflict using "deliberate escalation," specifically in a situation where NATO non-nuclear forces could not successfully defend against a Soviet attack. What was old is new again.

Russians don't believe they can control escalation. Often focus on the higher ends of the conflict spectrum, in this case on nuclear first use thresholds, where the stakes are higher and there are fewer rungs left to climb on the escalation ladder. But at lower levels, the Kremlin has in fact successfully controlled conflict escalation in two theaters with the potential for U.S./ NATO intervention in the last four years.

Whether de-escalation actions take the form of deploying advanced air defense where U.S. aircraft are operating or launching a demonstrative nuclear strike, they achieve their desired aim not through the actual effect of the weapon, but by increasing the risk of what could come next. Deterring further escalation through these actions only works if the possible consequences are both credible and undesirable, which is why it can work at many levels of conflict. Escalation control proactively uses that risk to keep more capable adversaries deterred at lower levels of conflict.

Russia is relying provocative, lower-level actions that use escalation risk to deter United States and avoid getting into a conflict it doesn't want. This approach does have a weakness: It relies on a reactive adversary with known or accurately predicted thresholds. The United States has to decide which escalation thresholds it wants to communicate clearly, and which ones it wants to keep ambiguous to deter Russia.

Critics of escalation control often point out that escalation is not something that a party does, but rather is something that happens, and therefore no party to a conflict can actually control escalation. Indeed, some critics make the case that Russians don't believe they can control escalation. Often focus on the higher ends of the conflict spectrum, in this case on nuclear first use thresholds, where the stakes are higher and there are fewer rungs left to climb on the escalation ladder. But at lower levels, the Kremlin has in fact successfully controlled conflict escalation in two theaters with the potential for U.S./NATO intervention in the last four years.

Moreover, Russia's approach takes full advantage of this fear that escalation is uncontrollable. If an adversary believes that no one can control escalation, increasing the risk of a larger-scale conflict at lower levels can deter even lower-level intervention. Uncertainty increases risk, and the shared risk of escalation into a direct large-scale war can deter lower level confrontation. Through proactive and calculated escalatory actions, Russia can use the risk and uncertainty of potential escalation to enhance its deterrence of adversaries at these lower levels of conflict.

No matter the interpretation, escalation control is a more difficult strategy to counter than just "escalate to deescalate." It can work for many desired outcomes, whether it's to win, simply not lose, maintain a frozen conflict, or solidify a new status quo. It relies on forward-looking detailed planning focused on a limited number of adversaries. It is flexible and responsive to emerging and dynamic situations.

Russia is relying provocative, lower-level actions that use escalation risk to deter United States and avoid getting into a conflict it doesn't want. This approach does have a weakness: It relies on a reactive adversary with known or accurately predicted thresholds. The United States has to decide which escalation thresholds it wants to communicate clearly, and which ones it wants to keep ambiguous to deter Russia. This will be complex, since it requires accounting for newer

domains and means of conflict. It will also require making some tough internal calls about what is important enough to the United States to justify certain actions and certain risks, and then deciding how or whether to communicate those thresholds. Communicating to Russia that any malign act will result in direct military action is not credible. The lines need to be drawn, at least internally, and then the United States needs to decide whether those thresholds are best served by communicating clarity or ambiguity to Russia.

It's true that this intentional ambiguity about escalation thresholds will also create an environment for miscommunication while both sides adjust to their opponents' thresholds and posturing. But if Russia and the United States are going to have miscommunication it should happen at the lowest levels of conflict possible, rather than one party getting backed into a corner where large-scale retaliation is required. If the United States doesn't think through its policy and posturing before a crisis occurs, it may feel compelled to act, to do something, rather than capitulate. Foresight and clarity about Russia's approach to controlling escalation can give the United States hard choices early rather than impossible choices later — and that starts with finding the right language to describe and understand Russia's strategy.

Source: Jay Ross is an associate with Booz Allen Hamilton supporting the Department of Defense, and a U.S. Army Reserve Nuclear Weapons Officer, https://warontherocks.com, 24 April 2018.

NUCLEAR STRATEGY

PAKISTAN

Pakistan may Soon have World's Third Largest Nuclear Stockpile, Claims Expert

Pakistan is well on its way to amassing the world's third largest nuclear weapons stockpile and its decision to deploy low-yield (5 to 10 kiloton) battlefield weapons, represents a dangerous new strategy that could have a telling impact on South Asia's future stability, claims a military history and world affairs expert.

In an article written for the www.military.com website, Joseph V. Micallef, a best-selling military history and world affairs author and a keynote speaker, warns that if Islamabad continues in this vein, there is every possibility of nuclear device or devices falling into the hands of militant jihadist organisations, both in Pakistan and in other parts of the world.

In his article, Micallef says, "Pakistan's past ties to militant jihadist groups like the Afghan Taliban, Tehreek-e-Jihad Islami, Jaish-e-Muhammad, Lashkar-e-Taiba or Hizbul Mujahideen, to name a few, and the emergence of al-Qaida affiliated Ansar Ghawzat-Ul-Hind, have added an additional element of conflict into Indian-Pakistani relations." "They have also led to a significant deterioration" in bilateral ties between Pakistan and the United States, he adds.

Conflict between Pakistan and India must be seen in a larger context, i.e., expanded to a "larger rivalry between China and India in Asia and the Indian Ocean basin." "The military intervention by the United States and its allies to defeat the Taliban in Afghanistan, and the role of both India and Pakistan in that conflict, have added a further layer of complexity between the two countries.

He says this conflict between Pakistan and India must be seen in a larger context, i.e., expanded to a "larger rivalry between China and India in Asia and the Indian Ocean basin." "The military intervention by the United States and its allies to defeat the Taliban in Afghanistan, and the role of both India and Pakistan in that conflict, have added a further layer of complexity between the two countries" Micallef maintains.

Micallef suggests that what concerns him most is that Pakistan continues to engage in a nuclear arms build-up, which it has been doing clandestinely and illicitly for the past 48 years, and that these arms could be accessed by rogue elements, both in Pakistan and abroad. Between 1971 and 2016, Islamabad has been developing its own nuclear arsenal, "both plutonium and enriched uranium-based weapons." Micallef assesses that Pakistan reportedly has four plutonium production reactors and three plutonium reprocessing plants. Pakistan is also

producing HEU, using gas centrifuge enriched uranium.

"The specially designed centrifuges spin uranium hexafluoride gas at high speeds to increase the concentration of the uranium 235 isotope. This is the same technology that Iran had been using in its nuclear weapons program," Micallef states.... According to unconfirmed media reports, as recently as 2014, the Islamic State reached out to former members of the Khan network for assistance in securing atomic weaponry," he says. "While the design and construction of a nuclear device is very likely beyond the capabilities of al-Qaida, IS or any other militant jihadist group, the use of radiological dispersal devices, so called dirty bombs, is well within their capability," he cautions. He also makes a worrying mention of China's considerable help to Pakistan in supplying "a broad array of missile and nuclear weapons related assistance."

Pakistan currently has between 140 and 150 nuclear weapons in its control, but has, it is believed, produced and stockpiled around 3,000 to 4,000 kilograms (6,600 to 8,800 lbs) of weapons grade HEU and about 200 to 300 kilograms (440 to 660 lbs) of plutonium."The current stockpile is enough for an additional 200 to 250 weapons, depending on the warhead's desired yield. As of the end of 2017, Pakistan has enough HEU and plutonium to produce an additional 230 to 290 warheads.

Micallef, cites various intelligence sources to say that Pakistan currently has between 140 and 150 nuclear weapons in its control, but has, it is believed, produced and stockpiled around 3,000 to 4,000 kilograms (6,600 to 8,800 lbs) of weapons grade HEU and about 200 to 300 kilograms (440 to 660 lbs) of plutonium.

"The current stockpile is enough for an additional 200 to 250 weapons, depending on the warhead's desired yield. As of the end of 2017, Pakistan has enough HEU and plutonium to produce an additional 230 to 290 warheads. This number could be higher if Pakistan opts for smaller warheads intended for battlefield weapons. This would raise the Pakistani nuclear arsenal to between 350 and 450 nuclear warheads. Pakistan is adding enough HEU and plutonium to its stockpile to produce around 10 to 20 additional bombs a year."

Micallef mentions that since the late 1980s, Pakistan has used a variety of militant organisations as proxies in its ongoing struggle with India over Kashmir and elsewhere. He certifies that the Pakistan Army's ISI sponsors, organises, trains and funds terror outfits operating from its soil such as the Lashkar-e-Taiba, al-Qaida, Lashkar-e-Omar, Jaish-e-Mohammed, Sipah-e-Sahaba, the Jammu Kashmir Liberation Front (JKLF), Jamaat-ud-Da'wah, Harkat-ud-Jihad al-Islami, the Haqqani Network, Jamaat-ud-Mujahideen Bangladesh (JMB) and the Afghan Taliban, and uses them as proxies for its covert military operations.

According to Micallef, since 1990, Pakistan's military strategy has followed a three-fold approach (1) use militant proxy organizations to strike at Indian military positions in Kashmir (2) rely on the threat to deploy nuclear weapons should India try to retaliate with a military invasion of Pakistan and (3) rely on the U.S. and China, in particular, and world opinion in general, to restrain India from attacking Pakistan.

He says that the Indian Army has come up with a comprehensively developed "Cold Start," Doctrine to make its offensive capabilities more aggressive, while the Pakistani response has been to emphasize the development of so called "theater nuclear weapons" to be in a position to meet the challenge of India's rapid deployment forces with a series of limited nuclear strikes and then rely on international pressure to restrain India from escalating the confrontation into a full blown nuclear conflict.

Micallef says it is important to note that Pakistan's nuclear weapons are kept disassembled at separate facilities, which technically prevents a terrorist organisation from obtaining a functional

nuclear weapon. "The combination of a multi-branch command authority and the fact that the weapons are kept in a disassembled state makes it extremely difficult for rogue elements within Pakistan or for militant organizations to secure, divert or launch a nuclear weapon," he adds.

The future direction of Pakistan's nuclear weapons policy is going to be a function of the state of Indian-Pakistan relations on the subcontinent. In turn, this will be shaped both by the state of U.S.-Pakistan relations over the ongoing conflict with the Taliban in Afghanistan, as well as the broader challenge to India of China's ambitions in Central Asia and the Indian Ocean Basin.

"Battlefield weapons, on the other hand, by their very nature, are more at risk for theft, diversion or unauthorized use," because while they are under the control of the national command authority, their actual use is left to the commander in the field. He concludes by saying, "the future direction of Pakistan's nuclear weapons policy is going to be a function of the state of Indian-Pakistan relations on the subcontinent. In turn, this will be shaped both by the state of U.S.-Pakistan relations over the ongoing conflict with the Taliban in Afghanistan, as well as the broader challenge to India of China's ambitions in Central Asia and the Indian Ocean Basin."

Source: http://www.newindian express.com/, 25 April 2018.

BALLISTIC MISSILE DEFENCE

USA

Pentagon Awards $67.8M Contract for Ballistic Missile Defense System

MacAulay-Brown Inc. has been awarded a contract by the Missile Defense Agency for development and services to support the Ballistic Missile Defense System. The deal, announced by the Department of Defense, is valued at more than $67.8 million under a competitive cost-plus-fixed-fee level of effort contract.

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The contract enables to MacAulay-Brown Inc., out of Dayton, Ohio, to provide "agency advisory and analytical support in support of technical, engineering, advisory and management support," according to the Defense Department. The Pentagon said the contract supports development and deployment of the Ballistic Missile Defense System. Work on the contract will occur in multiple locations across the United States and is expected to be complete by April 2023. More than $1.4 million will be obligated to MacAulay-Brown Inc. at time of award from fiscal 2018 research, development, test and evaluation funds, said the press release.

Source: https://www.upi.com/, 19 April 2018.

NUCLEAR ENERGY

INDIA

US Backs Westinghouse, Says it's Ready to Finish Nuclear Power Projects in India

Westinghouse Electric, which filed for bankruptcy last year, is now "lean and mean and ready to get to work" on its projects to build nuclear reactors in India, U.S. energy secretary Rick Perry confirms. The show of support by Perry came after Pittsburgh-based Westinghouse's bankruptcy filing had raised doubts about the proposed construction of six nuclear reactors in India's Andhra Pradesh state.

The agreement to build reactors, announced in 2016, was the result of a U.S.-India civil nuclear agreement signed in 2008. "Nobody in the world makes better reactors than Westinghouse," Perry told journalists after a meeting with India's oil and gas minister Dharmendra Pradhan in New Delhi. "They had some challenges in the past from

its business practices. We leave that where it is. The bottom line is, that's all behind them. They are lean and mean and ready to get to the work."

Source: https://economictimes.indiatimes.com, 17 April 2018.

GENERAL

Nuclear Growth on Track for Harmony

Nuclear growth is at a 25-year high driven by the need for clean and reliable electricity, World Nuclear Association Director General Agneta Rising told the World Nuclear Fuel Cycle conference held in Madrid. While market problems persist in the USA, China's rate of nuclear approvals is picking up, other keynote speakers said.

The Association's Harmony initiative aims for nuclear energy to provide 25% of world electricity generation by 2050 as part of a diverse mix of low-carbon generating technologies to avoid the most damaging consequences of climate change, based on the International Energy Agency's "two-degree" scenario.

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The 25 years to 2014 saw the start-up of an average of five nuclear reactors per year, Rising said. The period 2015-2017 saw an average of ten reactors per year, while 14 new reactors are expected to start up this year. The Harmony goal is achievable, Rising said, but more new construction starts are needed. The next two years will see 33 GWe of nuclear capacity added to the grid: 30 reactors, in ten countries, including two newcomer countries, she said.

However, some reactors face challenging conditions in deregulated markets that are not favourable towards nuclear energy, or indeed to any large investment, Rising said, highlighting recent announcements of reactor closures in the USA. Such reactors are not failing power plants, but are operating in failing markets, she said."If they don't value the environmental benefits, if they don't value the economical benefits to society, and only look at the cost and the price, some reactors will close .... We have to work to see that the value we bring to society receives full recognition."

NEI's Four Pillars: Dan Lipman, vice president of supplier and international programmes at the Nuclear Energy Institute (NEI), described the current US situation as a "tale of two cities". US nuclear power plants last year enjoyed an excellent safety record, provided two-thirds of the USA's clean energy, and operated at capacity factors of over 90%. However there is low growth - if any at all - in US electricity demand, and a surge in low-cost shale gas. Fuel diversity is being taken for granted and undervalued, while state and federal mandates and subsidies for renewables distort markets, he said. Roughly half of US nuclear plants operate in regulated markets, where electricity prices are set by state authorities, but the remainder - those that operate in competitive markets - do not, and are affected by market design issues which fail to recognise valuable nuclear attributes and suppress prices.

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With 4674 MWe of US nuclear capacity already closed since 2013 and over 11,000 MWe potentially facing premature closure in 2018-2025

for policy or market reasons, federal and state policymakers and grid operators face the choice of continuing to focus on short-term prices or considering the broader issues of a resilient, robust electricity system, clean air, health, jobs, tax revenues and other benefits, he said.

NEI is calling for a national nuclear strategy built on four pillars of Preserve, Sustain, Innovate and Thrive, Lipman said: preserving the current operating fleet - including discussions by the Federal Electricity Commission to recognise nuclear's contributions to grid resiliency - and legislative action, particularly at state level, recognising nuclear's attributes; sustain, through measures such as reducing regulatory burdens; supporting innovation, through streamlining the progression from design to commercial operation for new reactor designs, and developments such as accident-tolerant fuel, which can also help to revolutionise cost structure; and ensuring the nuclear industry continues to thrive, through international cooperation.

Following the Fukushima accident in Japan in March 2011, the Chinese government has approved only seven new reactors but six to eight new units are expected to be approved this year. The rate of approvals is still lower than before Fukushima CGN plants under construction include two EPRs, as a joint venture with EDF. Fuel loading began earlier this month (April) at the first of these, Taishan 1, which is expected to be the first EPR in the world to start operations.

China Approvals: CGN is the largest owner and operator of nuclear power plants in China, with 20 units in operation and eight under construction, CGN UK CEO Dongshan Zheng said. This also makes the company the largest builder of new nuclear power plants based on units under construction globally. Following the Fukushima accident in Japan in March 2011, the Chinese government has approved only seven new reactors, he said, but six to eight new units are expected to be approved this year. The rate of approvals is still lower than before Fukushima, he added. CGN plants under construction include two EPRs, as a joint venture with EDF. Fuel loading began earlier this month (April) at the first of these, Taishan 1, which is expected to be the first EPR in the world to start operations.

CGN is also involved in new-build projects in the UK through its GNI subsidiary, which holds 33.5% of the Hinkley Point C project and 20% of the Sizewell C EPR project, as well as 66.5% of the Bradwell B project where a Chinese-designed HPR1000 reactor is envisaged. The company has committed over GBP10 billion (USD13.9 billion) to UK new nuclear and has created the General Nuclear Services joint venture - of which CGN owns 66.5% - to undertake the UK's regulatory generic design assessment (GDA) process for HPR1000.

Zheng said the company also intends to build and develop resources in nuclear and other low-carbon generation in the UK, and to build its reputation as a "major credible long-term industrial player" in that country. CGN has signed over 30 contracts with UK and EU companies over the past 20 months - worth about GBP60 million. "This is just the start - certainly with the development of the Bradwell power [station] we will have more contracts," he said.

Zheng said the company had analysed the possible consequences of Brexit before concluding contracts in 2016. "One thing is certain: the UK needs clean energy, and the UK needs nuclear," he said. "We think the market is there, the policy is there, and for Hinkley Point, already the Contract-for-Difference. We are very confident that the market we are working round has a very good future," he said....

Source: World Nuclear News, 23 April 2018.

NUCLEAR NON-PROLIFERATION

IRAN

'Either All or Nothing' on Iran Nuclear Deal, Warns its Foreign Minister Zarif

The European signatories of Iran's nuclear deal with major powers should convince US President Donald Trump not to exit the accord as there is no"plan B" for the agreement, Iranian Foreign Minister Mohammad Javad Zarif tweeted. "It is either all or nothing. European leaders should

encourage Trump not just to stay in the nuclear deal, but more important to begin implementing his part of the bargain in good faith," Mr Zarif wrote on his Twitter account.

Under Iran's settlement with the United States, France, Germany, Britain, Russia and China, Teheran agreed to curb its nuclear programme to satisfy the powers that it could not be used to develop atomic bombs. In exchange, Iran received relief from sanctions, most of which were lifted in January 2016. Mr Trump has given the European signatories a May 12 deadline to "fix the terrible flaws" of the 2015 nuclear deal, or he will refuse to extend US sanctions relief on Iran.

In an interview French President Emmanuel Macron said, he has no "plan B" for the deal and the United States should stay in the agreement as long as there is no better option. The JCPOA, or Joint Comprehensive Plan of Action, is the formal name of the accord. Iran has said it will stick to the accord as long as the other parties respect it, but will "shred" the deal if Washington pulls out.

China and Russia will block any attempts to "sabotage" the Iran nuclear agreement, Russian Foreign Minister Sergei Lavrov saidS. "There are attempts to interfere with the international order upon which the United Nations depends," Mr Lavrov said after talks with his Chinese counterpart Wang Yi in Beijing. "We said clearly with China that we will stop attempts to sabotage these agreements that were passed in a UN Security Council resolution," Mr Lavrov said.

He was speaking on the eve of a meeting of the Shanghai Cooperation Organisation, a regional security bloc spearheaded by Moscow and Beijing. Calling the Iran agreement "one of the biggest achievements in international diplomacy in recent times", Mr Lavrov said that "revising this document is unacceptable".

Source: https://www.straitstimes.com/, 23 April 2018.

Russia, China to Work Together to Block US Attempt to Sabotage Iran Deal

Russian and Chinese officials have agreed to try and prevent the United States from "sabotaging" the Iran nuclear deal in the face of President Trump's looming deadline to withdraw from the agreement. Russian Foreign Minister Sergei Lavrov said that he and his Chinese counterpart agreed that the two countries would "obstruct attempt to sabotage these agreements which were enshrined in a U.N. Security Council resolution," according to Russian state media.

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"We are against revising these agreements. We consider it very counterproductive to try to reduce to zero years of international work carried out via talks between the six major powers and Iran," Lavrov added. France, the United Kingdom and Germany are among the other nations to sign the deal, which eased sanctions on Iran in exchange for limiting its development of nuclear weapons.

Trump has long criticized the Obama-era agreement, calling it "the worst deal ever negotiated." He has set a May 12 deadline to improve the accord or see the United States effectively withdraw from it. Other foreign leaders have urged the U.S. to remain in the deal.Iranian Foreign Minister Mohammad Javad Zarif ripped Trump, saying he has failed to live up to the nuclear deal.

Source: http://thehill.com/policy/, 23 April 2018.

NUCLEAR PROLIFERATION

NORTH KOREA

DPRK Announces Suspension of Nuclear Testing

Bill Clinton offered oil and reactors. George W. Bush mixed threats and aid. Barack Obama stopped trying after a rocket launch. While Seoul

and Washington welcomed Pyongyang's declaration to suspend further intercontinental ballistic missile tests and shut down its nuclear test site, the past is littered with failure. A decades-long cycle of crises, stalemates and broken promises gave North Korea the room to build up a legitimate arsenal that now includes purported thermonuclear warheads and developmental ICBMs. The North's latest announcement stopped well short of suggesting it has any intention of giving that up....

Seoul has said Kim expressed genuine interest in dealing away his nuclear weapons. But North Korea for decades has been pushing a concept of "denuclearization" that bears no resemblance to the American definition, vowing to pursue nuclear development unless Washington removes its troops from the Korean Peninsula and the nuclear umbrella defending South Korea and Japan.

2018: North Korea's abrupt diplomatic outreach in recent months comes after a flurry of 2017 weapons tests, including the underground detonation of an alleged thermonuclear warhead and three launches of developmental ICBMs designed to strike the U.S. mainland. Inter-Korean dialogue resumed after Kim in his New Year's speech proposed talks with the South to reduce animosities and for the North to participate in February's Winter Olympics in Pyeongchang. North Korea sent hundreds of people to the games, including Kim's sister, who expressed her brother's desire to meet with South Korean President Moon for a summit. South Korean officials later brokered a potential summit between Kim and Trump.

While South Korean and U.S. officials have said Kim is likely trying to save his broken economy from heavy sanctions, some analysts see him as entering the negotiations from a position of strength after having declared his nuclear force as complete in November. Seoul has said Kim expressed genuine interest in dealing away his nuclear weapons. But North Korea for decades has been pushing a concept of "denuclearization" that bears no resemblance to the American definition, vowing to pursue nuclear development unless Washington removes its troops from the Korean Peninsula and the nuclear umbrella defending South Korea and Japan. ...

Source: http://www.flyergroup. com/, 22 April 2018.

JAPAN

Japan Calls on NPT Members to Push N. Korea Further on Nukes

Foreign Minister Taro Kono called on parties to the Nuclear Non-Proliferation Treaty to urge North Korea to go beyond a freeze of nuclear testing and seek a "complete, verifiable and irreversible" end to its nuclear program. "North Korea's nuclear and missile programs pose a grave challenge to the international nuclear non-proliferation regime," Kono said in Geneva during the second preparatory committee meeting for the 2020 NPT review conference. Kono said Japan welcomes North Korea's promise to halt its testing of nuclear weapons and intercontinental ballistic missiles, and to dismantle its main nuclear testing site.

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He said the international community requires North Korea to sign and ratify the Comprehensive Nuclear Test Ban Treaty, or CTBT.... Kono said Japan is calling for the international community to improve the transparency of countries' nuclear forces, establish a more effective verification mechanism for nuclear disarmament and address "hard questions" about "security concerns that may

emerge from the nuclear disarmament process."

Japan expressed fear over a further widening of the gap between the nuclear haves and have-nots to explain why it has refused to take part in a U.N. treaty banning nuclear weapons adopted last year, despite seeking a world free of such weapons. The world's nuclear-armed states and other countries that rely on the U.S. nuclear deterrent also sat out on negotiations for the ban treaty. "A sovereign state must protect the lives and properties of her people. We need to seek security and nuclear disarmament simultaneously," Kono said. He said Japan, as the only country to have sustained wartime nuclear bombings, has a "responsibility to lead international efforts towards the elimination of nuclear weapons...."

Soure: http://theasiatimes.in, 24 April 2018.

US President Donald Trump is expected to decide by May 12, 2018 whether to pull the US out of the nuclear deal reached between Iran and six major world powers in 2015. Trump, however, has said he would not extend the waiver suspending the US sanctions on Iran. The US President has repeatedly criticized the landmark nuclear pact in which the West promised to relieve sanctions on Tehran in exchange for a halt in Iran's efforts to develop a nuclear weapon.

IRAN

Iran Threatens to Quit NPT If US Scraps Nuclear Deal

A senior Iranian security official said that his country would consider withdrawing from the NPT if the US scraps the 2015 nuclear deal, *Tehran Times* reported. "According to the NPT, the (contracting) countries can easily withdraw from the treaty if they realize that it does not benefit them and this is a possible option for the Islamic Republic of Iran," said Ali Shamkhani, secretary of Iran's Supreme National Security Council. Shamkhani made the remarks at a press conference before his departure to Russia's Sochi to attend an international security conference.

Iran has not benefited from the fruits of the nuclear deal, officially known as the JCPOA, which went into effect in January 2016, he said. "The other side (the United States) has been creating obstructions since the day of implementation of the agreement," the Iranian official added He also highlighted Iran's capability of "resuming nuclear activities," saying his country will take "surprising actions" if the nuclear deal is sabotaged. US President Donald Trump is expected to decide by May 12, 2018 whether to pull the US out of the nuclear deal reached between Iran and six major world powers in 2015. Trump, however, has said he would not extend the waiver suspending the US sanctions on Iran. The US President has repeatedly criticized the landmark nuclear pact in which the West promised to relieve sanctions on Tehran in exchange for a halt in Iran's efforts to develop a nuclear weapon.

Source: https://www.financialexpress.com/, 25 April 2018.

NUCLEAR SAFETY

GHANA

Commitment to Safety at Ghanaian Research Reactor

The operator of the Ghana Research Reactor, known as GHARR-1, has shown a high commitment to safety following the conversion of the reactor core to use low-enriched uranium as fuel instead of high-enriched uranium, according to the IAEA. It made a number of recommendations to the Ghana Atomic Energy

Commission (GAEC) to further enhance safety.

GHARR-1 is a low-power research reactor with a maximum thermal power level of 30kW. It is a commercial type of the Miniature Neutron Source Reactor (MNSR) designed, manufactured and constructed by the China Institute of Atomic Energy. Originally fuelled with 90.2% HEU, the reactor is designed for use in universities, hospitals and research institutes, mainly for neutron activation analysis, production of short-lived radioisotopes, education and manpower development. The GHARR-1 reactor - located at the National Nuclear Research Institute of the GAEC - started operations in December 1994. It is primarily used for trace element analysis for industrial and agricultural purposes, research, education and training.

The GHARR-1 was the first of five such MNSR reactors outside of China eligible for conversion and fuel return to China. Under a project involving China and Ghana, as well as the USA and the IAEA, the HEU core was removed from the reactor in August 2016 and a new LEU core installed. This operation was completed in July 2017. The HEU fuel was returned to China the following month.

In 2006, efforts were initiated to convert Chinese-designed MNSRs from HEU to LEU fuel. The GHARR-1 was the first of five such MNSR reactors outside of China eligible for conversion and fuel return to China. Under a project involving China and Ghana, as well as the USA and the IAEA, the HEU core was removed from the reactor in August 2016 and a new LEU core installed. This operation was completed in July 2017. The HEU fuel was returned to China the following month.

An IAEA Integrated Safety Assessment of Research Reactors (INSARR) mission is conducted at the request of an IAEA member state. It is a peer review service that assesses and evaluates the safety of research reactors based on IAEA safety standards. A five-day INSARR mission to assess the safety of the GHARR-1 reactor concluded on 20 April. The four-member team comprised experts from France, Jamaica and the USA, as well as the IAEA. The mission covered organisational and management aspects as well as technical areas including the core conversion, safety assessment, training and qualification of operating personnel, operation and maintenance programmes, radiation protection, and emergency preparedness.

"The research reactor's operator is showing a high commitment to safety and has implemented safety improvements as part of the reactor core conversion," said team leader Deshraju Venkat Rao, nuclear safety officer at the IAEA. "There is a need for further improvements, however, particularly in areas related to organisational measures, safety documentation, and operational safety, including radiation protection aspects." The mission team made recommendations to the GAEC for further improving safety at GHARR-1. These include completing the revision of reactor safety and operating documentation to reflect the results of the commissioning of the reactor following the fuel conversion. It also recommended GAEC enhance the training and qualification programme for operational personnel. The team said GAEC should also improve the capability for monitoring operational safety parameters under all conditions, as well as strengthening radiation protection....

Source: World Nuclear News, 24 April 2018.

NUCLEAR WASTE MANAGEMENT

CANNADA

Canada Mishandling Nuclear Waste Plans Warn First Nations, Environmental Proups

First Nations leaders say they have not been properly consulted about the prospect of a nuclear waste disposal site being established northwest of Ottawa near a prominent nuclear research centre. Glen Hare, deputy grand chief of the Anishinabek Nation, says his people were not consulted about the proposed Chalk River dump site, which is located less than a kilometre from the Ottawa River. "We cannot have open season

to bury nuclear waste on our lands," Hare told in a news conference. "The repercussions of it are too deadly. This is something we do not want to leave for our kids in the future."

Indigenous groups and environmentalists have opposed the planned disposal site at the Chalk River facility, about two hours northwest of Ottawa, since it was first announced by Canadian Nuclear Laboratories in 2017. The proposal for an above-ground landfill holding some 1 million cubic metres of waste has raised concerns that nearby water sources could be contaminated.

The Canadian Nuclear Safety Commission is currently conducting an environmental assessment of the project – the final step in the approval process aside from public hearings, which can be in 2019. "This doesn't go back to cabinet. The only way this would ever go back to the federal cabinet is if CNSC deems that there is significant adverse environmental effects" said Patrick Nadeau, executive director of Ottawa Riverkeeper. "We always like to point out that in CNSC's history, they've never said no."

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A group of 40 environmental groups and five Ontario First Nations is calling on the IAEA today to investigate Canada's nuclear waste management practices.

Representatives from local environmental advocacy groups say two other proposals for permanent radioactive waste disposal – one in Manitoba and another in Ontario – contradict the agency's guidelines. Those proposals involve a method known as "entombment," in which the existing systems and structures are encased in grout. Both proposals are also in the environmental assessment phase.

Capping radioactive waste with materials like concrete or grout raises concerns of nuclear leakage, said Jones, adding that such materials might not possess the necessary longevity to contain the toxins. "They try and make the case that it will last a few thousand years, but they can't guarantee that," she said."And even if it did last for 1,000 years, it's not long enough because the wastes are going to be hazardous for a 100,000 years…."

Source: https://www.ctvnews.ca/, 23 April 2018.

Centre for Air Power Studies

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

Centre for Air Power Studies
P-284
Arjan Path, Subroto Park,
New Delhi - 110010
Tel.: +91 - 11 - 25699131/32
Fax: +91 - 11 - 25682533
Email: capsnetdroff@gmail.com
Website: www.capsindia.org

Edited by: Director General, CAPS

Editorial Team: Dr. Sitakanta Mishra, Hina Pandey, Anushree Dutta, Dr. Poonam Mann, Wg Cmdr Kaura, Dr Pamreihor Khashimwo

Composed by: CAPS