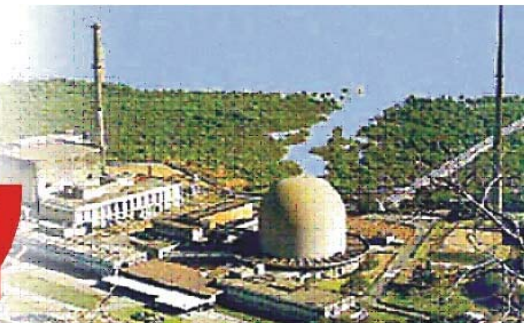
NUCLEAR SECURITY



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

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OPINION – Rakesh Sood

Beyond JCPOA – Non-proliferation Regimes

President Donald Trump's dislike for the JCPOA — as presidential candidate he had promised to "rip up" the deal in his first day in office — is not because Iran has been cheating on its obligations; on the contrary, since 2015, the IAEA has provided ten periodic reports certifying Iran's compliance. Trump's criticism is that the JCPOA is not good enough — he would like the nuclear restraints on Iran to be permanent rather than for only 10 to 15 years as provided under the JCPOA; Iran's ballistic missile programme to be curtailed; and its regional involvement including in wars in Syria and Yemen ended. His argument is that the sanctions relief has provided Iran with USD 100 billion that can be used "as a slush fund for weapons, terror and oppression" in the region.

Pre-JCPOA sanctions are being reimposed over the next three to six months which will restrict Iranian oil exports, Iran's ability to trade using the US dollar, and impose sanctions on companies dealing with Iran by blocking their assets and activities in the US. Trump's decision has been widely criticised by most countries with the exception of Israel and Saudi Arabia. Iranian President Hassan Rouhani has said that unless the deal can be salvaged by the other partners (France, Germany, UK, EU, China and Russia), Iran will resume its nuclear enrichment programme.

So far, diplomatic negotiations have only produced expressions of political support for the JCPOA. Considering that Trump's decision is a unilateral violation of UN Security Council Resolution 2231 adopted by consensus, the fact that none of the other P-5 members have raised it in the Security Council reflects the internal divisions and the limits to a coordinated response.

So far, diplomatic negotiations have only produced expressions of political support for the JCPOA. Considering that Trump's decision is a unilateral violation of UN Security Council Resolution 2231 adopted by consensus, the fact that none of the other P-5 members have raised it in the Security Council reflects the internal divisions and the limits to a coordinated response. Major European companies like Total and Airbus have already announced reviews of investments that were made under the deal.

The problem is that the US has not offered any alternatives to deal with Iran's nuclear programme, the original reason that led to the JCPOA to begin with. Iran is a non-nuclear weapon state, party to the NPT subject to full-scope safeguards. It has consistently maintained that its programme is peaceful as it considers nuclear weapons 'haram' and un-Islamic. However, it seeks to develop aspects of nuclear technology, including for power generation, enrichment and reprocessing technologies, subject to IAEA safeguards. Suspicions about Iranian activities including setting up of undisclosed facilities led to the assessment that Iran would soon be able to accumulate (possibly within three months) enough highly enriched uranium to produce one nuclear device.

NPT is the cornerstone of the global non-proliferation regime but its internal inconsistencies are becoming increasingly visible. In terms of its non-proliferation objectives, it has reached the limits of its success. Only three countries have never joined it (India, Israel and Pakistan) and one country has withdrawn from it (North Korea). However, on the disarmament front, the NPT has failed to even begin a negotiation as mandated by Art VI.

The JCPOA froze all such activities for 10 to 15 years and imposed additional verification measures beyond full-scope safeguards in return for sanctions relief. It made Iran move from being the most sanctioned country to one whose nuclear programme was subjected to the most rigorous inspection regime. Under current circumstances, since sanctions relief will end, pressures will mount in Iran to terminate its onerous verification obligations. Some hardliners have even called for Iran to withdraw from the NPT.

NPT is the cornerstone of the global non-proliferation regime but its internal inconsistencies are becoming increasingly visible. In terms of its non-proliferation objectives, it has reached the limits of its success. Only three countries have never joined it (India, Israel and Pakistan) and one country has withdrawn from it (North Korea). However, on the disarmament front, the NPT has failed to even begin a negotiation as mandated by Art VI. This growing frustration led more than 120 countries, all parties to the NPT, to conclude a Nuclear Ban Treaty in 2017.

More significant is the fact that since the NPT was negotiated 50 years ago, nuclear technology has matured. To control its spread, major powers have used informal mechanisms like export control regimes to restrict access to nuclear materials and dual-use materials and technologies by hyping up the proliferation threat. More relevant is the fact that during the last decade, major powers have embarked on a process of nuclear modernisation. New reviews indicate that new roles and doctrines for more usable nuclear weapons are being developed. With growing divergences among major powers, the prospects for arms control have disappeared.

At the heart of the NPT is an inconsistency: it delegitimises proliferation but legitimises nuclear weapons in the hands of five countries. As long as there was convergence among major powers, the inconsistency could be covered but growing divergences and evolving technology make it difficult. The US' exit from JCPOA may just be the last straw that breaks the camel's back.

In addition, there are regional issues as well. If Iran recommences enrichment, Saudi Arabia has said that it will seek the same rights from the US, too. The possibility becomes real of Pakistan giving a helping hand in return for Saudi largesse (past and ongoing) especially if the US is willing to turn a blind eye to it (as it did when China proliferated nuclear and missile technologies to Pakistan).

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Source: https://www. orfonline. org, 20 July 2018.

OPINION – Robert F. Dodge

Nuclear Non-Proliferation Treaty at 50 – Awaiting Good Faith

Fifty years ago on July 1, 1968 the NPT was signed. This landmark nuclear arms control treaty brought the world's nuclear powers together with the ultimate goal of eliminating nuclear weapons by engaging in good faith efforts toward that end.

Unfortunately, there was no enforcement mechanism. The Treaty also had a "grand bargain" that allowed nations to pursue the "peaceful" use of the atom for nuclear power, medical and scientific research. This bargain resulted in the continued proliferation and development of nuclear weapons programs in North Korea, India, Pakistan and Israel – each of whom went on to develop their own nuclear arsenals, and Iran pursued a nuclear program that was halted by the Iranian nuclear deal, now in jeopardy due to Trump's unilateral withdrawal.

A new arms race is under way in direct violation of the intent of the Treaty. There continue to exist approximately 14,455 warheads as of early 2018. As part of the Treaty a review process was put in place every five years. The NPT treaty was signed into perpetuity in 1995 having been in force for 25 years.

Ignoring the good faith Article VI of the NPT Treaty, which mandates that the nuclear weapons states dismantle theirs, the US/Russian arms race continued, almost doubling, until the ultimate passage of the Start I Treaty in 1991 after a decade of negotiations. The reductions in nuclear arsenals continued thereafter until the past decade where they have slowed dramatically.

Now it's reversed; a new arms race is under way in direct violation of the intent of the Treaty. There continue to exist approximately 14,455 warheads as of early 2018. As part of the Treaty a review process was put in place every five years. The NPT treaty was signed into perpetuity in 1995 having been in force for 25 years.

The following year in 1996, climate scientist Alan Robock and atmospheric and oceanic studies professor Brian Toon and their colleagues presented scientific data on the atmospheric and climatic effects of a limited regional nuclear war between India and Pakistan using half of their arsenals representing less than one-half percent of the global nuclear arsenals.

It was estimated this limited nuclear war would drop surface temperature 1.3 degrees Celsius across the planet. The effects on the central agricultural growing regions of the major continents would be far greater resulting in a significant shortening of growing seasons.

Subsequent studies on global food production by Physicians for Social Responsibility (PSR) and its international affiliate, The International Physicians for the Prevention of Nuclear War (IPPNW) identified that more than two billion people would be at mortal risk from "nuclear famine" as a result of this catastrophic climate change.

This science was beginning to become clear at the 2010 NPT Review Conference. At that conference, the ICAN, launched by IPPNW in 2007, recognizing the humanitarian consequences of nuclear war and the inertia by the nuclear arms states to move toward nuclear abolition in earnest, pushed for a nuclear weapons convention that would ban nuclear weapons just as every other weapon of mass destruction had been banned before.

From that point forward ICAN helped to spearhead and coordinate the efforts of the non-nuclear nations, civil society and international NGO community in a focused movement to educate on the humanitarian consequences of nuclear war and to develop the political will for a treaty on the prohibition of nuclear weapons.

Three international meetings followed. These occurred in Oslo, Norway in March 2013 with 130 nations represented. Subsequently a meeting was held in Nayarit, Mexico in February 2014 with 146 nations represented, with a third meeting in Vienna, Austria in December 2014 with 158 nations represented. Out of this arose the humanitarian pledge to work toward the complete abolition of nuclear weapons.

This laser-focused effort ultimately resulted in last summer's Treaty on the Prohibition of Nuclear Weapons (TPNW) signed by 122 nations. This new treaty prohibits nations from developing, testing, producing, manufacturing, transferring, possessing, stockpiling, using or threatening to use nuclear weapons, or allowing nuclear weapons to be stationed on their territory.

Presently, 58 nations have signed the treaty with 10 nations ratifying it. Once ratified by 50 nations the treaty will enter into force. ICAN is now focusing its work on lobbying the necessary nations for Treaty ratification. Once ratified the TPNW will fill the legal gap in the NPT Treaty necessary to abolish nuclear weapons.

Presently, 58 nations have signed the treaty with 10 nations ratifying it. Once ratified by 50 nations the treaty will enter into force. ICAN is now focusing its work on lobbying the necessary nations for Treaty ratification. Once ratified the TPNW will fill the legal gap in the NPT Treaty necessary to abolish nuclear weapons. In addition to the work of ICAN, there is much that is going on in the United States and around the world to abolish these weapons and prevent their use either by intent, miscalculation or accident.

A rapidly growing coalition of cities, organizations and individuals has supported a call to prevent nuclear war and move back from the brink. More than 150 organizations have endorsed this "Back From The Brink" call upon the United States to lead a global effort to prevent nuclear war by, 1. Renouncing the option of using nuclear weapons first, 2. Ending the sole unchecked authority of any U.S. president to launch a nuclear attack, 3. Taking US nuclear weapons off hair trigger alert, 4. Canceling the plan to replace its entire nuclear arsenal with "enhanced" nuclear weapons and, 5. Endorsing the Treaty on the Prohibition of Nuclear Weapons while actively pursuing a verifiable agreement among nuclear arms states to eliminate their nuclear arsenals.

In addition, financial divestment of nuclear weapons is an important piece toward the elimination of these weapons and stigmatizing those companies that manufacture and/or fund their production. An international campaign that is coordinating this effort is at "Don't Bank on the Bomb" and can be used by anyone to investigate whether they are unknowingly complicit in the continued existence of nuclear weapons. The NPT will ultimately only be successful when leaders have the political will for change or potentially by the unpredictable impulses of leaders. As the US and Russia hold their "great" summit in July, it is the people of the world held hostage by these weapons who must demand their abolition.

Source: https://www.postindependent.com, 06 July 2018.

OPINION – Wayne McLean

Watchful Turkey May Go Nuclear Soon

Actors not invested in the Western liberal order are enjoying a period of resurgence. While analysts chase meaning in US President Donald Trump's many erratic policies, there are some threads of consistency, including his affection for strongmen and his scepticism about the existing economic and security orders.

Until recently, nuclear aspirants were more likely to end up on the gallows (Saddam Hussein) or bayoneted in ditches (Muammar Gaddafi). Yet in 2018, Kim has used his nuclear capability to obtain a degree of legitimacy in exchange for few concessions or concrete commitments. This reintroduction of nuclear weapons as a legitimate security currency emboldens potential proliferators.

Whether this is by design or incompetence is debatable, but it has incentivised a range of once off-limits security policies particularly of interest to those with a dictatorial bent. The policy with the most profound long-term implications is Trump's embrace of North Korean leader Kim Jong Un, who has effectively been rewarded for his family's nuclear ambitions.

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bayoneted in ditches (Muammar Gaddafi). Yet in 2018, Kim has used his nuclear capability to obtain a degree of legitimacy in exchange for few concessions or concrete commitments. This reintroduction of nuclear weapons as a legitimate security currency emboldens potential proliferators, presenting a challenge to one of the key norms of international politics. Turkey is one of many actors who will be watching carefully. There are strong incentives for a nuclear pathway given Turkey's vulnerabilities and strategic position.

***Turkey Turns Away From the West*:** Turkey has historically eschewed a nuclear programme because it already housed nuclear weapons: The US has stationed missiles there since 1959. As part of NATO agreements, an estimated 50 "B61" nuclear bombs still remain on Turkish soil at Incirlik Air Base, in the country's south, as a deterrence measure. But Trump's disdain for NATO threatens this arrangement. In fact, a 2015 Carnegie paper assessing Turkey's nuclear posture argued that the most probable scenario under which Turkey would seek nuclear weapons would be a collapse of its relationships with NATO and the US.

A variety of actors have an interest in Turkey losing its proxy nuclear deterrent. Russia has embraced Ankara as a defence partner, selling it the S-400 air defence missile shield which hedges against total NATO dependence. Both Iran and Syria would welcome the removal of nuclear weapons from Incirlik, as it would reduce the US security presence in the region.

There are signs that Turkey has contingency plans for the removal of weapons too, demonstrated by their pursuit of nuclear latency: The material and technical capabilities to produce weapons within a short time frame should the need should arise.

A first piece of evidence is Turkey's consistent pursuit of nuclear energy, which would enable the establishment of a fuel cycle to manufacture weapons. Ankara first began pursuing nuclear power in the 1970s, but these efforts were disbanded after Pakistan's controversial nuclear test in 1998. Turkey then held concerns that any nuclear activity might be problematic for their attempts to join the EU following widespread criticism of Islamabad. This reticence has changed in the current international environment.

***Aspirations For Proliferation*:** Work recently commenced on the Akkuyu nuclear station on the Mediterranean Coast. The station interests strategic analysts for a variety of reasons: It has a quick build time – five years compared to the International Atomic Energy Agency – recommended 10–15 years; and it will be the first nuclear station ever built under a BOO (Buy Own Operate) model.

The contractor is the Russian company Rosatom, and operations, ownership of processes, and inspection regimes are legislatively unclear under the BOO model. The second piece of evidence is the increasing speed of Turkey's indigenous ballistic missile programme and associated defence products. The first fully indigenous missile was demonstrated in April 2017. Its development coincided with an increase of 39 per cent in domestic defence development from 2016 to 2017.

Others have highlighted Ankara's thinly veiled aspirations to proliferate, but assert Turkey lacks material capabilities and that claims should be viewed in a domestic context. For example, former parliamentarian Aykan Erdemir has argued that "Erdogan has a strong desire to make Turkey into a nuclear power, but not the capacity," and that the "pro–government media often exaggerate the strength of the military to increase morale in Turkey".

Nuclear expert Mark Hibbs cited a deficit of necessary technology as well as the safeguards put in place by the IAEA, which has found no

evidence of clandestine or undeclared nuclear activities during its reporting processes. But while Hibbs's points are strongly made, his analysis predated Trump's election. The contrast between the international political climate of 2015 and the present is hard to understate.

Will Turkey Emerge As Nuclear State? In 2018, NATO looks fractured and the Western normative order is potentially in decline. Russia is revitalised and assertive. In the nuclear domain, Iran appears to have engaged with the UN Security Council's five permanent members and Germany and the Joint Comprehensive Plan of Action only to be punished, while serial offender Kim has been rewarded for his determined push towards proliferation.

In this context, the proliferation threshold has been lowered and the oft-discussed nuclear "domino effect" becomes more likely. The most widely discussed possibility is a single Middle Eastern state proliferating, and others quickly following, the most likely candidates being Iran, Saudi Arabia, UAE, Egypt and Turkey.

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The internal characteristics of the Turkish state are also more conducive to proliferation. President Recep Tayyip Erdogan can effectively rule by decree under new powers granted after the 2017 referendum and his 2018 re-election. Importantly, the 2016 coup attempt allowed him to purge the military and defence establishment of dissenting actors who could push back against dramatic strategic changes.

When combined, the new highly centralised political system, future access to a nuclear fuel cycle, large investment in delivery mechanisms, and an international system where proliferation is rewarded make Turkey's emergence as a nuclear state much more likely than in the past. Given international security is largely a game of deterrents, it is hard to picture a strategic environment where Turkey is not considering or planning the ability to proliferate in the near future if required.

When combined, the new highly centralised political system, future access to a nuclear fuel cycle, large investment in delivery mechanisms, and an international system where proliferation is rewarded make Turkey's emergence as a nuclear state much more likely than in the past. Given international security is largely a game of deterrents, it is hard to picture a strategic environment where Turkey is not considering or planning the ability to proliferate in the near future if required.

Source: https://www.channelnewsasia.com, 23 July 2018.

OPINION – Malcolm Davis

If the US Nuclear Umbrella Folds … The Choices for Australia

Rod Lyon's thought-provoking article in *The Strategist* concludes with a sobering choice for Australian defence planners considering a post–San Francisco world without US extended nuclear deterrence, and suggests two basic choices for Australia, Japan and South Korea: "They can either head down the path of developing indigenous nuclear arsenals, or they can attempt to dilute the advantages that nuclear weapons confer—advantages which would otherwise accrue to a set of states that did not wish them well."

Both Japan and South Korea have the technological means to rapidly develop independent nuclear deterrent capabilities, though neither state would have strong popular support for such a move. For Australia, it's a bit more complicated. The issue of Australia 'going nuclear' has already been considered in numerous articles, and 2018 began with a bang in The Strategist with a discussion on

Australia's nuclear options by key authors such as Hugh White, Andrew Davies and Stephan Frueling, and in an ASPI Strategic Insights report by Paul Dibb and Richard Brabin-Smith. I contributed my thoughts, too.

The complexity and cost of getting the warheads and acquiring a credible delivery system would probably push Australian defence spending well past the 2% GDP target that we currently aspire to. Maybe President Donald Trump's proposed 4% GDP target for NATO would be more appropriate as a starting point for an Australia considering nuclear weapons. There would be political consequences for Australia of moving away from its traditional policy of fully supporting the NPT, and Australia would violate the South Pacific Nuclear-Free Zone Treaty in getting nuclear weapons. Any Australian move towards nuclear weapons could prompt counter-responses from our immediate neighbours and accelerate the erosion of non-proliferation norms.

If nuclear weapons are challenging, what about alternatives? Rod talks about trying to 'dilute the advantages that nuclear weapons confer'. How Australia might achieve that objective goes to the question of whether non-nuclear capabilities can effectively deter nuclear threats.

If we had to go nuclear, we'd not only need the infrastructure to develop and then sustain the nuclear forces we acquired (which means significant upfront and ongoing investment); we'd also have to think seriously about Australian nuclear strategy and doctrine to ensure we did deter effectively. Nuclear weapons and deterrence is a deadly serious business—it's not about bluffing. An Australian nuclear option would have to embrace a warfighting capacity that we'd need to be willing to use.

The most obvious choice for force structure would be continuous at-sea deterrence on submarines. But the Shortfin Barracuda SSK isn't designed for nuclear deterrence, and adding such a capability could limit its operational and tactical flexibility. And it takes time to develop such a capability, so if events continue to move quickly, we might simply be too late to respond and too slow to act.

If nuclear weapons are challenging, what about alternatives? Rod talks about trying to 'dilute the advantages that nuclear weapons confer'. How Australia might achieve that objective goes to the question of whether non-nuclear capabilities can effectively deter nuclear threats. A BMD system is commonly seen to be a non-nuclear counter to nuclear threats, but in reality the advantage always goes to the offence. It's cheaper to build more missiles or equip existing missiles with MIRV capabilities and overwhelm missile defences. US national missile defence is hideously expensive and not that effective. Even the US Navy's ship-based SM-3 interceptors are tested only under highly controlled conditions.

Certainly, there are options that under the right circumstances could allow pre-emptive strikes 'left of launch' to prevent use of nuclear weapons. That would demand intelligence which is persistent and penetrating of an adversary's leadership and command and control, and that is exceedingly difficult with likely major power threats. It would also demand a prompt-strike capability, based on either effective offensive cyberwarfare or forward-deployed precision kinetic strikes against missiles. There's no guarantee that such a capability could be developed, even by the United States, let alone Australia.

Rather than trying to counter nuclear threats symmetrically, an indirect and asymmetric approach might be better. Australia could consider acquiring the means to prevent a major-power adversary from projecting power against our vital strategic interests, including our air and maritime approaches, by developing anti-access and area denial (A2AD) capabilities that focus on the South China Sea and exploit vital maritime straits and chokepoints throughout Southeast Asia.

Australian A2AD would ideally focus on a tactical and operational offensive attack at source rather than maintain a traditional defence-in-depth

strategy. It would imply the ADF acquiring substantial air and sea capabilities suitable for rapid long-range strikes with precision non-nuclear weapons in sufficient mass to generate a meaningful effect, alongside developing more robust cyber and electronic warfare attack capabilities.

The objective would be to rob an opponent of the military capability needed not only to project power aggressively against us, but also to weaken it in comparison with other regional actors, such that it then would be poorly placed to defend its other strategic interests. Striking at vital interests of the opponent could also imply attacking national economic resilience in a way that threatens the political survival of a regime. Together, these factors could raise the cost of aggression to unacceptable levels, and thus, hopefully, deter such aggression, without resort to nuclear weapons.

Rod's initial question therefore stands and poses a strategic dilemma for Australia in an unpredictable outlook. We could develop a combination of alternatives—BMD (accepting its limitations), 'left of launch' pre-emption, and A2AD—in the absence of US extended nuclear deterrence, at great cost.

The problem with this indirect strategy is that it would require a substantial expansion of the ADF at great cost, and take considerable time. The nominal 2% of GDP target of the 2016 defence white paper would easily be breached. There's also a risk that an adversary with far larger forces could do the same to us, and, as a smaller actor, we're likely to be less resilient. Finally, in the absence of an Australian nuclear-weapons capability, the nuclear-armed major-power adversary always has escalation dominance.

Rod's initial question therefore stands and poses a strategic dilemma for Australia in an unpredictable outlook. We could develop a combination of alternatives—BMD (accepting its limitations), 'left of launch' pre-emption, and A2AD—in the absence of US extended nuclear deterrence, at great cost. Yet that still leaves us potentially facing a serious nuclear threat with no guarantee that these non-nuclear options will work as an effective deterrent in a major crisis.

Source: https://www.aspistrategist.org.au, 24 July 2018.

OPINION – Deandra Madeena Moerdaning

Why Indonesia Must Ratify Nuclear Weapon Ban Treaty

A year ago on July 7, 2017, the UNGA adopted a resolution that pushes forward a new treaty on the Prohibition of Nuclear Weapons. The agreement is the first of its kind that categorically prohibits nuclear weapons and hence focuses merely on disarmament. The treaty will only enter into force once 50 nations have ratified and acceded to it. As a nation whose representative was among vice presidents leading negotiations of the treaty and as a vocal opponent of nuclear weapons, it is crucial that Indonesia ratifies the Nuclear Weapon Ban Treaty immediately. Here are the key reasons why:

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As a member of the NAM and a coordinator of its working group on disarmament and nonproliferation since 1994, Indonesia was among co-sponsors of the above resolution. Indonesia signed this UN Treaty on Sept. 20, 2017, the day when it opened for signature at the UN headquarters in New York. Ironically, Indonesia is not among the ten nations that have ratified the treaty through national legislation.

It is of vital importance that Jakarta maintains its leadership role and show commitment to shared international security interests of developing countries, the majority of NAM member states.

Jakarta and NAM have always been vocal about attempts to eliminate double standards in international security, particularly regarding nuclear security.

On top of being an excellent example to ASEAN countries regarding compliance with non-proliferation regimes, Jakarta continues to encourage ASEAN member states and beyond to improve the persistently slow progress of the nuclear disarmament.

In a joint effort with ASEAN member states to combat the threat of nuclear weapons, during its chairmanship of the Association Jakarta opened the door for consultations between member states and nuclear-weapon states (NWS), to encourage the latter to sign the Southeast Asian Nuclear Weapon Free Zone Treaty (SEANWFZ).

In a joint effort with ASEAN member states to combat the threat of nuclear weapons, during its chairmanship of the Association Jakarta opened the door for consultations between member states and nuclear-weapon states (NWS), to encourage the latter to sign the Southeast Asian Nuclear Weapon Free Zone Treaty (SEANWFZ). Jakarta was praised for its efforts in promoting the spirit of the treaty beyond the region.

By ratifying the new Treaty, ASEAN member states would prove their determination to disarmament and making the region free from all kind of nuclear threats. Currently, only Thailand and Vietnam have ratified the treaty. Others, including Indonesia, were had signed the deal, while Singapore chose to abstain.

Indonesia should immediately follow the path of Thailand and Vietnam and together persuade Singapore to support the Nuclear Weapon Ban Treaty in the spirit of Southeast Asia's nuclear weapons-free zone. Once all ASEAN member states have ratified the Nuclear Weapon Ban Treaty, they can continue pressing wider acceptance of SEANWFZ to nuclear weapon states.

The previous 2015 NPT Review Conference was dubbed a failure due to absence of consensus on nuclear disarmament. Thus all parties including Indonesia must prepare themselves better for the next 2020 Conference and keep trying to achieve a shared vision on disarmament.

The 2015 conference manifested the non-nuclear-weapon states' concerns over the scale and pace of disarmament. These states believe there have been too many restrictions and demands for them regarding peaceful use of nuclear technology. They also think nuclear weapon states have been ignoring their obligation to disarm their nuclear arsenals. The 2020 Conference will be an excellent platform to reaffirm Jakarta's demand for nuclear disarmament and security as well as to pressure nuclear weapon states to manifest their commitment to nuclear disarmament.

Indonesian delegates should continue expressing concerns about international security, including the US administration's decision to withdraw from the Joint Comprehensive Plan of Action (JCPOA). According to our Foreign Ministry, Affairs, Indonesia regrets this decision as Jakarta believes that the JCPOA is an achievement of diplomacy and can maintain stability in the region and the world. Indonesia is still optimistic about the future of JCPOA and hence urges other JCPOA's signatories to maintain support for the agreement. Nuclear weapons present a real and imminent threat to humanity, thus Indonesia should not loosen efforts towards nuclear non-proliferation and disarmament. Ratifying the UN Treaty on the Prohibition of Nuclear Weapons means Jakarta is greatly concerned about the slow pace of disarmament.

Indonesia regrets this decision as Jakarta believes that the JCPOA is an achievement of diplomacy and can maintain stability in the region and the world. Indonesia is still optimistic about the future of JCPOA and hence urges other JCPOA's signatories to maintain support for the agreement.

Source: http://www.thejakartapost.com, 09 July 2018.

OPINION – Adam Vaughan, Lily Kuo

China's Long Game to Dominate Nuclear Power Relies on the UK

China wants to become a global leader in nuclear power and the UK is crucial to realising its ambitions. While other countries have scaled back on atomic energy in the wake of the Fukushima disaster, state-backed Chinese companies benefit from the fact that China is still relying on nuclear energy to reach the country's low-carbon goals.

"China is going in the opposite direction. The massive experience possessed by the Chinese nuclear industry, consistently building for the past 30 years and adopting various next-generation technologies, is being recognised by the global nuclear industry," said Zaf Coelho, the director of Asia Nuclear Business Platform, based in Singapore.

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The UK, where as many as six new nuclear power stations could be built over the next two decades, is an obvious export target for Chinese nuclear. If state-owned China General Nuclear Power (GNP) – the main player in China's nuclear industry – buys a 49% stake in the UK's existing nuclear plants, as it was recently reported to be considering, that would mark a significant expansion of China's role in the UK nuclear sector. But the depth of CGN's existing involvement in UK nuclear may surprise some.

The most high-profile project is the £20bn Hinkley Point C power station in Somerset, which is being built by EDF Energy with a French reactor design but was only made possible by CGN UK's 33.5% stake to underwrite its daunting finances. It was that Chinese ownership of a strategic piece of infrastructure that led Theresa May to temporarily halt the signing of the crucial subsidy deal for Hinkley when she became prime minister.

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Isabel Hilton, the CEO of Chinadialogue.net, said the UK opening up vital infrastructure to China was without parallel in the western world. "No other OECD country has done this. This is strategic infrastructure, and China is a partner but not an ally in the security sense. "You are making a 50-year bet, not only that there will be no dispute between the UK and China, but also no dispute between China and one of the UK's allies. It makes no strategic sense."

The UK has appeared amenable to Chinese investment, though recently the UK cybersecurity watchdog warned British telecommunications companies against dealing with Chinese tech firm ZTE. One expert acknowledges that security concerns are a potential check to Chinese ambitions.

… CGN is also drawing up plans for Bradwell B in Essex, where China hopes to showcase its own nuclear reactor technology. CGN UK holds the majority stake (66.5%) in the development company, with EDF in a supporting role. Then there is a third joint venture to get Bradwell's Chinese reactor design through the UK nuclear regulatory process.

Finally, there is Sizewell C in Suffolk, where EDF wants to build a clone of Hinkley Point C if it can attract enough private investment. CGN holds a 20% share. While Germany and other western countries have turned their backs on nuclear, the UK is strongly committed to new nuclear to meet its carbon goals and this means, despite security concerns, the government needs Chinese involvement.

Source: https://www. theguardian. com, 26 July 2018.

OPINION – Louis René Beres

How Sun Tzu Might Approach US Nuclear Strategy

Although nuclear strategy must, by definition, be shaped without historical precedent, it should contain certain ancient core concepts. The strategic postulates first laid down by Sun Tzu could be referenced usefully by the current architects of US nuclear strategy, especially with reference to an already nuclear North Korea, and to a plausibly future nuclear adversary in Iran. These first principles could be applied to US ally Israel, in consequence of their direct impact on US policies, and to ongoing North Korean military activity in Syria or the wider Middle East.

President Trump could learn from Sun Tzu's "Tao of Warfare" that the military world, like the world in general, "is what it is." Any contrived reduction in analytic complexity could result in a too risky distortion of strategic choices. To deal correctly with such inevitable complexity, what is needed is not attitude but preparation.

Ancient Chinese general and military strategist Sun Tzu's *The Art of War* should be studied by US President Donald Trump's senior military advisors. Their examination of the text ought to focus on maximizing the credible range of America's nuclear deterrent and on shaping the Pentagon's correlative order of battle.

Any nuclear war would obviously be unprecedented. The August 1945 US bombings of Japan were not instances of nuclear war, but rather singular and non-replicable atomic attacks in a conventional war. Because there has never been an actual nuclear war, nothing can reliably be said about determining such a conflict's probability. In science and mathematics, proper assessments of event probability must be based upon the determinable frequency of relevant past events.

President Trump could learn from Sun Tzu's "Tao of Warfare" that the military world, like the world in general, "is what it is." Any contrived reduction in analytic complexity could result in a too risky distortion of strategic choices. To deal correctly with such inevitable complexity, what is needed is not attitude but preparation.

Ultimately, the US summit imbroglio with North Korea was about implementing necessary dissuasions from future war, conventional as well as nuclear. Preventing a conventional conflict with Pyongyang is imperative not only because such an engagement could prove starkly injurious to US forces and nationals in South Korea and also to certain US regional allies, but because it could quickly escalating towards the nuclear threshold. Such an escalation could prove uncontrollable.

Whatever the results of the Singapore summit (a meeting that Donald Trump felt would be best managed through attitude rather than preparation), America's general strategy will remain embedded in various forms of deterrence, including nuclear deterrence. Going forward, whatever the ultimate outcomes of the summit, this basic strategy must remain rooted in one or several of the following six national security functions:

1. deterrence of large-scale conventional attacks by enemy states;
2. deterrence of all levels of unconventional attack by enemy states;
3. preemption of enemy-state nuclear attacks;
4. support of conventional preemptions against enemy-state nuclear assets;
5. support of conventional preemptions against enemy-state non-nuclear assets; and
6. nuclear war-fighting.

At some point in the future, President Trump may need to leverage US nuclear weapons in order to support certain forms of American conventional preemption. To proceed rationally in any such uncharted strategic territory, he would first need to determine whether any non-nuclear expressions of "anticipatory self-defence" could succeed operationally. In turn, this vital

determination would then depend upon a number of critical, interpenetrating and possibly synergistic security factors, including:

1. expected probability of North Korean first-strikes;
2. expected costs of North Korean first-strikes;
3. expected schedule of North Korean nuclear weapons deployment;
4. expected efficiencies of North Korean active defences over time;
5. expected efficiencies of US active defences over time;
6. expected efficiencies of US hard-target or "counterforce" operations over time;
7. expected reactions of unaffected regional enemies; and
8. Expected US and world community reactions to any considered American preemptions.

"Weighing strength," reminds Sun Tzu, "gives birth to victory." But any such prescribed measurement is exceedingly difficult to detach from subjective calculation. This means an American president ought never to assume he harbors an incomparably great capacity to maintain full control over unfolding events.

For President Trump and his counselors, other connections will need to be examined. Several would concern relationships between nuclear threat functions, primarily deterrence, and pertinent binding law. Contrary to conventional wisdom on law and geopolitics, nuclear deterrence does not function outside the ambit of international law. Since the Peace of Westphalia in 1648, international law (however regrettably) has had to rely upon assorted threat system dynamics of threat and counter-threat.

Several would concern relationships between nuclear threat functions, primarily deterrence, and pertinent binding law. Contrary to conventional wisdom on law and geopolitics, nuclear deterrence does not function outside the ambit of international law. Since the Peace of Westphalia in 1648, international law (however regrettably) has had to rely upon assorted threat system dynamics of threat and counter-threat.

This candid appraisal concerns even preemption, which can sometimes be construed as "anticipatory self-defense" under customary international law. This judgment of legal correctness includes an 8 July 1996 advisory decision of the International Court of Justice. The summary assessment concludes, "…in view of the current state of international law, and of the elements of fact at its disposal, the Court cannot conclude definitively whether the threat or use of nuclear weapons would be lawful or unlawful in an extreme circumstance of self-defense, in which the very survival of a State would be at stake."

In some respects, at least, this ICJ Advisory Opinion should concern US ally Israel even more urgently than the US directly. After all, nuclear deterrence, whether ambiguous or openly declared, remains indispensable to Israel's core survival needs.

The adequacy of international law in preventing both nuclear and conventional war in Northeast Asia – a war that could conceivably "spill over" to other regions, plausibly the Middle East – will depend upon more than formal treaties, customs, or the so-called "general principles of law recognized by civilized nations." Among other perils, North Korea has continued to send advanced weapons to Syria, including outlawed chemical weapons, thereby strengthening not only the openly criminal

North Korea has continued to send advanced weapons to Syria, including outlawed chemical weapons, thereby strengthening not only the openly criminal Damascus regime, but also the Shiite terrorist group Hezbollah, as well as Iran. The injurious consequences of any such arms transfers could be most consequential for Israel as it seeks to prepare for an expanding Iranian military presence within Syria.

Damascus regime, but also the Shiite terrorist group Hezbollah, as well as Iran. The injurious consequences of any such arms transfers could be most consequential for Israel as it seeks to prepare for an expanding Iranian military presence within Syria. It will also be contingent upon the success or failure of any competing US and North Korean military strategies in the region.

If President Trump's selected nuclear strategy should serve to reduce the threat and/or seriousness of future war, either because of successfully implemented forms of nuclear deterrence or because of "no alternative" preemptive strikes launched against an illegally nuclearizing North Korea, this strategy could be counted as an authentic component of international law enforcement.

In spite of America's advanced deterrent postures, there could still come a time when the power of Washington's implicit nuclear threat would be immobilized by enemy miscalculation, inadvertence, mechanical accident, false warnings, unauthorized firings (e.g., coups d'état), hacking, or even outright irrationality.

How should Washington proceed? Initially, President Trump would do well to consider Sun Tzu's principles concerning *diplomacy*. To be sure, suitable military preparations should never be neglected, but diplomacy must also preserve its place. By fusing power and diplomacy, says Sun Tzu, the objective of every state to weaken its enemies without engaging in armed combat can better be realized. Sun Tzu's overriding objective always links the ideal of complete victory to reciprocal strategies for planning offensives.

Today, this advice may seem obvious enough, yet current US strategic posture will depend heavily upon various forms of BMD. In principle, at least, by placing too much faith in its active defence systems, the US could become willing to accept certain excessive risks, and also to disavow any still remaining preemption options.

There is really no good reason to believe that the US nuclear deterrent could ever suitably reduce all conceivable nuclear threats from North Korea. In spite of America's advanced deterrent postures, there could still come a time when the power of Washington's implicit nuclear threat would be immobilized by enemy miscalculation, inadvertence, mechanical accident, false warnings, unauthorized firings (e.g., coups d'état), hacking, or even outright irrationality. Furthermore, a calculated US willingness to make such threats more conspicuous need not necessarily be matched by any greater likelihood of operational success.

Assuming operational rationality in the White House and in the Pentagon, the single most compelling factor in any US presidential decision on preemption against North Korea will likely be the perceived rationality of Kim Jung-un. If, after all, Kim were expected to strike at America or certain US allies with nuclear weapons irrespective of any anticipated US counterstrikes, American deterrence could fail altogether. This means that North Korean nuclear strikes could be expected even if Kim Jung-un had already understood that President Trump was willing and able to respond to Pyongyang's aggressions with devastating nuclear reprisals.

Any North Korean decision to strike in these circumstances would have been made in spite of US deployment of nuclear weapons in recognizably survivable modes, and in spite of the fact that those American rockets and bombs were able to penetrate North Korea's most sophisticated, effective, and widespread active defenses.

Some might argue, more or less persuasively, that the US has already lost any preemption option it once had with respect to North Korean nuclear weapons. As a result of enemy multiplication, dispersal, and hardening of infrastructures, goes this argument, President Trump can now only wait until the time comes for an after-the-fact response; that is, for inflicting punishment or retaliation. If this purely retributive argument is

correct, any such total US reliance upon deterrence and certain corollary active defenses could represent a fatal indifference to enduring general principles of classic Chinese military strategy.

Another section of *The Art of War* that could help President Trump compensate for any disproportionate reliance on nuclear deterrence and ballistic missile defence is the one in which Sun Tzu emphasizes the "unorthodox." Drawn from the school of thought that had crystallized as Taoism, the ancient strategist observes: "…in battle, one engages with the orthodox, and gains victory through the unorthodox."

In another complex passage, Sun Tzu discusses how the orthodox may be used in unorthodox ways, while an orthodox attack may still be unorthodox, at least when it is unexpected. Taken with appropriate seriousness by American strategic planners, this nuanced passage could prove a useful tool for meaningful tactical implementation, one that might exploit Kim Jung-un's presumed matrix of identifiable military objectives.

For President Trump, the "unorthodox" should be fashioned not only on the battlefield but also before the battle. To prevent the most dangerous forms of battle, or those military engagements that could subsequently descend into all-out unconventional warfare, Washington should fashion a number of new military postures. These advanced postures would focus on a reasoned shift from "orthodox" rationality to "unorthodox" irrationality. This sort of thinking is what the late American nuclear strategist Herman Kahn had earlier called the "rationality of pretended irrationality."

On several occasions, President Trump has demonstrated a quirky affection for postures of feigned irrationality. Such calculated pretense has to be performed with considerable finesse, however, to avoid its becoming a double-edged sword. Also worth noting is that any strategy of pretended irrationality would represent the diametric opposite of Sun Tzu's more general counsel. In Chapter One, entitled "Initial Estimations," he remarks that military success must always be based upon "rationality and self-control."

President Trump requires a pattern of thinking adapted not only by Sun Tzu, but also by some of his classic contemporaries in ancient Greece. To create a nuclear doctrine, he will need to fashion a genuinely usable "strategic dialectic." Any such interrogative method would ask and answer intersecting questions, sequentially, again and again, until all core security problems had been productively confronted head-on.

President Trump requires a pattern of thinking adapted not only by Sun Tzu, but also by some of his classic contemporaries in ancient Greece. To create a nuclear doctrine, he will need to fashion a genuinely usable "strategic dialectic." Any such interrogative method would ask and answer intersecting questions, sequentially, again and again, until all core security problems had been productively confronted head-on.

Following Sun Tzu's prescriptions on the "unorthodox," US strategists should approach the challenging North Korea security problem as an interrelated series of thoughts, one in which each thought necessarily presents a complication that then moves inquiry onward. Contained in this strategic dialectic, as Sun Tzu himself was no doubt aware, is a relentless obligation to continue thinking. (Logically, this imperative can never be satisfied entirely because of what philosophers call an "infinite regress problem," but it must be attempted as completely and competently as possible.)

Armed with such an explicitly dialectical form of military strategy, Trump could then focus not only on discrete threats and situations (most plausibly, North Korean nuclear weapons and ballistic missile development), but also on multiple dynamic interactions between particular threats ("synergies").

Sun Tzu can offer Trump the still timely wisdom that strategy and war planning are fundamentally intellectual activities. Especially because Kim Jung-un already commands a nuclear arsenal, one he will most assuredly refuse to destroy, America's emphasis must be on using its combined military assets to create stable deterrence rather than to wage war. "Subjugating the enemy's army without fighting," says Sun Tzu in *The Art of War,* "is the true pinnacle of excellence."

The ancient Chinese strategist also devotes a good deal of attention to the necessary "ruler's qualifications."

Sun Tzu can offer Trump the still timely wisdom that strategy and war planning are fundamentally intellectual activities. Especially because Kim Jung-un already commands a nuclear arsenal, one he will most assuredly refuse to destroy, America's emphasis must be on using its combined military assets to create stable deterrence rather than to wage war.

From this listing, Trump could be reminded that "The ruler cannot mobilize the army out of any personal anger." He could also learn the following leadership strengths: wisdom; knowledge; benevolence; unconcern for fame; tranquility; and righteousness. Correspondingly, leaders' weaknesses can include: obsession with achieving fame; quickness to anger; haste to act; inability to fathom the enemy; and personal arrogance.

In complex military affairs, generality is an indispensable trait of explanatory and predictive meaning. Strategic theory represents an important net with which both planners and policy-makers can catch whatever is most vital. To think otherwise, or to approach every major military crisis as somehow analytically discrete or *ad hoc,* would represent nothing less than a form of national surrender. To avoid such surrender, it would profit President Trump to heed the timeless strategic principles of Sun Tzu.

Source: https://besacenter.org, 06 July 2018.

NUCLEAR STRATEGY

RUSSIA

Russia Announces New Nuclear Weapons Tests Days after Trump-Putin Summit

Russia is reportedly testing a range of new nuclear weapons and other military hardware including a high-powered laser, just days after Russian President Vladimir Putin met with President Trump for a one-on-one summit in Finland. The Associated Press reported that Russia had tested weapons that range from the laser weapon system to a nuclear-powered cruise missile. The cruise missile is reported to have "unlimited" range.

On 12 July, the country's Defense Ministry reportedly said that it had tested the Burevestnik cruise missile and is now preparing it for a flight test. "The program of the system's pop-up tests has been completed with the positive results, which makes it possible to switch to preparations for the flight trials of the Sarmat missile complex," the Defense Ministry said, according to Tass, a Russian news agency.

Military officials in Russia said the country is practicing how to utilize a Peresvet high-powered laser weapon system. It is also practicing trials of the Poseidon underwater nuclear drone. The development comes after Trump and Putin concluded a high-stakes summit in Helsinki.

The AP also notes that military officials in Russia said the country is practicing how to utilize a Peresvet high-powered laser weapon system. It is also practicing trials of the Poseidon underwater nuclear drone. The development comes after Trump and Putin concluded a high-stakes summit in Helsinki.

Trump has faced bipartisan criticism over his refusal to denounce Russia for interfering in the 2016 presidential election. But Trump and the White House have sought to walk back his

remarks appearing to accept Putin's denial. Trump told reporters that he misspoke, and added in a Wednesday interview with CBS that he holds Putin responsible.

Trump added that he wants to have a second meeting with Putin to implement things regarding topics they discussed, including nuclear proliferation. "I look forward to our second meeting so that we can start implementing some of the many things discussed, including stopping terrorism, security for Israel, nuclear proliferation, cyber attacks, trade, Ukraine, Middle East peace, North Korea and more. There are many answers, some easy and some hard, to these problems...but they can ALL be solved!" Trump said on Twitter.

The Ministry of Defence in Moscow proudly aired footage of what it claims was an attack by Pacific Fleet submarine Tomsk on a ship 93 miles away in the Sea of Okhotsk. It was the latest of a series of videos broadcast by Russia to highlight the country's battle prowess – however, the latest footage has been debunked.

Source: Justin Wise, http://thehill.com, 17 July 2018.

Russia's Nuclear-Powered Arsenal is 'Highly Exaggerated'

Russia's boasts around its new arsenal of nuclear super weapons may have been greatly exaggerated, according to industry experts. A number of experts have come forward to debunk some of the myths put forward by the former Soviet Union in response to its recent posturing. Neil Gibson, senior weapons analyst for the firm Jane's by IHS Markit, told MailOnline that certain claims around its weaponry were 'highly exaggerated'.

Meanwhile, nuclear expert at the Middlebury Institute of International Studies at Monterey, Jeffrey Lewis said Russia's most recent claims around its hypersonic Kinzhal missile are 'bats crazy'. It comes as footage revealed the Russian Ministry of Defence faked a cruise missile attack from a nuclear submarine.

It was aired on state owned TV as part of a demonstration of Russia's military might. However, eagle-eyed viewers spotted the video was in fact a re-run of a clip first broadcast in 2016. The video was recently aired again as part of a raft of propaganda to promote Vladimir Putin's new super missiles, which he claims will be able to strike anywhere on the planet.

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Japan has selected a version of the Lockheed Martin Long Range Discrimination Radar (LRDR) for its planned two Aegis Ashore batteries, the land-based variant of the Aegis combat system, in an upgrade of the country's ballistic missile defence capabilities, according to a Japanese MoD official.

Eagle-eyed viewers in Russia have mocked the video, pointing out that the footage is of a training strike, originally broadcast on TV Zvezda – owned by the ministry – almost two years ago. At the time, the footage was described as a Moskit missile strike on a ship posing as an enemy off Crimea in the Black Sea. Crimea is some 6,500 miles (10,000 km) from the Sea of Okhotsk. The original announcement from the Ministry said: 'During the Kavkaz-2016 military exercises in the Crimea…the anti-ship missile "Moskit" was deployed."

Source: Tim Collins and Will Stewart, http://www.dailymail.co.uk, 25 July 2018.

BALLISTIC MISSILE DEFENCE

JAPAN

Japan Selects Lockheed Martin Radar for New Ballistic Missile Defence System

Japan has selected a version of the Lockheed Martin Long Range Discrimination Radar (LRDR) for its planned two Aegis Ashore batteries, the

land-based variant of the Aegis combat system, in an upgrade of the country's ballistic missile defence capabilities, according to a Japanese MoD official who spoke to Reuters on the condition of anonymity.

The two Aegis Ashore batteries, fitted with Lockheed Martin's LRDR system, are expected to strengthen Japanese defences against China's and North Korea's growing and increasingly more sophisticated ballistic and cruise missile arsenals. The government plans to deploy the two batteries by 2023 at an estimated cost of around $4 billion. The Aegis Ashore sites will supplement Patriot batteries capable of engaging short- and medium-range ballistic missiles in their terminal phase and Aegis-equipped guided-missile destroyers, four of which are currently in service with the Japan Maritime Self-Defence Force (JMSDF).

The procurement of LRDR means that the Aegis Ashore sites would be able to fire their missiles at an extended range. For example, SM-3 Block IIA interceptors are estimated to have a maximum operational range of 2,500 km (1,350 miles).

According to the Japanese official, the MoD selected the LRDR over Raytheon's SPY-6 due to lower lifecycle costs and its sophisticated target discrimination capabilities, which a Lockheed Martin official defined back in 2017 as the "ability to do precise, long-distance detection and characterization of ballistic missiles." Not much is publicly known about the LRDR. According to the Lockheed Martin website: "LRDR is a long range radar that will provide precision metric data to improve ballistic defence discrimination and replace existing sensors in the BMDS." The radar uses proven solid-state radar technologies with proven ballistic missile defence algorithms for target selection.

The procurement of LRDR means that the Aegis Ashore sites would be able to fire their missiles at an extended range. For example, SM-3 Block IIA interceptors are estimated to have a maximum operational range of 2,500 km (1,350 miles). (The U.S. State Department approved a possible sale of SM-3s in January of this year.) The missile "is designed to destroy short- to intermediate-range ballistic missile threats. The SM-3 has been successfully flight tested in February [2017] when it destroyed a medium-range ballistic missile target," I reported previously. "However, the missile failed another intercept test in June [2017]." Another SM-3 missile test failed in January 31.

Japan's Aegis Ashore batteries will also be armed with the supersonic SM-6 missile interceptor with an estimated range of over 180 miles (290 kilometres). "The missile was originally designed for anti-air warfare, anti-surface warfare missions". "Yet in 2015, the missile was modified for terminal ballistic missile defence to supplement U.S. Navy SM-3 ballistic missile interceptors deployed at land-based Aegis Ashore sites and Aegis-equipped warships."

The US Missile Defense Agency has awarded a $73 million worth contract to L-3 Communications for upgrading the High Altitude Observatory (HALO) systems for carrying out the Ballistic Missile Defense System tests requirement. The contract announced by the Department of Defense has the basic contract ceiling being increased by $73,223,000 from $564,153,809 to a maximum of $637,376,809.

In order for a missile interceptor to hit an incoming ballistic missile, the Aegis combat system would have to start tracking the missile in its ascent phase and launch interceptors before it overflies the Aegis ashore site. The MoD has so far not publicly confirmed the selection of the LRDR for its future Aegis Ashore batteries.

Source: https://thediplomat.com, 04 July 2018.

USA

L-3 Wins $73M for HALO Aircraft for Ballistic Missile Defense System Test Requirements

The US Missile Defense Agency has awarded a $73 million worth contract to L-3 Communications for upgrading the High Altitude Observatory (HALO) systems for carrying out the Ballistic Missile Defense System tests requirement. The contract announced by the Department of Defense

has the basic contract ceiling being increased by $73,223,000 from $564,153,809 to a maximum of $637,376,809. The $73,223,000 modification will allow the contractor to procure "three used aircraft required to modernize the High Altitude Observatory (HALO) systems used by the Missile Defense Agency to collect electro-optic and infrared imagery during tests of the Ballistic Missile Defense System," the release states. The work will be performed in Tulsa, Oklahoma, by L-3 Aeromet. The performance period is from July 2018 to approximately June 2021, it said.

Fiscal 2018 research, development, test and evaluation funds will be obligated on various task orders issued for HALO modernization efforts, which will include the added scope for aircraft procurements, the release added. The HALO is an instrumented Gulfstream II-B optical data collection aircraft providing airborne collection of multispectral, imaging, optical signature data on targets of interest including re-entry vehicles, missile plume phenomenology, and missile/target intercepts, and intercept debris characterization and kill assessment.

Source: http://www.defenseworld.net, 21 July 2018.

NUCLEAR ENERGY

BANGLADESH

Bangladesh Plans Nuclear Power Plant at Hilsa Sanctuary

Bangladesh has undertaken a number of initiatives to preserve its national fish – the Hilsa. But the site chosen for its second nuclear power plant, is at a Hilsa sanctuary. The first nuclear plant, already under construction, is the 2,400 MW Rooppur Power Plant.

The Bangladesh Atomic Energy Commission has chosen 2,000 acres (8.1 square kilometres) of land in Barisal district to set up the plant at the bank of the Meghna river. The exact location will be Char Megha (a river island) between Hizla and Mehendiganj of the coastal district. This is the same area that the government recently declared the country's sixth Hilsa sanctuary.

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China's nuclear power is much cheaper (420 renminbi [US$63] per 1000 kWh) than solar and wind renewables and is close to coal-fired power. China investment in nuclear plants is projected to increase by 24% in the next 12 years – faster than investment in natural gas and renewables under the Sustainable Development Plan. China's 58GW nuclear target will likely slip to 2022, China had talked about a target of 150GWe of nuclear power in 2030.

"We have already seen three-four sites on the coast for the power plant. Of them, Char Megha is the best considering water availability and [low] population," said AFM Mizanur Rahman, the project director. …Fisheries experts fear that the government's decision will spell disaster for future Hilsa production – which accounts for 12% of the total fish catch in Bangladesh. …

Source: Abu Siddique, https://www.thethirdpole.net, 17 July 2018.

CHINA

China will Still Push for More Nuclear Power to Displace Coal

China's nuclear power is much cheaper (420 renminbi [US$63] per 1000 kWh) than solar and wind renewables and is close to coal-fired power. China investment in nuclear plants is projected to increase by 24% in the next 12 years – faster than investment in natural gas and renewables under the Sustainable Development Plan. China's 58GW nuclear target will likely slip to 2022, China

had talked about a target of 150GWe of nuclear power in 2030. However, 115 GWe or perhaps more should be achievable in 2030. The potential 0.05 cents per kwh is the $50 per Megawatt hour cost that China has for nuclear power. The US Energy Information Administration has levelized cost of ownership for US power being completed in 2022. US nuclear power is two times or more the cost of China's nuclear power.

Source: https://www.nextbigfuture.com, 16 July 2018.

GENERAL

Investment in New Nuclear Declines to Five-Year Low

Total global energy investment totalled USD1.8 trillion last year, a 2% decline in real terms from 2016, the IEA said in its newly-published report, World Energy Investment 2018. The power generation sector accounted for most of this decline, owing to fewer additions of coal, hydro and nuclear power capacity, which more than offset increased investment in solar photovoltaics, according to the IEA. More than USD750 billion was spent on the electricity sector last year, while USD715 billion was spent on oil and gas supply. After several years of growth, investment in renewables and energy efficiency declined by 3% in 2017.

Over the past five years, nuclear plants with a total capacity of over 40 GWe have obtained permission to extend their operational lifetime beyond 40 years, the report notes. Investment over that period averaged around USD7 billion - three times more than over the previous five years.

Of the four new reactors commissioned last year, three were in China. More than 5 GWe of nuclear generating capacity was retired, leading to a net reduction of about 2 GWe in total nuclear capacity worldwide. Capacity was still about 10 GW higher than in 2007. While around 60 GWe of nuclear power remains under construction worldwide, new construction starts totalled just over 3 GWe.

Modernisations and upgrades of existing reactors represented about half of total nuclear investment last year. "Large investments have recently been made in OECD countries to extend lifetime operation and power uprates of the existing nuclear fleet," the IEA said. "In general, spending on existing plants yields more output per dollar invested."

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"Assuming these plants run an extra ten years, generation from lifetime extensions over the past five years is equivalent to 15% of expected lifetime output from solar PV and wind investments over the same period, at just 3% of the cost," the IEA said. "At 20 years of long-term operation, the output from these upgrades would be equivalent to one-third of expected lifetime output from the solar PV and wind investments."

The IEA suggests that lifetime extensions could be "a cost-effective transitional measure for maintaining low-carbon generation in the face of uncertainties for new nuclear plant development or that for other low-carbon sources". However, it notes that such extensions require "supportive regulatory and technical factors".

Access to both direct and indirect government finance remains vital for investments in nuclear power, the report says. "Most investment in new nuclear capacity has occurred in markets where the government retains full ownership or a majority stake in most of the utilities." Investment in nuclear power also remains highly dependent on government involvement in various areas, including market structure, price regulation and financing.

World Nuclear Association Director General Agneta Rising told delegates at the Atomexpo 2018 conference in Sochi in May: "In the five years from 2015 to 2019 we should see 55 new reactors start in 12 countries, two of those countries

hosting their first nuclear power plant. With a combined capacity of 55 GWe this new nuclear generation will avoid the emission of more than 400 million tonnes of carbon dioxide each year, compared to coal. It is equivalent to adding nearly 15% to global nuclear capacity," she said.

The Harmony goal, put forward on behalf of the nuclear industry by World Nuclear Association, is a vision of a future energy system where nuclear energy supplies 25% of global electricity demand by 2050 as part of a low-carbon generation mix, which would require 1000 GW of new nuclear build. This will need a level playing field in energy markets, optimising all existing low-carbon energy resources already in place and driving investment in future clean energy, as well as an effective safety paradigm focusing on genuine public wellbeing.

Source: http://www.world-nuclear-news.org, 17 July 2018.

Together 21 nuclear power reactors, with an installed capacity of 15,700 MW are under implementation and envisaged for progressive completion by 2031. Besides, in-principle approval has been given for five sites for setting up nuclear plants, he said during the Question Hour. These sites are in Jaitapur (Maharashtra), Kovvada (Andhra Pradesh), Chhaya Mithi Virdi (Gujarat), Haripur (West Bengal) and Bhimpur (Madhya Pradesh).

INDIA

21 Nuclear Reactors with 15,700mw Total Installed Capacity under Implementation

Twenty one nuclear reactors with a total installed capacity of 15,700 Mw are currently under construction, the government said 25 July. However, it ruled out increasing the generation capacity of the existing plants. Currently, there are nine nuclear power reactors at various stages of construction which are expected to be completed by 2024-25, Union Minister Jitendra Singh said in the Lok Sabha.

In reply to questions, he said 12 more reactors were accorded administrative approval and financial sanction in June last year. The Minister of State in the Prime Minister's Office said that together 21 nuclear power reactors, with an installed capacity of 15,700 MW are under implementation and envisaged for progressive completion by 2031.

Besides, in-principle approval has been given for five sites for setting up nuclear plants, he said during the Question Hour. These sites are in Jaitapur (Maharashtra), Kovvada (Andhra Pradesh), Chhaya Mithi Virdi (Gujarat), Haripur (West Bengal) and Bhimpur (Madhya Pradesh).

To a query on whether the government was considering increasing the capacity of the existing nuclear power plants, Singh replied in the negative. "The existing units are operating at their rate capacity. The unit size of indigenous PHWRs has already been increased from 220 MW to 540 MW and then to 700 MW, which are now under construction. "In addition, Light Water Reactors of 1,000 MW have also been introduced with foreign cooperation," the minister said. Singh also said the government has taken several measures to enable setting up of nuclear power reactors. These include resolution of issues related to Civil Liability for Nuclear Damage Act and creation of Indian Nuclear Insurance Pool, he added.

Source: https://energy. economictimes. indiatimes. com, 18 July 2018.

NIGER

IAEA Praises Niger's Nuclear Energy Commitment

An IAEA mission team says Niger has a 'strong commitment' to developing infrastructure for nuclear power programmes, following a review of the country's nuclear infrastructure status. The mission was first conducted in April with its final report submitted to the Nigerian government on 16 July. It is one of the IAEA's Integrated Nuclear Infrastructure Review (INIR) missions, which allow IAEA member states to assess national infrastructure needed for the introduction of nuclear power.

Mission teams are made up of international experts from France, Morocco, Spain and the UK, as well as members of IAEA staff. Prior to the mission in Niger, the country conducted a self-

evaluation covering all existing infrastructure issues and submitted it to the IAEA. Led by IAEA Deputy Director General and Head of the Department of Nuclear Energy Mikhail Chudakov, the mission team gave its concluding report to Nigerian Energy Minister Amina Moumouni in Niamey on 16 July.

Chudakov said that is he is 'encouraged that even though Niger is still in an early phase, it has already enacted a comprehensive nuclear law, established an independent nuclear regulatory authority, and is currently reviewing existing regulations and developing appropriate new ones'.

The team included seven recommendations and 17 suggestions in the report that aim to help Niger to continue progressing its infrastructure development. These include implementing a legal and regulatory safety framework, developing an integrated view of net nuclear power plant project costs, and strengthening activity management for prospective nuclear power projects.

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Niger's economic development is largely hindered by the inconsistency of its electricity supply and alternative power sources are being increasingly considered to try and remedy instances of short supply for its some 21 million inhabitants. Modifying its energy mix to include more nuclear power is being seriously considered as an option. Currently, the country is the fourth largest producer of uranium ore in the world.

The INIR mission report is expected to be published on the IAEA website 90 days following its delivery to the member state unless Niger has requested it does not do so. INIR missions are based on the agency's Milestones Approach, which includes 19 Infrastructure Issues, three Phases, and three Milestones. The scheme divides the process of establishing a nuclear power programme into three progressive development phases, with the duration of each reliant on the country in question's level of commitment and the resources available.

Source: https://www.power-technology.com, 19 July 2018.

UAE

UAE's First Nuclear Reactor Gets Electricity Generation Licence

The Department of Energy has issued an electricity generation licence to Barakah One Company, the joint venture subsidiary company owned by the Emirates Nuclear Energy Corporation (ENEC) and the KEPCO. The licence is a key regulatory requirement before operation of the first of four reactors at Al Dhafra, Abu Dhabi, a statement said.

It added that the licence is an important milestone in advance of Nawah, the operating and maintenance subsidiary of ENEC and KEPCO, obtaining the operating licence from the Federal Authority for Nuclear Regulation (FANR). Awaidha Murshed Al Marar, chairman of the Department of Energy, said that generating electricity from nuclear energy is one of the best long-term solutions for the production of clean, efficient and reliable power to support UAE's continued economic growth and diversification.

He added that the licence granted to Barakah One Company is the first of its kind in the region that will ultimately allow it to generate electricity from nuclear energy. … Earlier in July, the UAE said that its first nuclear reactor would come online in late 2019 or early 2020, further delaying the launch of the Arab World's first atomic power station. Construction of the first of four reactors at the

$20 billion Barakah plant has been completed and had been due to come online last year.

Source: Sam Bridge, https://www.arabianbusiness. com, 25 July 2018.

USA

US Markets, Politics Drive Nuclear Power Expansion in the South

The expansion of nuclear capacity in the US Southeast may contrast with its contraction elsewhere, especially in competitive wholesale power markets, but the reasons, in effect, remain tied as much to supply and demand as they are to politics. For example, last announcement that the Tennessee Valley Authority had ramped up its Browns Ferry Unit 3 to full power contrasts with claims from nuclear power operators in competitive market areas, who have either shut down nuclear plants or threatened to do so without state subsidies.

The expansion of nuclear capacity is partly designed to achieve the TVA goals of expanding low- or zero-carbon power capacity. The TVA website maintains that 54% of its current capacity is from zero-carbon resources such as nuclear and hydro, and TVA plans to raise that percentage to 59% by fiscal year 2027.

The TVA's announcement involved the addition of 155 MW to the 1,155-MW unit, while two other plants of similar size are slated to receive by next summer similar upgrades, bringing the nuclear power plant site up to more than 3,900 MW of capacity, at a cost of about $475 million.

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Over the past 20 years, nuclear plants have already completed such upgrades in northern and competitive areas where supplies are shorter and natural gas prices have been higher. "In the South, they are a little behind, because the worst over-capacity in the has always been that SERC Corp. area," which includes much of TVA's footprint, Carson said.

Today, in the Mid-Atlantic states, the Midwest and the New England, cheap natural gas and the proliferation of subsidized renewables have made nuclear power much less economically viable, Carson said. "I think the bellyaching that is going on in the whole area of nuclear and coal is just silly," Carson said. "They should get used to the fact that power driven by $3/MMBtu gas is going to be the norm." In the South, renewables are not so prevalent as they are in the Midwest, natural gas capacity is not as common as it is becoming in PJM, and the TVA has been shutting down coal-fired capacity. …

Source: Mark Watson, https://www.spglobal.com, 26 July 2018.

NUCLEAR COOPERATION

ARGENTINA–BELGIUM

Argentina, Belgium Extend Nuclear Safety Cooperation

A memorandum of understanding was recently signed between Nucleoeléctrica Argentina SA (NA-SA) and Belgium's Nuclear Research Centre (SCK-CEN) aimed at extending cooperation on nuclear safety between the two organisations that has existed for more than 15 years.

The MoU was signed in Buenos Aires on 26 June by Derrick Gosselin, Chairman of SCK-CEN's Board of Governors, Hamid Aït Abderrahim, Deputy Director-General of SCK-CEN, and Rubén Omar Semmoloni, Director-General of NA-SA. The signing took place in the presence of Princess Astrid of Belgium and a Belgian parliamentary delegation that included Minister of Foreign Affairs

Didier Reynders and Secretary of State for Foreign Trade Pieter De Crem. The delegation was part of an economic mission by the Belgian government to Argentina and Uruguay.

The MoU defines the framework for cooperation on issues related to inspection programmes for the steel and internal components of reactor pressure vessels; aging and degradation of materials; long-term operation of nuclear power plants; waste management and disposal; and training and education. NA-SA and SCK-CEN agreed to long-term cooperation in 2002. In 2008, they signed a framework agreement to carry out consultancy and services for the Atucha I, Atucha II and Embalse nuclear power plants. …

Source: World Nuclear News, 06 July 2018.

BANGLADESH–RUSSIA

Bangladesh Starts Building Second Large Rooppur Nuclear Power Reactor

First concrete has been poured to commence the construction of Rooppur unit 2 in Bangladesh, 160 km north of Dhaka. Russia's Atomstroy export started construction of its twin VVER-1200 reactor in November last year. Novovoronezh II is the reference plant. Commercial operation of the two units is expected in 2023 and 2024. All fuel for Rooppur is being provided by Rosatom, and all used fuel is to be repatriated to Russia, in line with standard Russian practice for such countries.

The $12.65 billion project is 90% financed by Russia's Bank for Development and Foreign Economic Affairs. It is a turnkey project, and Rosatom will maintain the plant for the first year of operation before handing over to Bangladesh Atomic Energy Commission. The IAEA has a close involvement with the project, and India's GCNEP is engaged as consultant for construction and operation of the project.

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Source: World Nuclear Association, 13- 20 July 2018.

INDIA–RUSSIA

Russia Ships Key Equipment for Kudankulam Nuclear Plant

Atomenergomash, a machine-building division of Russia's Rosatom State Atomic Energy Corporation manufactured has shipped out key set of equipment for the Kudankulam Nuclear Power Plant (KKNPP) in India. The equipment includes Moisture Separator Reheaters and High Pressure Heaters for KKNPP Unit 3 as well as spare parts for the scheduled maintenance of Reactor Coolant Pumps at KKNPP Units 1&2. Moisture Separator Reheaters, manufactured by ZiO-Podolsk, a subsidiary of Atomenergomash, are designed to remove water condensed from the process steam to maximize thermal efficiency and reliability of the low pressure turbine. The weightof equipment is 47 tones; height is 7 meters; diameter is 4 meters.

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High Pressure Heaters with a length of more than 11 meters, that weigh 120 tones, pre-heat feedwater, delivered to a steam generator. The equipment is the one of the main elements of the turbine island, where the thermal energy is extracted from pressurized steam and converted into electrical energy.

The total weight of the equipment for KKNPP Unit 3 is more than 1000 tones. In total, there will be eight sets of Moisture Separator Reheaters and High Pressure Heaters. Spare parts for the Reactor Coolant Pumps, manufactured by CDBMB (also a subsidiary of Atomenergomash) weigh 50 tones and include bearings, thrust rings and electromagnets. The Reactor Coolant Pumps are used to pump primary coolant (water) around the primary circuit to remove the heat generated in the reactor core. ..

Source: Dipanjan Roy Chaudhury, The Economic Times, 20 July 2018.

IRAN–USA

Iran Hints at Nuclear Cooperation with US

Officials at the Iranian nuclear agency said, Tehran could be more transparent in its nuclear endeavours to alleviate some of America's concerns. However, the Ayatollah regime said the U.S. must stop what it calls "hostile" policies toward Iran. This comes as the Treasury Department is set to slap two rounds of sanctions on the Islamic republic

The Ayatollah regime in Iran is signalling that it is open for nuclear cooperation with the United States. Officials at the Iranian nuclear agency said, Tehran could be more transparent in its nuclear endeavours to alleviate some of America's concerns. However, the Ayatollah regime said the U.S. must stop what it calls "hostile" policies toward Iran. This comes as the Treasury Department is set to slap two rounds of sanctions on the Islamic republic, while the country is mired in a wave of domestic civil unrest.

Ayatollah regime officials urged for better relations between the U.S. and Iran. "America is a country that has good technology, if it had good leaders too, it would be able to work very well with Iran and other countries, in a way that both parties could benefit," said Behrouz Kamalvandi, spokesman for Iran's Atomic Energy Agency. "There is ground for nuclear cooperation if a political situation is ready, but that's highly unlikely — first they need to stop being selfish." Israeli intelligence recently exposed — what it says– is a military component of Iran's nuclear program. Some say Tehran could be seeking better relations with the U.S. for the purposes of regime protection.

Source: http://www.oann.com, 17 July 2018.

SOUTH AFRICA–RUSSIA

Brics Nuclear Clarification a Major Plus

One of the most positive outcomes from the 10th annual Brics Summit was the clarification President Cyril Ramaphosa gave to his Russian counterpart, Vladimir Putin, on the nuclear issue. This is according to Lumkile Mondi, senior lecturer at the Wits University school of economics. "The nuclear thing remains an albatross around our neck," Mondi told Fin24.

South Africa was currently unable to afford a multi-billion-rand nuclear build programme. Moscow has been pursuing nuclear energy expansion in Africa, and state-owned company Rosatom is building a nuclear power plant in Egypt. It signed an MoU with Rwanda in June. Mondi questioned why other countries such as France, the US and South Korea, who also signed MOUs for nuclear cooperation with Pretoria, haven't asked about the agreements.

According to Presidency Spokesperson Khusela Diko, the MoU for nuclear cooperation, signed with Russia previously, formed part of the bilateral talks between the two countries on 26 July, which took place on the sidelines of the Brics summit in Sandton.

Ramaphosa took the opportunity to explain to Putin that South Africa was currently unable to afford a multi-billion-rand nuclear build programme. Moscow has been pursuing nuclear energy expansion in Africa, and state-owned company Rosatom is building a nuclear power plant in Egypt. It signed an MoU with Rwanda in June. Mondi questioned why other countries such

as France, the US and South Korea, who also signed MOUs for nuclear cooperation with Pretoria, haven't asked about the agreements. "Why did Putin believe it was his?" Mondi commented. Speaking at the World Economic Forum in Davos in January, Ramaphosa said the country was unable to afford nuclear power.

Fin24 reported earlier that In April 2017 the Western Cape High Court ruled that certain of the state's decisions around the procurement of nuclear power were unlawful. In June, Energy Minister Jeff Radebe said SA no longer had an agreement with Russia to build nuclear power stations due to the court ruling.

A Fresh Chance: Mondi said that SA hosting the Brics summit was a chance "to re-establish ourselves" internationally, and proved that Pretoria could handle different interest groups. "This is what we lost under Zuma…that role of playing peacemaker; we became rouge." Mondi warned, however, that SA shouldn't over-commit itself financially to Brics institutions such as the NDB and the Contingency Reserve Agreements, as the country had other multilateral commitments such as the African Union and the International Monetary Fund.

Pretoria should also take the public into its confidence and reveal the terms of loan agreements, with a R33bn figure from the China Development Bank going to Eskom, and Transnet receiving R4bn from the Industrial and Commercial Bank, according to Mondi. African countries and other emerging markets, including Argentina and Turkey, had an opportunity on Friday (27 July) morning to address the five Brics heads of state and hold bilateral meetings. Mondi said that it was difficult for smaller countries on the continent to gain access to world leaders, and SA provided a platform for this.

Source: https://www.fin24.com, 27 July 2018.

URANIUM PRODUCTION

USA

US Considers Tariffs on Uranium Imports

The US Department of Commerce opened an investigation into the nature of uranium imports, ostensibly with an eye to imposing tariffs on ore and other uranium products. Uranium is used in the production of nuclear energy, and currently only five percent of uranium used in the US nuclear energy industry comes from the US. The remaining 95 percent is imported from a variety of countries, with Canada leading, followed by Australia, Russia, and Kazakhstan.

The investigation announcement invokes Section 232 of the Trade Expansion Act, which allows the federal government to assess imports on the basis of national security. Section 232 has been seldom used since it was signed by President John F. Kennedy in 1962, but it was used most recently this March by the Trump administration to levy tariffs on steel and aluminium.

The investigation announcement invokes Section 232 of the Trade Expansion Act, which allows the federal government to assess imports on the basis of national security. Section 232 has been seldom used since it was signed by President John F. Kennedy in 1962, but it was used most recently this March by the Trump administration to levy tariffs on steel and aluminium.

In a press release announcing the uranium investigation, Commerce Secretary Wilbur Ross was quoted as saying: "Our production of uranium necessary for military and electric power has dropped from 49 percent of our consumption to five percent." The press release added that the investigation was spurred by petitions from two US uranium mining companies and was pushed forward after consultation with the US Department of Defense and the Department of Energy.

If the federal government does decide to place import tariffs on uranium, higher prices for reactor fuel could make it harder for nuclear power plants to produce power economically. Such a move would be at odds with the apparent motives of the Department of Energy, which has spent more than a year trying to find ways to keep economically struggling coal and nuclear plants

in operation.

Ars reached out to the Department of Energy for comment but did not receive a reply. The Department of Commerce told Ars that "Section 232 investigations take into account the domestic production needed for projected national defence requirements, including the nuclear power utility industry," adding, "Any further inquiry along this line should be forwarded to DOE." Bloomberg reports that the two US uranium-mining companies that petitioned the Department of Commerce were Energy Fuels and Ur-Energy. Among nuclear power companies that could lose out if tariffs are imposed is FirstEnergy Corp., which filed for bankruptcy in April and petitioned the Department of Energy to bail it out. FirstEnergy also owns coal plants throughout the Midwest.

Source: https://arstechnica.com, 22 July 2018.

NUCLEAR DISARMAMENT

NORTH KOREA

North Korea Presents Nuclear Disarmament's Biggest Challenge Yet

Siegfried Hecker, a professor who used to run America's nuclear laboratory at Los Alamos, recalls the most recent of the seven trips he has made to North Korea, in 2010. His hosts were showing off their sprawling Yongbyon atomic-energy complex. With a blend of shyness and defiance, they displayed an astonishing spectacle: a hall with 2,000 brand-new centrifuges, machines that enrich uranium, either for electricity or nuclear bombs.

Apparently assembled in another, unsuspected site, they had appeared in Yongbyon since Mr Hecker's previous trip in 2008. This implied that, besides its existing plutonium-based technology, the country could make nuclear bombs from uranium. He was also shown the beginnings of a light-water reactor that could produce more plutonium. The message: "We have more nuclear capacity than you think, and you'll never know how much...."

North Korea's arsenal has since grown. Estimates range from 20 to 60 warheads, and its latest test was apparently of a hydrogen bomb, 100 times bigger than the earliest devices. It has also made strides in developing missiles; one tested last year could have reached America. The whole nuclear and military complex may involve 100 sites besides Yongbyon. The world's knowledge is sketchy. A well-connected American think-tank, the Institute for Science and International Security, recently spelled out a long-mooted suspicion. As well as Yongbyon, it said, there seemed to be an older, undisclosed uranium-enrichment site, which it named as Kangsong.

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So diplomats and nuclear scientists take a deep breath as they contemplate the "denuclearisation" of North Korea, an undefined goal reaffirmed at the summit between Kim Jong Un and President Donald Trump on June 12th. In Pyongyang Mike Pompeo, America's secretary of state, is trying to put flesh on those flimsy bones. Even if the two sides can agree on a definition of denuclearisation, it will present bigger challenges than any previous exercise in managed disarmament.

Larger arsenals have been dismantled elsewhere, but in kinder political climates. And well-run programmes have monitored pariah states suspected of coveting the deadliest of weapons. But none involved an arsenal or a nuclear-fuel cycle as lethal, big or elusive as North Korea's. The world has a well-tried set of mechanisms for coping with such situations. They include the NPT and the Vienna-based nuclear inspectorate, the IAEA. These structures would be tested by any

deal with North Korea; but history suggests they can morph in surprising ways if the will exists. …

An Inspector Calls: North Korea, by contrast, already has a dismal history with the IAEA. Its inspectors began working there in 1992, to be thrown out the following year and readmitted a year later. Co-operation ceased in 2009, after multilateral negotiations broke down and North Korea started producing plutonium again. The IAEA's director, Yukiya Amano, says his people stand ready to go back to Pyongyang. But they will need far greater access than they ever enjoyed before if their efforts are to be meaningful.

Under the deal struck in 2015 to curb Iran's nuclear activities, from which America has just pulled out, IAEA inspectors have enjoyed access to the Iranian nuclear cycle of which Korea-watchers only dream. That deal also allows for short-notice inspections; the IAEA says that at least until America's withdrawal, the Iranians were cooperating quite well. But the agreement had noisy critics; some military sites were out of bounds, and it did not touch delivery systems.

During the years of intrusive inspection which followed the 1991 Gulf war in Iraq, the agency also played a vital role. And under the deal struck in 2015 to curb Iran's nuclear activities, from which America has just pulled out, IAEA inspectors have enjoyed access to the Iranian nuclear cycle of which Korea-watchers only dream. That deal also allows for short-notice inspections; the IAEA says that at least until America's withdrawal, the Iranians were cooperating quite well. But the agreement had noisy critics; some military sites were out of bounds, and it did not touch delivery systems, as any deal with North Korea must.

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And there is another snag. The IAEA can trace the flow of nuclear fuel from one facility to another and pinpoint where materials might have been diverted to bomb-making. But once nuclear weapons are made, the Vienna agency bows out. Only the five authorised nuclear states can help dismantle and remove nuclear weapons.

The most ambitious effort of that kind was the destruction and evacuation, after 1991, of parts of the former Soviet nuclear arsenal in Ukraine, Belarus and Kazakhstan. This was an initiative by the world's nuclear giants: America and newly democratic Russia. They agreed that the Soviet arsenal must be slashed and regrouped in Russia. America acquiesced in its monopoly over the Soviet strategic legacy.

Hundreds of long-range missiles and silos were destroyed. The warheads were taken to Russia and neutralised. Uranium was extracted and much of it sold to America. The Soviet system for transporting sensitive materials by rail made this easier. By 1996, the effort was complete; an arsenal of 1,800 warheads was no longer in Ukraine.

Two American senators, Sam Nunn and Richard Lugar, masterminded the legislation which helped neutralise the residual threat from the Soviet WMD: chemical and biological as well as nuclear. Among their best ideas was an initiative to find benign jobs for re-employed weapon scientists. Vice-President Mike Pence conferred last month with Mr Nunn and Mr Lugar. The American-Russian amity that underpinned their work has gone. An obvious partner in any effort to neutralise and evacuate North Korea's nuclear bombs and material would be China.

A less auspicious precedent has also been mentioned as a template for North Korea. The dismantling of Libya's ramshackle nuclear programme (along with chemical weapons and efforts to make biological ones) started in December 2003 and was completed in 2004. Libya's leader, Muammar Qaddafi, craved respectability and sanctions relief. American aircraft carried documents and equipment, including parts of centrifuges and missiles, to a laboratory in Tennessee. But Libya was years away from making any complete bombs. John Bolton, America's national-security adviser, caused consternation in Pyongyang when he suggested in April that Libya might be a useful model. He since added that again, components from a lethal arsenal might be flown to Tennessee.

Nuclear scientists say that airlifting Korean bombs could be acutely risky. Disassembling and transporting nuclear warheads could trigger explosions, albeit probably not nuclear ones. As a minimum it will need close co-operation between the scientists who made them and at least one member of the existing nuclear club.

US President Donald Trump hopes that he will be able to reach an agreement on nuclear proliferation with Russian President Vladimir Putin. The American leader stated this during a joint press conference with British Prime Minister Theresa May in London.

The other reason why talk of Libya horrifies North Korea is the fate of Qaddafi. Overthrown in 2011 with the help of Western air power, he was captured, raped with a bayonet and shot by Western-backed rebels. The pariahs of the world took note. Still, Mr Bolton made clear on July 1st that one aspect, at least, of the Libyan operation was worth copying: its speed. He said Mr Pompeo would be talking to the North Koreans about dismantling all their WMD and ballistic-missile programmes "within a year". Mr Pompeo has mooted a slightly longer timetable: by January 2021.

If "dismantling programmes" means renouncing the capacity for further development, this could indeed be done in a year or two. For example, reactors that produce plutonium could be paralysed; and missile-testing sites destroyed, as Mr Trump (wrongly) claimed was happening already. But verifiably dismantling the existing arsenal and deploying inspectors across all sites would take much longer; Mr Hecker and others have suggested a decade. Mr Bolton's brisk approach leaves some analysts gasping. "If you knew everything they had, if they were fully committed and if you had unlimited resources, something might be achieved quite rapidly," says Tom Plant of RUSI, a London think-tank. "But all those conditions are hypothetical."

Source: https://www.economist.com, 05 July 2018.

NUCLEAR PROLIFERATION

GENERAL

Trump Hopes to Reach Agreement with Putin on Nuclear Proliferation

US President Donald Trump hopes that he will be able to reach an agreement on nuclear proliferation with Russian President Vladimir Putin. The American leader stated this during a joint press conference with British Prime Minister Theresa May in London. In reply to the question about what he hopes to accomplish in meeting with Putin, Trump said the two would be talking about Ukraine, Syria, other parts of the Middle East, nuclear proliferation. "It's a devastating technology. It's a bad policy. [But] We have no choice," Trump concluded. Trump added that he would talk about nuclear proliferation with Putin. "If we can do something to substantially reduce them [nuclear weapons], I mean, ideally get rid of them, maybe that's a dream, but certainly it's a subject that I'll be bringing up with him," Trump stressed.

Source: http://tass.com, 13 July 2018.

NORTH KOREA

North Korea is Continuing to Produce Nuclear Bomb Fuel: Mike Pompeo

North Korea is still making nuclear material, US Secretary of State Mike Pompeo told lawmakers on July 25, six weeks after President Donald

Trump said the nuclear threat from Pyongyang was over. "Yes, they continue to produce fissile material," Pompeo told senators during a closely watched appearance before the Senate Foreign Relations Committee.

Trump met with North Korean leader Kim Jong Un in Singapore on June 12, where the US said Kim had agreed to totally get rid of his nuclear weapons. After the historic summit, Trump tweeted that "there is no longer a Nuclear Threat from North Korea," but in recent days he has faced criticism about the lack of clear progress towards denuclearisation.

Pompeo insisted that "progress is happening" and that Trump is "upbeat about the prospects of North Korean denuclearisation." The top US diplomat said Trump "would agree that the primary systems that have threatened America continue to exist." "I think what his comment was that the tension had been greatly reduced," Pompeo said. Still, he warned, Washington will not let nuclear negotiations with Pyongyang continue indefinitely. "We are engaged in patient diplomacy, but we will not let this drag out to no end," Pompeo said.

Pompeo said he had emphasised this position during "productive" discussions he'd had with Kim Yong Chol, Kim's powerful right-hand man. "Progress is happening. We need Chairman Kim Jong Un to follow through on his commitments made in Singapore." In a sign of potential progress, new satellite imagery shows that Kim has started dismantling a facility seen as a testing ground for intercontinental ballistic missiles. Pompeo added that "every single nation" must maintain enforcement of US sanctions against North Korea. …

Source: https://www.straitstimes.com, 27 July 2018.

NUCLEAR SECURITY

JAPAN

Japan to Deploy Large Patrol Boats to Guard Nuclear Plants

The Japan Coast Guard will deploy two large patrol vessels to areas of the Sea of Japan to reinforce protection of nuclear power plants against terrorism, sources familiar with the matter said. Two new 1,500-ton vessels with helipads will be deployed between fiscal 2019 and 2020 to the coast guard's Tsuruga office in Fukui Prefecture where several nuclear plants are located, according to the sources.

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Patrol boats of similar size, each costing about 6 billion yen ($54 million), will be introduced in other parts of the country in the future, they said. The government is moving to strengthen counterterrorism measures in the run-up to the 2020 Tokyo Olympics and Paralympics, in line with an agreement in February with the International Atomic Energy Agency to bolster Japan's capacity to respond to nuclear terrorism.

The coast guard expects the new ships will also enhance its ability to respond to North Korean boats engaged in illegal fishing, and to unidentified ships sighted off the central Japan coast, the sources said. The new ships could also be used to respond to emergency situations at nuclear plants in other areas, and crew will receive special training in dealing with radioactive substances, they said. An additional 60 to 80 coast guard crew will be posted at the Tsuruga office, nearly doubling the personnel there.

The Tsuruga office belongs to the 8th Regional Coast Guard Headquarters, which is responsible for patrolling waters along a 2,000-kilometer stretch of Japan's central and western coasts. That office operates three patrol boats, the largest being the 350-ton Echizen and to better deal with

China's growing maritime assertiveness, Japan has allocated an initial budget of a record 211.2 billion yen to the Japan Coast Guard for fiscal 2018.

Source: https://mainichi.jp, 22 July 2018.

NUCLEAR SAFETY

EUROPE

Hot Weather Spells Trouble for Nuclear Power Plants

Nuclear power plants in Europe have been forced to cut back electricity production because of warmer-than-usual seawater. Plants in Finland, Sweden and Germany have been affected by a heat wave that has broken records in Scandinavia and the British Isles and exacerbated deadly wildfires along the Mediterranean.

Air temperatures have stubbornly lingered above 90 degrees in many parts of Sweden, Finland and Germany, and water temperatures are abnormally high — 75 degrees or higher in the usually temperate Baltic Sea. That's bad news for nuclear power plants, which rely on seawater to cool reactors.

Air temperatures have stubbornly lingered above 90 degrees in many parts of Sweden, Finland and Germany, and water temperatures are abnormally high — 75 degrees or higher in the usually temperate Baltic Sea. That's bad news for nuclear power plants, which rely on seawater to cool reactors.

Finland's Loviisa power plant, located about 65 miles outside Helsinki, first slightly reduced its output on (25 July) Wednesday. "The situation does not endanger people, [the] environment or the power plant," its operator, the energy company Fortum, wrote in a statement. The seawater has not cooled since then, and the plant continued to reduce its output on both Thursday and Friday (26-27 July), confirmed the plant's chief of operations, Timo Eurasto. "The weather forecast [means] it can continue at least a week. But hopefully not that long," he said.

Eurasto says customers have not been affected by the relatively small reduction in output, because other power plants are satisfying electricity demand. The power plant produced about 10 percent of Finland's electricity last year. The company also cut production at the Loviisa facility in 2010 and 2011, also due to warm water, but Eurasto said this summer's heatwave has been more severe than previous ones.

Nuclear power stations in Sweden and Germany have also reduced production because of cooling problems, Reuters reported. A spokesperson for Sweden's nuclear energy regulator told the wire service that the Forsmark nuclear power plant in Sweden had cut energy production "by a few percentage points."

Cooling issues at nuclear power plants may get worse in the future. Climate change is causing global ocean temperatures to rise and making heat waves more frequent and severe in many parts of the world. A 2011 report by the Union of Concerned Scientists warned that warmer seas could affect the efficiency of nuclear power plants.

Cooling issues at nuclear power plants may get worse in the future. Climate change is causing global ocean temperatures to rise and making heat waves more frequent and severe in many parts of the world. A 2011 report by the Union of Concerned Scientists warned that warmer seas could affect the efficiency of nuclear power plants, noting: "…during times of extreme heat, nuclear power plants operate less efficiently and are dually under the stress of increased electricity demand from air conditioning use. When cooling systems cannot operate, power plants are forced to shut down or reduce output."

It's not just warmer oceans that could spell trouble for nuclear power plants. Climate change is also producing more powerful storms and contributing to drought conditions, threatening facilities on coasts with wave and wind damage, and reducing the amount of water available to plants that cool

their reactors with fresh water.

Source: Rebecca Hersher, https://wamu.org/story/18/07/27/hot-weather-spells-trouble-for-nuclear-power-plants/, 27 July 2018.

GENERAL

Drafting and Revising Nuclear Safety Regulations in Focus at IAEA School

Regulatory staff from nine countries sharpened their ability to draft and revise regulations in line with the IAEA safety standards during a 10-day course held in June in Vienna. During the 7th IAEA School on Drafting Nuclear Safety Regulations held from 4 to 14 June 2018, participants learned how to draft and review regulations using the IAEA safety standards as a basis.

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As noted in several IAEA safety standards, including the General Safety Requirement titled Governmental, Legal and Regulatory Framework for Safety (No. GSR Part 1 Rev.1), an up-to-date set of regulations underpins national regulatory frameworks for nuclear safety and the regulatory body's judgements, decisions and regulatory actions. The School, held annually, forms part of IAEA support to Member States to strengthen their capacity to develop and review regulations for the implementation of national laws on safety. This year, the focus was regulations related to management for safety and operational safety.

The 19 participants from Armenia, Belarus, Bulgaria, Hungary, Iran, Poland, Romania, Slovakia and Ukraine, supported and guided by international experts, analysed how their national regulations align with IAEA safety standards. The participants are from countries which are using or considering using nuclear power, also drafted and revised regulation proposals to fix possible gaps. …

Source: https://www.iaea.org, 03 July 2018.

USA

Uranium Leaked at S. Carolina Nuclear Fuel Plant

Radioactive uranium leaked through the floor of a nuclear fuel plant in South Carolina but state health officials say they don't think the material has threatened water supplies. The material leaked through a 3-inch (8-centimeter) hole in the concrete floor where acid is used at the Westinghouse plant south of Columbia, according to the Nuclear Regulatory Commission.

The NRC learned of the leak July 12 and said the hole is 6 feet (2 meters) deep, according to records obtained by *The State* newspaper. There is no reason to think the uranium has moved away from the plant or threatens water supplies because there are no private homes downstream of the plant and no public water supply wells within 2 miles (3 kilometers) of the hole, according to the state Department of Health and Environmental Control.

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But the agency is awaiting groundwater tests on the Westinghouse property, spokesman Tommy Crosby said. "Based on existing information, there is no threat to the public from this recent release or from historical groundwater contamination at this secured site as there is no exposure risk to the general public," Crosby said in an email to the newspaper.

The uranium in the soil near the hole reached 4,000 parts per million, according to federal records, which is 1,300 times greater than normal. Westinghouse and the federal government need to explain how long uranium was leaking through the hole into the soil, said Tom Clements, an anti-nuclear activist. "It's a pretty big concern if you have an unknown quantity of material containing uranium leaching into the groundwater," Clements said.

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The plant uses uranium to make the fuel rods for commercial nuclear reactors. The company covered the hole in the floor with a metal plate and isn't using the chemical-processing equipment in the area until the hole is repaired, Westinghouse spokeswoman Sarah Cassella said in an email. Westinghouse had to shut down part of the plant 10 miles (16km) southeast of downtown Columbia two years ago when uranium built up in an air pollution device and was cited by federal regulators earlier this year for not having proper procedures in place to limit a burst of radiation. The company has brought in new management and pledged to be more safety conscious. …

Source: https://abcnews.go.com, 25 July 2018.

NUCLEAR WASTE MANAGEMENT

CANADA

NWMO Issues Reconciliation Statement Collaboratively

The Nuclear Waste Management Organization (NWMO) is taking a significant step towards reconciliation by acknowledging historical wrongs in Canada's past and the need to create a better future by addressing the challenges of today. This acknowledgment forms part of the NWMO's Reconciliation Statement, which was finalized through an Indigenous ceremony. Members of the Council of Elders and Youth, NWMO Board of Directors and senior leadership took part in a Pipe Ceremony led by Elder Fred Kelly and in a traditional gift exchange.

"We are privileged to have many Indigenous voices – on the Council of Elders and Youth, in the communities with which we work, on our Board of Directors, and on our staff – guiding us in our journey towards reconciliation," said Laurie Swami, President and CEO of the NWMO. "Together, we are thinking deeply about reconciliation and have formed a statement that will give our approach meaning and direction."

Building on the statement, the NWMO is now working on a Reconciliation Policy. The policy will include an implementation strategy to measure annually the organization's progress and commitment to Indigenous peoples and their history and future. In the context of reconciliation, NWMO recognizes historical wrongs in Canada's past and the need to create a better future by addressing the challenges of today.

The statement recognizes the NWMO's ongoing involvement, collaboration and discussions with Indigenous (First Nation and Métis) communities and all those involved with implementing Canada's plan for the long-term management of used nuclear fuel. It is also part of the NWMO's response to calls to action by the Truth and Reconciliation Commission of Canada in 2015. It is the organization's initial response to Section 92, which calls for the corporate sector to build respectful relationships with Indigenous peoples, and provide education for management and staff on the history of Indigenous peoples, including the history and legacy of residential schools. …

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NWMO recognizes historical wrongs in Canada's past and the need to create a better future by addressing the challenges of today. The NWMO Council of Elders and Youth speaks of this journey as a new era for humanity – a time of reconciliation with First Nation, Métis and Inuit peoples.

The NWMO is committed to contribute to reconciliation in all its work by co-creating a shared future built on rights, equity and well-being. In addition, the NWMO will establish a Reconciliation Policy with an implementation strategy that will be measured annually and publicly reported to contribute to the Truth and Reconciliation Commission's calls to action.

The NWMO's acknowledgment and commitment to a new policy builds on a strong foundation of interweaving Indigenous Knowledge into decision-making. Since its inception in 2002, the NWMO has worked hard to engage respectfully with Indigenous communities. The organization continually seeks and receives advice from the Council of Elders and Youth.

The NWMO's Aboriginal Policy and Indigenous Knowledge Policy, adopted in 2009 and 2016 respectively, provide guidance and inform its work. …In addition, all NWMO staff and contractors receive training in Indigenous cultural awareness, and important corporate occasions and milestones are celebrated through ceremony, an approach consistent with the finalization of the Reconciliation Statement. …

Source: Nuclear Waste Management Organization, 18 July 2018.

USA

USR Ordered to Clean Up Nuclear Waste Stored in Denton

A state health official has ordered US Radiopharmaceuticals to clean up the nuclear waste it has been storing in Denton for a decade. The July 16 order from the Texas Department of State Health Services follows years of bureaucratic wrangling between the state and USR. But the order is significant because it starts the clock.

USR has until August 2019 to decommission its plants on Shady Oaks Drive and on Jim Christal Road. The company has two opportunities to stop the clock — one with the state agency and another in district court. Both, however, are akin to a long-shot Hail Mary pass. The manufacturing plants have been closed since 2009. USR's Denton attorney, Adam Whitten, declined to comment. The state agency, through its spokesman Chris Van Deusen, also declined to comment.

Before USR owned the property and the business, Trace Life Sciences manufactured medical radioisotopes for diagnosing disease and tnreating cancer in Denton. Trace closed the plants after the company's financial backers went into federal receivership. A Utah company, NuView Life Sciences, and its president, Paul Crowe, plucked the properties out of receivership and created USR — a wholly owned subsidiary of NuView — to try to restart the business.

The linear accelerator — equipment built by Los Alamos National Laboratory originally for Texas' failed Superconductor Super Collider project — likely will cost the most to clean up. It sits idle in a concrete tunnel underground. State inspectors visit the sites regularly and have found no elevated levels of outside radiation.

In 2012, USR formally applied to the Texas Department of State Health Services for a new manufacturing license. Crowe sought investors to reopen the plant. The new license application required USR to have enough money (or special insurance, as an alternative) to be able to clean up the radioactive waste when the time came. To date, USR has not been able to raise the capital to reopen.

In the meantime, state officials allowed USR to store the low-level radioactive waste in drums at the Shady Oaks plant. The equipment used to make the radioisotopes both on Shady Oaks and on Jim Christal Road is also radioactive, posing no threat to the surrounding area for the time being.

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a concrete tunnel underground. State inspectors visit the sites regularly and have found no elevated levels of outside radiation.

During a special hearing in February with a state administrative law judge, USR and state health officials estimated it will cost between $2 million and $2.5 million to clean the radioactive waste stored in Denton. If USR fails to meet the deadline for cleanup, the job falls to state health officials and taxpayers. Texas has a dedicated fund to clean up low-level radioactive waste. A report on the status of that fund, which had about $27 million a year ago, is due from the Texas comptroller's office in August.

State law also give the Texas Department of State Health Services the authority to try to recover those costs from the property owners. Denton city spokeswoman Jessica Rogers said in an email that city leaders are continuing to follow the case, knowing options remain for both the state agency and USR. "We are interested in seeing what the next steps are moving forward," she said.

Source: Peggy Heinkel-Wolfe, https:// www.dentonrc. com, 28 July 2018.

Centre for Air Power Studies

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