



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

Vol 12, No. 15, 01 JUNE 2018

## OPINION – Harsh V. Pant

### India's Nuclear Policy

This month marks two decades since India crossed the nuclear rubicon in 1998 and declared itself as a de facto nuclear weapon state. It has been a long journey since then and the US India civil nuclear deal was the culmination, making India part of the global nuclear architecture and its integration into the global nuclear order. But as New Delhi works towards entering the Nuclear Suppliers Group and recalibrates its deterrence vis-à-vis China and Pakistan, debates continue about the future of India as a nuclear power.

A crude nuclear stability has emerged in South Asia as India's calibrated responses to the three major region crises since May 1998 demonstrate.

Nuclear weapons have contributed to regional strategic stability by reducing the risk of full scale war in the region. Despite repeated provocations by Pakistan – in 1999, 2001-02 and 2008 and a resentful Indian public that wanted its government to retaliate, the Indian policymakers demonstrated an extraordinary measure of restraint in the aftermath of all three crises, refusing to launch even small-scale limited attacks against Pakistan. The Indian government forbade the military to cross the Line

**A crude nuclear stability has emerged in South Asia as India's calibrated responses to the three major region crises since May 1998 demonstrate. Nuclear weapons have contributed to regional strategic stability by reducing the risk of full scale war in the region. Despite repeated provocations by Pakistan – in 1999, 2001-02 and 2008 and a resentful Indian public that wanted its government to retaliate, the Indian policymakers demonstrated an extraordinary measure of restraint.**

	<u>CONTENTS</u>
☞	OPINION
☞	NUCLEAR STRATEGY
☞	BALLISTIC MISSILE DEFENCE
☞	NUCLEAR ENERGY
☞	NUCLEAR COOPERATION
☞	NUCLEAR DISARMAMENT
☞	URANIUM PRODUCTION
☞	NUCLEAR NON-PROLIFERATION
☞	NUCLEAR PROLIFERATION
☞	NUCLEAR SAFETY
☞	NUCLEAR WASTE MANAGEMENT

of Control despite the Indian military officials clearly wanting to pursue such a posture.

In 2016, the Modi government changed that when the Indian Army's special forces took out several suspected terror camps across the volatile Line of Control in Kashmir in response to an attack on an Indian army post in Kashmir by Pakistan-based terrorists that killed 20 soldiers. The Indian response came almost 11 days after the initial attack and reflected an attempt by the Modi government to pressurize Pakistan on multiple fronts, thereby gaining leverage over an adversary that had long used terrorism and

proxies to challenge India. The Modi government decided to use the instrumentality of military power — a tool which New Delhi had avoided for long. What was new about was not that cross-border raids took place, but that India decided to publicize them to the extent it did.

Pakistan's reaction was contradictory. While the nation's military issued a flat denial of Indian claims and insisted that only cross-LoC firing had taken place, Pakistani Prime Minister Nawaz Sharif decried India's "naked aggression," and suggested that India's move had exacerbated the civil-military divide in the country. With its move, India did not discard strategic restraint, contrary to what many have suggested, but managed to reset the terms of military engagement with Pakistan. For years now, Pakistan had raised the bogey of nuclear weapons to put India in a state of strategic limbo. After the Uri attacks, Pakistan's defence minister, Khawaja Muhammad Asif, had waved the nuclear saber and threatened to "annihilate" India if attacked.

But with its strikes, India has managed to convey to Pakistan and to other external stakeholders that Pakistan's nuclear blackmail has no legs to stand on and that India has military room to operate below the threshold that would trigger major conventional, or even nuclear, escalation. India is also trying to shape a counter narrative about the ability of India to inflict pain on Pakistan. By constantly deciding not to react militarily to Pakistani provocations, New Delhi was losing its deterrence credibility, further fueling Pakistan's adventurism.

Indian policymakers cutting across the ideological spectrum have been trying to grapple with Pakistan's adventurous foreign policy for years now. In fact, former National Security Advisor Shiv Shankar Menon's book talks of Pakistan's nuclear

shield permitting it to undertake terrorist attacks on India without fear of retaliation, a key variable that is resulting in new ways of looking at India's posture.

Though the BJP-led government has so far not proposed any change in the doctrine or the NFU on which India's declaratory nuclear doctrine is based, it had promised in its 2014 election manifesto to "study in detail India's nuclear doctrine, and revise and update it, to make it relevant to challenges of current times." Manohar

Parrikar, India's defence minister till early 2017, has questioned India's NFU policy on nuclear weapons, asking, "Why a lot of people say that India has No First Use policy... I should say I am a responsible nuclear power and I will not use it irresponsibly... And as an individual, I get a feeling sometime why do I say that I am not going to use it first. I am not saying that you have to use it first just because you don't decide

that you don't use it first. The hoax can be called off."

But what really set the cat among the pigeons is a passage in a recent book by India's former national security advisor, Shiv Shankar Menon, wherein he writes: "There is a potential grey area as to when India would use nuclear weapons first against another NWS. Circumstances are conceivable in which India might find it useful to strike first, for instance, against an NWS that had declared it would certainly use its weapons, and if India were certain that adversary's launch was imminent."

This has led some to argue that there is a major doctrinal shift happening in India whereby New Delhi may abandon its NFU nuclear policy and launch a pre-emptive strike against Pakistan if it feared that Islamabad was likely to use the weapons first. This is being viewed by many in the West as a seismic shift in India's nuclear

**With its strikes, India has managed to convey to Pakistan and to other external stakeholders that Pakistan's nuclear blackmail has no legs to stand on and that India has military room to operate below the threshold that would trigger major conventional, or even nuclear, escalation. India is also trying to shape a counter narrative about the ability of India to inflict pain on Pakistan. By constantly deciding not to react militarily to Pakistani provocations, New Delhi was losing its deterrence credibility, further fueling Pakistan's adventurism.**

posture, one which may have significant consequences for South Asian strategic stability.

As we complete twenty years since Pokhran II, it is certainly time to reassess Indian nuclear policy and posture. Indian nuclear doctrine was articulated in 1999 and it certainly needs to be reviewed. All doctrines require regular reappraisals and Indian nuclear doctrine will inevitably have to respond to contemporary challenges. New Delhi should not shy away from this debate.

Source: <https://www.orfonline.org/research/indias-nuclear-policy/>, 28 May 2018.

**OPINION – Peter Jenkins**

**The JCPOA, the NAM, the NNWS, the USA, and the NPT**

It was asked that how President Trump's decision to pull the US out of the July 2015 nuclear deal with Iran would affect the nuclear non-proliferation regime centred on the NPT. One way of approaching the question is to try to imagine what impression the President's decision will have made on the bulk of NPT parties: the NNWS who are members of the NAM.

This large group (almost two-thirds of all NPT parties) will realize that President Trump had several motives for ditching the Joint Comprehensive Plan of Action (JCPOA), such as undoing an Obama achievement, pleasing Israel and Saudi Arabia, and creating an opportunity for himself to demonstrate his mastery of the art of the deal. But they will focus especially on the President's oft-repeated ambition to "fix the flaws" that he perceives in the JCPOA. Principal among those flaws, to judge from the President's statements, is that fact that from 2031 Iran will be free to deploy more advanced centrifuges for enriching uranium than those it deployed between 2006 and 2013, to install as many of those advanced machines as it chooses, and to stock as

**From 2031 Iran will be free to deploy more advanced centrifuges for enriching uranium than those it deployed between 2006 and 2013, to install as many of those advanced machines as it chooses, and to stock as much low-enriched uranium as it wishes. Cumulatively those freedoms could give Iran the ability to produce enough highly enriched (weapons-grade) uranium for a weapon within a very low number of weeks.**

much low-enriched uranium as it wishes. Cumulatively those freedoms could give Iran the ability to produce enough highly enriched (weapons-grade) uranium for a weapon within a very low number of weeks, were it to decide to "break out" of its nuclear non-proliferation commitments.

A newcomer to this field might suppose that NAM parties to the NPT would agree with the President that this prospect is alarming and that a fix is needed. In reality those states are more likely to reflect on what the President's position implies for their sovereign right to make use of nuclear technology for peaceful purposes under IAEA safeguards. In essence, they will reason, the President is objecting *a priori* to a NAM member, Iran, exercising one of its sovereign rights, the enrichment of uranium in accordance with the NPT.

These states won't like that, because they will think of it as a threat to their own sovereign rights. Most of them are very unlikely ever to see advantage in exercising their sovereign right to enrich uranium for peaceful purposes, but they will see the point that the president has raised as one of principle. In their eyes, it will be the United States that has no right to decree that other states may not

exercise such rights, especially as over the years the United States has displayed a tendency to try to lay down the law with a remarkable lack of consistency and impartiality.

This NAM view will be influenced by a weakness in the President's position. He is assuming that Iran is intent on eventually acquiring nuclear weapons and that Iran will move to do so as soon as the current restrictions lapse on uranium enrichment, a technology that has potential for both civil and military use. Not only is this assumption currently unsupported by evidence, it runs counter to Iran's multiple nuclear non-proliferation pledges, and to all the reasons there

are to believe that only in the most exceptional circumstances might it ever be in Iran's interest to try to become nuclear-armed. In other words, at this juncture there is no good reason for the international community, through the UNSC or in any other way, to deprive Iran of its sovereign rights in the nuclear field.

**Related influences on NAM reactions to the claim that flaws must be fixed probably include the following:**

- Well before 2031, the IAEA is due to report the outcome of its meticulous examination of Iran's nuclear program. The access that the IAEA enjoys under the JCPOA and the "additional protocol" to

**Iran intends after 2031 that its nuclear fuel needs will determine the amount of LEU it produces. As a confidence-building measure, Iran will aim to avoid having significant quantities of LEU available for rapid processing to the level required for weapons.**

Iran's NPT safeguards agreement with the IAEA will enable it to assess with a high degree of confidence whether or not Iran has declared all of the nuclear activity and material on Iranian soil. That assessment ought to be a crucial determinant of whether the JCPOA needs to be extended or otherwise "fixed," not unfounded and subjective assumptions about how Iran intends to behave after 2031.

- According to Iranian ministers and diplomats, Iran intends after 2031 that its nuclear fuel needs will determine the amount of LEU it produces. As a confidence-building measure, Iran will aim to avoid having significant quantities of LEU available for rapid processing to the level required for weapons.

- Signs indicate that the Trump administration intends to ignore the US commitment, under Article VI of the NPT, to move towards a nuclear weapon-free world. Moreover the US has attacked the July 2017 Nuclear Ban Treaty and has continued to shield Israel from pressure to negotiate a nuclear-weapons-free zone in the Middle East. These failings do not endear the United States to the NAM.

- Iran may be open to other confidence-building measures as 2031 approaches: forming a joint venture with foreign firms to manage Iran's

nuclear fuel cycle needs, for example, and creating a mutual safeguarding agency with Turkey, on a model offered by Argentina and Brazil (in addition to IAEA safeguards).

All of this suggests that President Trump's decision has not enhanced the NPT standing of the US. The President's readiness to withdraw from a valid agreement without good cause will have heightened distrust of the US commitment to a rules-based order. Fortunately, that is more likely to result in a decline in US influence at the next NPT Review Conference in 2020 than in defections from the NPT regime. It is to be regretted nonetheless.

Source: <https://lobelog.com>, 22 May 2018.

**OPINION – Alyn Ware**

**Nuclear Weapon States' Long Arm Seen Behind Deferral of Landmark UN Conference**

May 14, 2018 was supposed to see the opening at the UN of a three-day High-Level Conference on Nuclear Disarmament, scheduled to discuss "effective nuclear disarmament measures to achieve the total elimination of nuclear weapons, including, in particular, on a comprehensive convention on nuclear weapons." The UN General Assembly decided five years ago to hold such a conference in 2018, following a series of annual, one-day, high-level meetings at the UN.

The importance of the 2018 High-Level Conference only increased during these five years with a range of nuclear-weapons related conflicts heating up – Russia vs. NATO, North Korea vs. USA, India vs. Pakistan – to such an extent that the Bulletin of the Atomic Scientists in January 2018 moved the hands of the Doomsday Clock to 2 Minutes to Midnight. This is the closest humanity has been to nuclear Armageddon since the Cuban Missile Crisis in 1962.

Uncertainty over the future of the Iran nuclear deal following the withdrawal of the US on May 8 has

only added fuel to the nuclear fire. A High-Level Conference (scheduled for May 14-16) would have provided a powerful platform for world leaders to support diplomacy and nuclear-risk reduction in these nuclear-related conflicts, as well as to advance nuclear disarmament measures such as the *Treaty on the Prohibition of Nuclear Weapons* which was concluded by non-nuclear States at the UN in July 2017 but has not yet entered into force. Right at a time when such a conference is needed the most, it has surprisingly been postponed to an uncertain future date.

Civil society representatives, many of whom had

already booked their flights to New York for the conference, were left perplexed. The High-Level Conference had been initiated by the 120-nation NAM, which in the past has led on a number of nuclear disarmament initiatives, such as challenging the legality of the threat and use of nuclear weapons in the ICJ in 1994. Many of the

Non-Aligned countries were also active in the 2017 negotiations that concluded the *Treaty on the Prohibition of Nuclear Weapons*. So why NAM would now reverse itself and drop such an important event? The Indonesian Mission (Embassy) to the UN, which serves as the UN Coordinator for NAM, indicated that they had not found a suitable country to chair the conference. This indeed appears to be true. Several candidates invited to chair the conference had declined. But this still begs the question why? Wouldn't one or more of the NAM countries want to chair the conference and elevate their standing in the international community as a broker for peace and disarmament? It appears from informal conversations with some NAM members that there are deeper reasons, most of which fall back to the long-arm influence and intransigence of nuclear-armed States on nuclear issues. This plays out in a number of ways.

Firstly, it appears that the NAM was unsuccessful

in persuading leaders of nuclear-armed and allied states to commit to coming to the UN High-Level Conference. Having a conference where these states are represented only at ambassador level (or even lower) would undermine the conference and would limit the degree to which these countries would commit to any nuclear risk-reduction or disarmament measures. This argument would be totally understandable if the NAM had indeed put strong pressure and invested political capital to move the leaders of nuclear armed and allied states to come. But this did not seem to be the case. Leaders of countries are not

moved to come to UN Summits or High-Level Conferences solely on the basis of a UN resolution. They would be so moved if NAM leaders announced that they themselves were coming to the UN conference at the highest level (President or Prime Minister), publicly called on the nuclear armed and allied states to do the same and made this a priority in

their bilateral meetings with the leaders of the nuclear armed and allied States. The fact that NAM did not appear to do this indicates that something else is happening within NAM that appears to have reduced their collective resolve and impact on nuclear disarmament issues.

Indeed, since the end of the Cold War, a number of NAM members, like many other non-nuclear States, have developed closer trade, financial and political relationships with specific nuclear-armed States. They appear hesitant to do anything that would seriously impact on such relationships. These countries are ready to support nuclear disarmament statements and resolutions that look good but have little impact on their nuclear-armed friends. They are hesitant to adopt measures that might impact significantly on the practices of the nuclear-armed states and incur the wrath or even counter measures from them.

This was evident, for example, in the negotiations

**It appears that the NAM was unsuccessful in persuading leaders of nuclear-armed and allied states to commit to coming to the UN High-Level Conference. Having a conference where these states are represented only at ambassador level (or even lower) would undermine the conference and would limit the degree to which these countries would commit to any nuclear risk-reduction or disarmament measures.**

of the *Treaty on the Prohibition of Nuclear Weapons*. The nuclear-armed States and the allied states under extended nuclear deterrence relationships have all indicated that they won't join the Treaty which means that the general Treaty obligations will not apply to them. However, there were proposals to include Treaty provisions that would have had direct impact on practices of the nuclear-armed States. These included prohibiting transit of nuclear weapons in the land, sea and air spaces of Treaty parties, and to ban financing of nuclear weapons, i.e. investments in nuclear weapons corporations. The fact that the states negotiating the Treaty rejected these proposals demonstrated their unwillingness to confront the nuclear-armed States.

This was also evident in the recent case taken by the Marshall Islands against nuclear-armed States in the ICJ. This was a direct legal challenge of the nuclear-armed States violating their nuclear disarmament obligations. However, not one other non-nuclear country joined the Marshall Islands in the case. None wanted to come into direct confrontation with the nuclear-armed States. As a result, the ICJ determined

**Not one other non-nuclear country joined the Marshall Islands in the case. None wanted to come into direct confrontation with the nuclear-armed States. As a result, the ICJ determined that it was not a real legal dispute regarding the disarmament obligation, and they dismissed the case. It appears that this low level of resolve by NAM and other non-nuclear States to confront the nuclear-armed States is not the only reason for the deferral of the UN High-Level Conference.**

that it was not a real legal dispute regarding the disarmament obligation, and they dismissed the case. It appears that this low level of resolve by NAM and other non-nuclear States to confront the nuclear-armed States is not the only reason for the deferral of the UN High-Level Conference.

Another reason appears to be that the heightened tensions between nuclear-armed States make it difficult for even the strongest disarmament advocates and the best 'bridge-builders' to succeed in bringing the nuclear-armed States together to cooperate in such a forum. An indication of this is the responses of the nuclear-armed States to two recent initiatives by Kazakhstan, a country that had been incredibly influential and successful as a bridge-builder at the end of the Cold War. Kazakhstan was instrumental in bringing Russia and the US

together in 1991 to cooperate on nuclear threat reduction, the dismantling of the nuclear weapons in Kazakhstan, Ukraine and Belarus and the securing of nuclear materials in these countries. However, two of Kazakhstan's more recent attempts to encourage cooperation between nuclear-armed States (and especially US and Russia) have had much less success. These included the Universal Declaration for a Nuclear Weapon-Free World, which did not get unanimous support, and the Security Council session on confidence building and weapons of mass destruction which Kazakhstan President Nazarbayev chaired on January 18, 2018.

The U.S. used the opportunity of the Security Council session not to discuss confidence-building measures, but rather to launch a multifaceted attack against Russia. Russia then responded in kind. This, and other indications of increased antagonism between nuclear-armed States, appears to have convinced some NAM countries that now was not an optimum time to hold the High-Level Conference. On the other hand, it is understood that other NAM countries believed that this

dynamic and other tensions and conflicts such as in North-East Asia, were the very reason that a High-Level Conference would be so important at this time. Many civil society organizations share the latter view. *"If ever there was a time when there was a need for a high-level summit ... it is now,"* said Jackie Cabasso, executive director of Western States Legal Foundation, on March 28.

*"One of the things I think we're here to say is that this opportunity should be seized upon by the nuclear powers which are confronting each other now in a very, very dangerous way that threatens all of us,"* continued Cabasso. *"This high-level conference could provide support and encouragement especially as it comes between the planned summit between the two Koreas in April and the U.S.-North Korea summit in May/June."*

There is concern that the postponing of the UN High-Level Conference might be a sign of ‘wet feet’ from the NAM leading to it being cancelled altogether. *“NAM needs to hear from civil society and from other non-nuclear governments that the High-Level Conference must proceed, either later in 2018 or in 2019,”* says John Hallam, Convener of the Abolition 2000 Nuclear Risk Reduction Working group.

*“The threats to humanity and the planet from the conflicts and policies of the nuclear armed States are too high, too risky, and too important to leave to them alone. The High-Level Conference is vital to pull them back from the nuclear abyss and set the world on a path to nuclear disarmament,”* he adds.

Civil society action has been successful in the past in re-building the resolve of NAM to take action in the face of strong opposition from the nuclear-armed States. In 1993, as a result of pressure from the nuclear-armed States, the NAM withdrew their resolution to the UN requesting the ICJ to rule on the illegality of the threat or use of nuclear weapons. At that time, it appeared as though the initiative was lost. However, a coalition of over 700 civil society organizations took action and convinced the NAM to resist the pressure from the nuclear-armed States and to re-submit the resolution to the UNGA in 1994. The result was a successful vote in the UNGA, followed by an historical case where the court affirmed the general illegality of the threat and use of nuclear weapons and the universal obligation to achieve nuclear disarmament. A similar campaign by civil society in support of the UN High-Level Conference could

**A coalition of over 700 civil society organizations took action and convinced the NAM to resist the pressure from the nuclear-armed States and to re-submit the resolution to the UNGA in 1994. The result was a successful vote in the UNGA, followed by an historical case where the court affirmed the general illegality of the threat and use of nuclear weapons and the universal obligation to achieve nuclear disarmament.**

**The main element of change has occurred on the diplomatic front, where Moon’s engagement policy has facilitated the remarkable inter-Korean rapprochement of recent months. Despite having reneged on a number of his electoral promises regarding Pyongyang, the overwhelming success of Moon’s diplomatic strategy has ensured that his approval ratings have remained exceedingly high—and now hover at around 85%.**

convince NAM to move the UN General Assembly this October to re-schedule the UN High-Level Conference for 2019. Civil society organizations are meeting in New York to discuss the issue.

Source: <https://www.indepthnews.net>, 14 May 2018.

**OPINION – Lauren Richardson**

**Shifts in South Korea’s Approach to North Korea**

South Korean President Moon Jae in has just completed his first year in office, and what an eventful year it has been. Over the past 12 months, the world watched tensions surrounding Pyongyang’s nuclear weapon program take the Korean peninsula to the brink of war. And then, just as strikingly, we beheld a sharp de-escalation of those tensions, culminating in great strides toward inter-Korean reconciliation. What explains this stunning

turnaround? Did President Moon’s North Korea policy diverge drastically from that of his disgraced predecessor, Park Geun hye?

Indeed, Moon had pledged to reverse many of Park’s policies in his electoral campaign. In author’s opinion Moon’s North Korea policy has in fact been marked more by its continuity with that of Park than it has been by change—particularly in the defensive realm. The main element of change has occurred on the diplomatic front, where Moon’s engagement policy has facilitated the remarkable Korean rapprochement of recent months. Despite having reneged on a number of his electoral promises regarding Pyongyang, the overwhelming success of Moon’s

diplomatic strategy has ensured that his approval ratings have remained exceedingly high—and now hover at around 85%.

In Moon's electoral campaign, he promised a new approach to dealing with North Korea. Departing from Park's stratagem of isolating Pyongyang, Moon harked back to the 'Sunshine Policy', emphasising dialogue and engagement. He pledged to reconsider the installation of the American THAAD system—intended to intercept North Korean missiles—and expressed a will to pursue greater autonomy for South Korea within the confines of the US alliance. He also expressed a will to refrain from trilateral defence exercises with the US and Japan.

However, as North Korea's nuclear and missile capabilities rapidly increased, Moon was steered down a more pragmatic and centrist policy line on all fronts except that of diplomatic engagement. Indeed, Moon had every intention of eschewing the controversial THAAD anti-missile system. Yet as North Korea successfully launched successive ICBMs on 4 and 28 July—demonstrating a newly acquired capability to strike the US mainland—President Moon felt compelled to fully deploy and operationalise the system. Although he stressed that this was a temporary arrangement, an announcement from the North a mere two months later served to consolidate the THAAD deployment: Pyongyang's official mouthpiece—KCNA—reported that North Korea had successfully tested a hydrogen bomb intended to be mounted on an ICBM.

Moreover, despite Moon's expressed desire to pursue greater independence for Seoul within the bounds of the US alliance, the North Korean nuclear problem necessitated a realignment in the alliance towards greater cooperation, rather than increased autonomy for Seoul. Moon had little option but to go into damage control on the alliance front and work to strengthen the US–South Korean bilateral defence posture. Trump's visit to Seoul in November 2017 provided an

opportune forum for this realignment, with Moon expressing his support for the US led UN sanctions on Pyongyang, affirming that denuclearisation was the priority, and concurring that a combination of pressure and engagement was the best way to proceed. The Trump–Moon summit culminated in a joint statement emphasising the commitment of both countries to further squeeze Pyongyang, including the prospect of a new round of sanctions.

As a corollary of this realignment, under the Moon administration there has been a strengthening of trilateral defence cooperation between South Korea, Japan and their mutual ally, the US. This has occurred in spite of Moon taking a hardline stance against Tokyo during his presidential bid. As the threat emanating from North Korea continued to

escalate following his election, Moon proceeded to enhance trilateral defence cooperation through intelligence sharing and joint military exercises. Those initiatives were aimed at improving the allies' capacity to launch coordinated responses to Pyongyang's provocations. The element of Moon's North Korea policy that has aligned most closely with his electoral campaign has been his openness to diplomatic engagement. Moon's willingness to accept Kim Jong un's proposal for

joint participation in the Winter Olympics triggered a series of diplomatic advancements in Seoul–Pyongyang relations. That culminated in the mutual decision to convene an inter-Korean summit—the first in over a decade. Seoul capitalised on that stunning diplomatic achievement to broker an agreement between Trump and Kim to conduct a US–North Korean summit, now scheduled to take place in Singapore on 12 June.

The main diplomatic challenge that lies ahead for Moon is ensuring that Trump's North Korea policy remains in harmony with his own. While it's feasible that Moon would concede to an incremental denuclearisation of the peninsula, Trump will likely be intent on securing short-term gains on this front. We can also expect that Trump would be more inclined to walk away from a denuclearisation deal

**The main diplomatic challenge that lies ahead for Moon is ensuring that Trump's North Korea policy remains in harmony with his own. While it's feasible that Moon would concede to an incremental denuclearisation of the peninsula, Trump will likely be intent on securing short-term gains on this front. We can also expect that Trump would be more inclined to walk away from a denuclearisation deal with Pyongyang if the terms of the agreement are not implemented expediently.**

with Pyongyang if the terms of the agreement are not implemented expediently.

Source: <https://www.aspistrategist.org.au>, 15 May 2018.

**OPINION – Ehud Ein-Gil**

**Netanyahu, How Many People Will Die in a Nuclear War in the Middle East?**

With the Iran nuclear deal on the rocks and tensions rising across the Middle East, it is worth revisiting a question that was posed more than two decades ago by Daniel Ellsberg, the former US military analyst who leaked the Pentagon Papers, about the potential cost in lives of nuclear warfare in this region.

In October 1996, Ellsberg took part in a conference in Tel Aviv entitled “Democracy, Human Rights and Mordechai Vanunu,” dedicated to the jailed Israeli nuclear whistleblower and led by Prof. Joseph Rotblat, winner of the 1995 Nobel Peace Prize. The conference was organized by the Israeli Committee for Vanunu and for a Middle East Free of Nuclear, Biological and Chemical Weapons. All the conference speeches were included in a book called “Vanunu and the Bomb” (edited by Giora Neumann and myself), which was published in 1998.

Here is an excerpt from Ellsberg’s 1996 speech, in which he drew on his Cold War experience in making plans for nuclear conflict and expected casualty figures. “In 1961 I drafted a question for the president, John [F.] Kennedy, to ask the joint Chiefs of Staff. I was in the process of drafting the guidance notes for the operating plans for general nuclear war. I wrote a 20-page top secret draft adopted totally by [then-Defense Secretary Robert] McNamara and sent by him, as the secret guidance for joint Chiefs of Staff for totally changing the Eisenhower war plans. I was very proud of that as I thought the current plans to be a disaster and my plans were far better. (I can still say they were better but not as much as I had thought: I bear that on my conscience.) Therefore, it was possible to draft questions to the High Chief, which he accepted, one of which was: If your plans were executed, and not interrupted by typhoon, pre-emptive attack or total incompetence, how many

people would have died in the Soviet Union and China?

“I asked that in the belief that they did not have an answer. I had been working with the planners in the air force, who had never done such calculations. I thought they would have to waffle, it would be very embarrassing, or they would give some absurdly low estimate. But they did have an answer. It was addressed ‘for the eyes of the president only,’ but as I wrote the question, I saw that I held in my hand an unusual piece of paper.

“The number was for people in the Soviet Union and China alone, so they could avoid undue delay. It was a simple graph. An ascending line starting with deaths on the first day and leading on to deaths from fallout and so on in six months’ time. The figure was 320,000,000 dead. So they knew what their plans entailed. Obviously a computer model had done the calculations.

“So I asked about the rest, the answer was about 100,000,000 in Western Europe and roughly the same in Eastern Europe. Neutral countries adjacent to the Soviet Union, non-aligned; Afghanistan, Austria, Japan, were wiped out by fallout from our attacks, without calculations from retaliation from first strike. “Total body count over the next couple of weeks was 600,000,000. I asked myself how people I drank beer with and worked with every day, could have written such plans. Not just hypothetical ones, this was a targeting estimate for planes on instant 10-minute alert all over the world; missiles, submarines, and machinery which was already there, not 10 years in the future. This was next week.

“This is what would have happened had we gone to war over Cuba, which was possible in 1962, or Berlin in 1960. 600,000,000 people. I thought they were the most evil plans that had ever been made in the history of humanity. I have spent 30 years since, trying to understand how Americans had created such plans, and such a machinery, but with very ordinary motives. The word evil is almost misleading as it suggests satanic forces or demonic motives. These were well intentioned people with very ordinary, very banal motives. “If one returns to Israel, what if that question were

asked by Benjamin Netanyahu [at the time in his first term as prime minister]? Has he done so? With virtual certainty I feel he has not. Has any Israeli ever asked such a question? Has the calculation been made? I had thought that the general security service had not done so, but I was wrong. Perhaps the Israeli military do know the answer. If we gave them enough time to work it out, what would the answer be to the question, supposing the weapons are used on the targets for which they have been prepared?

Supposing the ground zero were hits on targets such as cities or other areas for which target folders have been prepared showing coordinates, how many people would die? It is a very simple calculation. "Assume Israel with more than 100, maybe 200, warheads – each on average the size of the Nagasaki bomb – each could produce 100,000 deaths. "I am a Jew. Should Jews have created machinery for the instant annihilation of 10 to 12,000,000 people? I do not want to be told that I don't have the right to ask that question because I am not an Israeli. "If being a Jew means anything, it gives me a right to ask that question. "I have already described what I, as an American, thought about the primary identity of my country, possessing capabilities to destroy 600,000,000 people. How would the Israeli military justify having the capabilities to kill 10-12,000,000, having bought it, trained for it, disciplined for it, prepared targets and so on. If the number is lower, let us hear it. "My question is, should not the Israeli president, parliament, people, know the answer to that question and then discuss whether the machinery needs expanding, as it is in the process of doing?"

**How would the Israeli military justify having the capabilities to kill 10-12,000,000, having bought it, trained for it, disciplined for it, prepared targets and so on. If the number is lower, let us hear it. "My question is, should not the Israeli president, parliament, people, know the answer to that question and then discuss whether the machinery needs expanding, as it is in the process of doing.**

How many could have been killed in 1986 when Vanunu made his decision? Why has Dimona been at work for the last 10 years? The discussion could not get started without Vanunu or his photos, and we would not have been believed about the scale of the program without these documents.

"This discussion is long overdue in Israel. This conference can contribute.

There is a chance for change." Ellsberg was too optimistic. More than 20 years have passed since that conference and the discussion has yet to take place here – certainly not publicly.

Source: <https://www.haaretz.com>, 28 May 2018.

**NUCLEAR STRATEGY**

**CHINA**

**China 'Aggressively Developing' Next Generation of Nuclear Weapons**

The China Academy of Engineering Physics reported that between September 2014 and last December, China carried out around 200 laboratory experiments to simulate the extreme physics of a nuclear blast. In comparison, the US only carried out 50 of such tests between 2012 and 2017.

**The China Academy of Engineering Physics reported that between September 2014 and last December, China carried out around 200 laboratory experiments to simulate the extreme physics of a nuclear blast. In comparison, the US only carried out 50 of such tests between 2012 and 2017.**

The report also revealed that China conducts an average of five nuclear experiments a month while the US conducts them less than once a month. Experts warned that as China, the United States and Russia separately seek more targeted nuclear weapons to deter against potential threats, the risk of a nuclear conflict inevitably increases.

Pentagon officials said the US wants its enemies to believe it might actually use such weapons,

which are smaller, tactically smarter and designed to destroy only specific targets limiting the damage. While they are not as destructive and cannot eradicate entire cities like their predecessors could, they are still far more powerful than conventional weapons.

Experts claim that precisely because of their safety, governments could be more likely to use them. A naval official based in Beijing said: "The use of small warheads will lead to the use of bigger ones." He also added that even though it is not likely for China to actually use such weapons, it was not necessary for Beijing to develop them. He explained: "If other countries use nuclear weapons on us, we have to retaliate. "This is probably why there is research to develop new weapons."

An international ban imposed in the 1990s prevents nuclear weapons from being tested — though North Korea has not followed the agreement. In place of the real tests, Chinese scientists instead use high-powered gas guns that fire projectiles in the country's main nuclear design facilities under mountains in Mianyang, southwestern Sichuan province. China is currently creating new tactical nuclear weapons meant for close-range battles. ...

*Source: Martina Bet, www.express.uk.in, 29 May 2018.*

**USA**

**As US Demands Nuclear Disarmament, it Moves to Expand its Own Arsenal**

For the White House, these have been dramatic days for nuclear disarmament: First President Trump exited the Iran deal, demanding that

Tehran sign a new agreement that forever cuts off its path to making a bomb, then the administration announced a first-ever meeting with the leader of North Korea about ridding his nation of nuclear weapons. But for the American arsenal, the initiatives are all going in the opposite direction, with a series of

**In place of the real tests, Chinese scientists instead use high-powered gas guns that fire projectiles in the country's main nuclear design facilities under mountains in Mianyang, southwestern Sichuan province. China is currently creating new tactical nuclear weapons meant for close-range battles.**

little-noticed announcements to spend billions of dollars building the factories needed to rejuvenate and expand America's nuclear capacity. The contrast has been striking. On 14 May, hours after Mr. Trump announced that his meeting with Kim Jong-un, the North Korean leader, would take place on June 12 in Singapore, the Pentagon and the Energy Department announced plans to begin building critical components for next-generation nuclear weapons at the Savannah River Site in South Carolina.

The idea is to repurpose a half-built, problem-ridden complex that was originally intended to turn old nuclear weapons into reactor fuel to light American cities. Now the facility will be used to revitalize America's aging nuclear weapons, and to create the capacity to make many hundreds more. The Pentagon, in its main nuclear strategy report released in February, cited North Korea's ability to "illicitly produce nuclear warheads" as a major

**On 14 May, hours after Mr. Trump announced that his meeting with Kim Jong-un, the North Korean leader, would take place on June 12 in Singapore, the Pentagon and the Energy Department announced plans to begin building critical components for next-generation nuclear weapons at the Savannah River Site in South Carolina.**

justification for the new effort. Also last week, a strategic forces subcommittee in the House approved Trump administration plans to build a new kind of low-yield nuclear weapon, launched from submarines, to match Russian nuclear advances. ...

It is hardly the first time the US has seen no inconsistency in expanding its own nuclear capabilities while trying to persuade lesser

powers to give up theirs. In fact, the imbalance is built into the Nuclear Non-proliferation Treaty, which went into effect in 1970. It prohibits all states that did not already have the bomb from building nuclear weapons. (Israel, Pakistan and India never joined, and North Korea dropped out.) But it also requires the acknowledged nuclear powers — the US, Russia, China, Britain and France — to work toward “the cessation of the nuclear arms race and to nuclear disarmament,” and ultimately to complete their own disarmament. For the two decades after the fall of the Berlin Wall, both the US and Russia could argue that they were making progress on that promise. The number of nuclear weapons deployed by the two countries fell, and fell again, under a series of arms control agreements, and as of earlier this year, both are now limited to 1,550 deployed weapons. Thousands more are in storage. Former US President Obama argued that the US could not urge other countries to give up nuclear programs while expanding its own. But many of his own aides later said they wished he had done far more to reduce America’s arsenal, arguing that it could safely drop below the number the Russians deployed. Now Mr. Trump is heading in the other direction.

The US has dramatically stepped up the effort to overhaul the existing arsenal and prepare for the day when it might once again be enlarged. Unless the New Start Treaty is renewed for five years, any limits on the American and Russian arsenals will expire in February 2021, just days after Mr. Trump would enter his second term. In the meantime, the American government is doing all it can to make clear it is preparing for an era of nuclear build-up. At the centre of the Savannah River announcement is the American production of something the nuclear industry calls “pits.” That is a term for a small atom bomb that, when detonated inside a warhead, acts as an

extraordinarily hot match to ignite a much larger mass of thermonuclear fuel. The resulting blast can easily be 1,000 times as powerful as the atomic bomb that destroyed Hiroshima.

One of the most closely held secrets of the nuclear age is how to make pits very small yet highly reliable. Most are about the size of a grapefruit. The small size makes thermonuclear warheads compact and lightweight enough to fit atop long-range missiles — it is one of the technologies that North Korea has been seeking, and may have already figured out. The announcement on Thursday sought to make lemonade out of two

**The US has dramatically stepped up the effort to overhaul the existing arsenal and prepare for the day when it might once again be enlarged. Unless the New Start Treaty is renewed for five years, any limits on the American and Russian arsenals will expire in February 2021, just days after Mr. Trump would enter his second term. In the meantime, the American government is doing all it can to make clear it is preparing for an era of nuclear build-up.**

large federal lemons. The pits have been made, until now, at the Los Alamos weapons laboratory in New Mexico, where America’s first nuclear weapons were built. But the lab has suffered a humiliating string of operating and safety failures, which in 2015 led the Obama administration to announce plans to end the current management contract there. Among the

breakdowns was the management’s failure to come up with a credible plan for producing up to 80 pits a year. At the same time, cost estimates for the Savannah River project to turn tons of excess weapons-grade plutonium into fuel for commercial power reactors had soared to \$17 billion.

Now that project is scrapped, and the two-pronged plan announced will also take the production pressure off Los Alamos — a move that seeks to maintain its profile as a scientific research centre rather than as a munitions factory. Los Alamos is to make 30 pits per year, and the South Carolina plant 50. That setup, the Energy and Defence Departments said, will improve “the resiliency, flexibility and redundancy of our nuclear security enterprise by not relying on a single production site.” ...The federal rationale for making up to 80 pits a year is hidden in layers of secrecy but turns

on stated fears that the plutonium fuel at the heart of American weapons will deteriorate with age, eventually rendering them useless. Whether that fear is justified is a matter of debate. In 2006, a federal nuclear panel found that the plutonium pits aged far better than expected, with most able to work reliably for a century or more. That judgment led critics to contend that the federal government was seeking a new generation of nuclear pits for reasons not of national security but of saber-rattling.

The Pentagon's Nuclear Posture Review, published in February, called for the new capability to produce plutonium pits. It also called on Congress to approve the new low-yield nuclear weapons. In May, the full House Armed Services Committee endorsed the Nuclear Posture Review, but with Democrats overwhelmingly voting against it. ...

Source: <https://www.nytimes.com>, 14 May 2018.

**BALLISTIC MISSILE DEFENCE**

**INDIA**

**India Gets New Nuclear Submarine Missiles, Joining only Russia, China, US and France**

India has equipped its latest nuclear-powered submarine with a new nuclear-capable missile that can hit targets up to 435 miles away, a capability enjoyed by only four other countries on Earth. Defense Minister Nirmala Sitharaman announced the military's feat during the annual Defence Research Development Organisation award ceremony on 14 May in New Delhi, where she recognized scientists A. Joseph and M. Ugender Reddy for their role in developing the K-15 Sagarika, also known as B-05. Sitharaman revealed that the advanced missile was officially put into service with the *INS Arihant* nuclear submarine. "It is an indigenous missile with several

innovative designs and a unique mechanism. Numerous critical technologies were proved in the successful trials, which paved the way for developing other long-range strategic missiles and has the potential to be launched from submarine, ship, and land," the award citation read....

Source: <http://www.newsweek.com>, 17 May 2018.

**ISRAEL**

**Drums of War? Israel has F-35's and Iran may Enhance its Ballistic Missile Program**

On 23 May, Israel revealed that its long-awaited F-35 stealth fighter jets are now operational. This

announcement represents a significant technological upgrade for the Israeli Defence Forces (IDF). Despite the design flaws and budgetary overruns that contractor Lockheed Martin encountered when building it, the F-35 has advanced data gathering mechanisms of its own, as well as radar evasion systems. But the F-35 announcement could also be read as a warning to Iran, or even as a new beat of the war drums.

**Nuclearization:** As tension between Iran and Israel ratchets up, commentators are asking where the military advantage lies, and what this means for regional nuclearization. Will aggression from Israel push Iran out of a weakened JCPOA nuclear agreement, and down the path of developing nuclear weapons? If so, how would Iran use such weapons, and how long would it take to develop them? And what else does Iran have in its arsenal to use against the IDF, one of the most effective militaries in the world, with nuclear power to boot? Answering these questions requires a close look at Iran's ballistic missiles....

Iran's manufacturing and use of ballistic missiles has been one of the major points of contention for opponents of the JCPOA. Whilst missile use by Tehran was not limited under the terms of the

**Will aggression from Israel push Iran out of a weakened JCPOA nuclear agreement, and down the path of developing nuclear weapons? If so, how would Iran use such weapons, and how long would it take to develop them? And what else does Iran have in its arsenal to use against the IDF, one of the most effective militaries in the world, with nuclear power to boot? Answering these questions requires a close look at Iran's ballistic missiles.**

JCPOA, many of the deals critics believe that it should have been. There is, however, a separate UN Security Council Resolution, number 2231, which prohibits Iran from undertaking “any activity related to ballistic missiles designed to be capable of delivering nuclear weapons, including launches using such ballistic missile technology”. Nevertheless, Iran has conducted missile tests since the resolution was struck. Though Tehran claims that it has not violated the resolution since the missiles were not intended for nuclear purposes, there are areas of doubt. For one thing, some diplomats fear that the language of the resolution is too vague to allow for punitive measures. And for another, some of Iran’s ballistic missiles are technically capable of carrying nuclear warheads.

This does not necessarily mean that they were designed for this purpose, nor that will they be used for such. However, the possibility is concerning. The IISS produced a detailed report weighing up the nuclear risks that Iran’s missiles represent. Al Bawaba spoke to its authors to find out what these missiles mean for a potential conflict.

**13 Varieties of Ballistic Missiles:** Out of 13 varieties of ballistic missiles in Iran’s arsenal, the majority appear to have been designed with conventional rather than nuclear weapons in mind. According to Michael Elleman, IISS’s Senior Fellow for Missile Defence, four varieties of Iranian missile could probably carry nuclear payloads. He told Al Bawaba:

*Only Iran’s Shahab-3 and Khorramshahr missiles appear to have been designed to be capable of nuclear delivery. However, if Iran were to fashion a nuclear weapon today, it could modify the nose cones for its Ghadr and Sajjil missiles for nuclear use. It is unclear if Iran has a bomb design that would fit on the Shahab-1, Shahab- 2 or Qiam missiles. Current bomb design does not, but this could change. I believe Shahab-3, Ghadr and Sajjil represent the biggest threat, if armed with a nuclear weapon. Khorramshahr, if developed over the next three to five years, would have to be included.*

Iran is, thankfully, still operating within the confines of the JCPOA, while Russia, China and the deal’s European signatories scramble to save the agreement. Europe is proving assertive in the face of American violation of the deal. It has drawn up a plan to prohibit EU-based companies from complying with American sanctions. EU leaders are also reportedly considering buying Iranian oil in Euros rather than dollars. China and Russia also have much to offer Iran, even within the confines of new sanctions. Still, as Iran feels increasingly vulnerable in the face of Israeli and Saudi aggression, it will be weighing up the benefits of a weakened JCPOA against the security that a nuclear deterrent might offer. ...

Source: <https://www.albawaba.com>, 24 May 2018.

## RUSSIA

### Putin Says Russia’s Defence Industry to Get New Yars Missile Complexes in 2018

Russian President Putin said on 15 May that 14 missile regiments would receive the new Yars intercontinental missile complexes to replace their old Topol complexes this year as part of a build-up of the state’s armed forces. Putin, whose relations with the West have deteriorated, said previously he does not want an arms race, while warning potential enemies that his country has developed a new generation of invincible weapons to protect itself.

At a meeting with defence ministry officials in the Black Sea city of Sochi on 15 May, Putin added that the national defence industry would also receive modernized missile-carrying bombers in 2018. “In the course of the year, the air part of a nuclear triad will receive modernized missile-carrying bombers TU-95MS and TU-160 armed with modern cruise long-range missiles Kh-101 and Kh-102,” he said. He also told officials that the defence sector should finish the development and prepare for manufacturing the S-500 surface-to-air anti-ballistic missile system capable of intercepting targets at the highest altitudes including near space.

Source: <http://www.euronews.com>, 15 May 2018.

**New S-500 Missile Flies Farther than Ever Before**

Russia has secretly carried out the world's longest surface-to-air missile test in a development that could strengthen its military capabilities in Europe and Syria. The S-500 Prometheus missile system struck a target 480 kilometres miles away; 80km farther than any previous known test, according to US intelligence sources cited by CNBC. It is unclear where and when the test took place. The Kremlin has not commented on the report but has said in the past that the ground-based system can intercept hypersonic missiles as well as stealth warplanes such as the F-22 and the F-35, the latest American weaponry. It can simultaneously aim at multiple targets, including cruise missiles. It is also able to target and destroy objects at near-space ranges of 96km above the Earth's surface.

Analysts say the S-500 would be ideal for providing Russia with ballistic missile defence along its European borders with NATO. If the missiles were deployed to the Kaliningrad enclave on the coast of the Baltic Sea they could reach Estonia, Latvia, Lithuania, as well as much of Poland — all NATO members. Deploying the S-500 to western Syria, where the Kremlin has already stationed the advanced S-400 system at its Khmeimim military base, would allow missiles to hit targets in northern Israel, Jordan and Iraq.

Russia did not activate its missile defence systems in Syria during the US-led airstrikes against the Assad regime in Damascus in April. However, the Kremlin announced after the attack that it would provide Syria with the S-300 missile system, which has a range of 320km. The deal could bring Russia into conflict with Israel, which has pledged to destroy the system if the missiles are used against its warplanes in the skies over Syria.

**Russia has secretly carried out the world's longest surface-to-air missile test in a development that could strengthen its military capabilities in Europe and Syria. The S-500 Prometheus missile system struck a target 480 kilometres miles away; 80km farther than any previous known test.**

**The Kremlin announced after the attack that it would provide Syria with the S-300 missile system, which has a range of 320km. The deal could bring Russia into conflict with Israel, which has pledged to destroy the system if the missiles are used against its warplanes in the skies over Syria.**

Russia has steadily boosted its development of advanced weaponry amid a stand-off with Western countries over Syria and Ukraine. In March President Putin hailed what he said were "invincible" new weapons, including nuclear-powered cruise missiles that he claimed had an unlimited range. His speech was accompanied by an animated video, broadcast live on national television, that showed Russian warheads raining down on Florida, where President Donald Trump often spends weekends at his Mar-a-Lago resort. Mr Putin said Russia had developed the weapons as a reaction to the US withdrawal in 2001 from an anti-ballistic missile treaty signed with the Soviet Union. "You didn't listen to our country then," he said. "Listen to us now."

Source: <https://www.theaustralian.com.au>, 26 May 2018.

**NUCLEAR ENERGY**

**CHINA**

**Bradwell Nuclear Plant Boosted by Chinese Dome Lift**

A dome lift at a Chinese nuclear plant has paved the way for the construction of a nuclear reactor at Bradwell B in Essex. The installation of the 260 ton dome at Unit 3 of the Fangchenggang plant in Guangxi Province is a major milestone

for the Bradwell project, which is looking to use the same HPR1000 nuclear technology.

CGN and EDF are working together through their joint venture company GNS (General Nuclear System Ltd) to gain regulatory approval for the UK HPR

1000. CGN UK CEO Zheng Dongshan said: "The announcement today shows the very positive

progress being made at Fangchenggang Unit 3, and illustrates once again our expertise, as the world's leading builder of nuclear power stations, in project management, engineering and construction of new reactors.

"This milestone for the HPR1000 technology is also great news for the Bradwell B project, showing that CGN will have a track record in safely and efficiently building and operating this type of reactor well before the project becomes operational in the UK." The UK HPR1000 GDA process is currently open for public comment. Another key permission is the Development Consent Order process, which will involve multiple stages of public consultation before submission to the UK Planning Inspectorate and a decision taken by the Secretary of State.

Source: Rob Horgan, <https://www.newcivilengineer.com>, 29 May 2018.

## JAPAN

### Japan Draft Plan Sets Ambitious Targets for Nuclear Energy

Japan's government proposed an energy plan on 16 May that sets ambitious targets for nuclear energy use in the coming decade despite challenges after the 2011 Fukushima disaster. The draft, presented to a government-commissioned panel, said that by fiscal 2030 nuclear energy should account for 20-22 percent of Japan's total power generation. The industry ministry's draft plan also sets a 22-24 percent target for renewable energy, with the remainder coming from fossil fuels, in line with goals set in 2015. The Cabinet is expected to approve the plan around July. The targets for nuclear energy appear difficult to achieve given that electric utilities are opting to scrap aging reactors rather than pay higher costs to meet post-Fukushima safety standards. Uncertainty over what to do with massive

radioactive waste in the crowded island nation is another big concern. The plan maintains Japan's fuel reprocessing ambitions despite international concerns about the stockpile of plutonium produced by the process.

The plan avoids the unpopular issue of building new nuclear plants to achieve the target. Panel chairman Masahiro Sakane, advisor to Komatsu Ltd., called it the "inconvenient truth" from which the government averted its eyes. Nuclear energy now accounts for less than 2 percent of Japan's energy mix since most reactors were idled after the 2011 Fukushima disaster. Only five reactors have since restarted. Japanese utilities have decided to scrap 15

**The draft, presented to a government-commissioned panel, said that by fiscal 2030 nuclear energy should account for 20-22 percent of Japan's total power generation. The industry ministry's draft plan also sets a 22-24 percent target for renewable energy, with the remainder coming from fossil fuels, in line with goals set in 2015. The Cabinet is expected to approve the plan around July.**

reactors, including six at Fukushima, since the accident, bringing the number of usable reactors down to 39. Experts say 16 more that remain idled are likely to be decommissioned and are not being considered for restarts. ...

... Japan has set a goal of cutting its carbon emissions by 26 percent from 2013 levels by 2030 and by 80 percent by 2050. Former PM Koizumi, who has become an anti-nuclear activist since the Fukushima accident, told the newspaper Tokyo Shimbun recently that nuclear energy could be costly because of safety requirements and the unrealistic fuel reprocessing program, and that Japan should shift from nuclear to renewables.

Source: <https://mainichi.jp>, 17 May 2018.

## UAE

### UAE's First Nuclear Reactor Start-Up Delayed

The start-up of the Arab world's first nuclear reactor - in the United Arab Emirates - has been delayed and should start operations between the end of 2019 and early 2020, the plant's operator said on 26 May. Nawah Energy Company, the operator of the Barakah Nuclear Energy Plant in the Al-Dhafra Region of Abu Dhabi, said it "has

completed a comprehensive operational readiness review" for an updated start-up schedule for the reactor.

The \$24.4 billion Barakah power plant is the world's largest nuclear project under construction and will be the first in the Arab world. "The results of Nawah's review forecast that the loading of nuclear fuel assemblies required to commence nuclear operations at Barakah Unit 1 will occur between the end of 2019 and early 2020," it said in a statement.

It was reported in March that the start-up had been pushed back to 2019 due to training delays.

"The resulting projection for the start-up of Unit 1 operations reflects the time required for the plant's nuclear operators to complete operational readiness activities and to obtain necessary regulatory approvals," Nawah said. The first of four reactors being built by KEPCO in the UAE is part of the Barakah power plant project that was originally scheduled to open last year. Barakah One is a joint venture between Emirates Nuclear Energy Corporation (ENEC) and KEPCO. The UAE will be the first new country to acquire nuclear power in more than two decades. ...

Source: <http://english.alarabiya.net>, 26 May 2018.

## **USA**

### **US and Partners form International Alliance to Push Nuclear Power**

The US is leading an initiative with several other governments to promote nuclear power and encourage investment in new nuclear technologies. The initiative, launched on 24 May by US Deputy Secretary of Energy Dan Brouillette with international partners, aims to "highlight the value of nuclear energy as a clean reliable energy source". The partners are Japan, Canada, Russia, South Africa, the UAE, Poland,

Argentina and Romania.

The US nuclear industry is battling competition particularly from natural gas, while many national governments want to reduce their dependency on the energy source after the nuclear accident at Japan's Fukushima plant in 2011. The group of nations aims to promote areas such as improved power system integration and the development of technologies like hybrid nuclear-renewable systems. "Nuclear-renewable systems could link emission-free nuclear power plants with variable renewables like solar or wind farms and could allow nuclear power to backstop intermittent generation," Brouillette said during the launch at the Clean Energy Ministerial (CEM) in Copenhagen.

**CEM is a global forum of 24 countries and the European Union which together account for 75 percent of global greenhouse gas emissions. Brouillette said the initiative would also focus on the development of SMR, which use existing or new nuclear technology scaled down to a fraction of the size of larger plants and would be able to produce around a tenth of the electricity created by large-scale projects.**

CEM is a global forum of 24 countries and the European Union which together account for 75 percent of global greenhouse gas emissions. Brouillette said the initiative would also focus on the development of SMR, which use existing or new nuclear technology scaled down to a fraction

of the size of larger plants and would be able to produce around a tenth of the electricity created by large-scale projects. Critics say SMR economies of scale will be limited because each reactor will need its own control and safety systems. They also point to the danger of spreading radioactive material more widely, increasing radiation and security risks.

The administration of President Trump also launched an alliance with Norway and Saudi Arabia to boost public and private partnerships on carbon capture, utilisation and storage (CCUS). Earlier...Japan released a draft of an updated basic energy policy, leaving its ideal mix of power sources for 2030 in line with targets set three years ago, despite criticism that it placed too much emphasis on unpopular nuclear power.

Source: <https://energy.economictimes.indiatimes.com>, 25 May 2018.

NUCLEAR COOPERATION

CHINA-UGANDA

**China and Uganda Agree to Nuclear Cooperation**

A MoU on cooperation in the peaceful uses of nuclear energy has been signed between China National Nuclear Corporation (CNNC) and the Ugandan Ministry of Energy and Mineral Development. The parties will give priority to cooperation in applying nuclear technology in medicine, agriculture and industry.

The MoU was signed in Beijing on 11 May by CNNC Chairman Wang Shoujun and Ugandan Minister of Energy Irene Muloni. At the meeting, Shoujun gave a presentation on the history of CNNC, the nuclear supply chain, the construction of the demonstration Hualong One units and the development of overseas markets. He highlighted the company's capabilities in the application of nuclear technology and expressed willingness to share this with Uganda. He said the use of nuclear technology would help Uganda raise its infrastructure capabilities and improve its people's living standards. Muloni introduced Uganda's energy and mineral resources, and emphasised that nuclear power development had been included in the country's long-term energy development plan. She said that CNNC's capabilities in the nuclear and non-nuclear sectors were in line with Uganda's industrial development needs and that the country was willing to conduct in-depth cooperation with the company.

The text of a draft MoU between the Ugandan ministry and CNNC was agreed upon during a May 2017 visit of a delegation from Uganda led by Prisca Boonabantu, undersecretary in the Ministry of Energy and Mineral Development. That visit followed a visit of Chinese officials to Kampala in March 2016. During 2017's visit, Boonabantu noted

that Uganda's Vision 2040 roadmap incorporated the development of nuclear energy as part of the country's future energy mix. "Plans have been made in Uganda to have clean and safe energy generation sources with nuclear being one of them," she said. The country, she added, welcomes partners to help construct, train and develop nuclear energy in line with IAEA standards.

In June 2017, Uganda's Ministry of Energy and Mineral Development signed an MoU on nuclear energy cooperation with Russian state nuclear corporation Rosatom. Uganda's Atomic Energy Bill came into effect in 2008, to regulate the use of ionising radiation and provide a framework to develop nuclear power generation. In October of that year, Uganda signed up to the IAEA's Country Programme Framework, which provides a frame of reference for planning medium-term technical

cooperation between an IAEA member state and the Agency, and identifies priority areas where the transfer of nuclear technology and technical cooperation resources will be directed to support national development goals.

Source: <http://www.world-nuclear-news.org>, 14 May 2018.

**Project Development Agreement has been executed between Jordan Atomic Energy Commission and Rosatom Overseas to enable the parties to conduct a joint feasibility study for a Russian-designed SMR construction project in Jordan. Both parties stand to benefit from exploring the collaboration on the SMR, and the viability and potential for deployment in the Hashemite Kingdom of Jordan due to the changing situation in the Jordanian energy market.**

RUSSIA-JORDAN

**Russia, Jordan to Focus their Nuclear Cooperation**

Building on their cooperation and studies performed for a large NPP, Russia and Jordan have decided to intensify and step up their cooperation in the field of SMRs. On May 24, 2018, a Project Development Agreement has been executed between Jordan Atomic Energy Commission and Rosatom Overseas to enable the parties to conduct a joint feasibility study for a Russian-designed SMR construction project in Jordan. Both

parties stand to benefit from exploring the collaboration on the SMR, and the viability and potential for deployment in the Hashemite Kingdom of Jordan due to the changing situation in the Jordanian energy market.

“We have been cooperating with Rosatom for many years, and we are going to build on this cooperation in various spheres. Today, a potential project to construct SMR-type NPP seems more relevant and more needed, so we would like to focus on it”, said Dr. Khaled Toukan, Chairman of the Jordan Atomic Energy Commission.

“We are certain that the projects we implement have to meet current strategic needs and interests of our customers. This is exactly why we, together with our Jordanian partners, have decided to focus our cooperation on enhancing SMR technology projects based on Rosatom’s innovative solutions. The SMR technologies will certainly become one of our top priorities on the way to develop the world energy market”, pointed out Evgeny Pakermanov, President of JSC Rusatom Overseas.

Russia enjoys a first class globally respected wide range of expertise in the field of SMR energy. As early as 2019, Rosatom State Corporation is going to launch Akademik Lomonosov, its floating NPP, which will become the world’s first reference project for nuclear power plants of this type. On top of that, Rosatom is actively developing its onshore Russian-design SMR NPP. Apart from its modular composition, one of the main advantages of the Russian-design SMR NPP is its ability to be used as a desalination and heating plant. Jordan is looking forward to benefit from all the available technologies in order to strengthen its local dependency on energy.

Russia and Jordan are cooperating closely in the human resource development area, to implement the nuclear program of the Hashemite Kingdom of Jordan. Currently, 100 Jordanian students are conducting their Bachelor, Master and other postgraduate studies and programs in major Russian universities.

*Source: <http://petra.gov.jo>, 26 May 2018.*

## **NUCLEAR DISARMAMENT**

### **NORTH KOREA**

#### **North Korea Nuclear Disarmament could Take 15 Years, Expert Warns**

As the Trump administration races to start talks with North Korea on what it calls “rapid denuclearization,” a top federal government adviser who has repeatedly visited the North’s sprawling atomic complex is warning that the disarmament process could take far longer, up to 15 years. The adviser, Siegfried S. Hecker, a former director of the Los Alamos weapons laboratory in New Mexico, and now a Stanford professor, argues that the best the United States can hope for is a phased denuclearization that goes after the most dangerous parts of the North’s program first.

The disarmament steps and timetable are laid out in a new report, circulated recently in Washington, that Dr. Hecker compiled with two colleagues at Stanford’s Center for International Security and Cooperation. Dr. Hecker has toured that nation’s secretive labyrinth of nuclear plants four times and remains the only American scientist to see its facility for enriching uranium, a bomb fuel. American intelligence agencies had missed the plant’s construction.

Dr. Hecker’s time frame stands in stark contrast with what the United States initially demanded, on what could be a key sticking point in any summit meeting between President Trump and Kim Jong-un, the North Korean leader.

Two American delegations, one in Singapore and one in North Korea, are attempting to work out a meeting between the two leaders. Mr. Trump canceled the meeting in a letter to Mr. Kim but has been working to reconstitute it ever since, posting Twitter messages that say he is confident the North Korean economy will prosper if an accord is reached.

The delegation in Singapore is discussing the logistics of a meeting, to be held June 12 or afterward. The other, led by Sung Kim, an American diplomat with long North Korea experience, is meeting senior officials of the North Korean

Foreign Ministry at the Demilitarized Zone to work on the wording of what kind of communiqué might be issued by the two leaders. But the White House and State Department have said nothing about the details of those discussions.

In an interview, Dr. Hecker said he was making the Stanford study public to advance discussion of a complicated topic that will be at the heart of Mr. Trump's encounter with Mr. Kim in Singapore, if that meeting happens. So far, the denuclearization

agenda has been a mix of bold claims by the administration about what it will demand, and vague generalities from the North.

Dr. Hecker cautioned that his team's road map left room for many knotty points of negotiation — such as where to draw the line between civilian and military nuclear activities. At first, the Trump administration said the North must give up all enrichment of uranium, which can fuel not only bombs but reactors that illuminate cities. Last week, Secretary of State Mike Pompeo, testifying before the Senate Foreign Relations Committee, said for the first time that he needed some “negotiating space” on that question.

But Mr. Trump exited the Iran nuclear deal because it allowed the country to produce atomic fuel after 2030, which he said was an unacceptable risk. It is unclear how he could ban Iran from peaceful production, yet allow North Korea to do the same. Dr. Hecker said a similar open question was whether to let the North's rocket engineers, now making long-range missiles, redirect their skills into a peaceful space program. “They're not going to eliminate everything, and there're some things that aren't a problem,” Dr. Hecker said. “Some of the risks are manageable.”

In its report, the Stanford team sees three overlapping phases of denuclearization activity that, in total, would take 10 years. The initial

phase, taking up to a year, is the halt of military, industrial and personnel operations. The second, taking up to five years, is the winding down of sites, facilities and weapons. The final and hardest phase, taking up to 10 years, is the elimination or limiting of factories and programs. Dr. Hecker noted that the decontamination and decommissioning of a single plant that handles radioactive materials could take a decade or more.

In an interview, Dr. Hecker said his personal denuclearization estimate ran to 15 years given the

tangle of political and technical uncertainties that the United States and North Korea would face if they went ahead and sought a historic accord. The road map, which was posted on a Stanford website and was circulated to some administration officials and members of Congress, underscores the complexity of the task at hand: While politicians and cable news commentators use the shorthand of the North surrendering its nuclear arms, the road map makes clear that denuclearization would be a vast undertaking that involved the shuttering of large industrial plants and decades of detailed inspections.

The Trump administration has made public no details of what particular steps it sees for the North's denuclearization, or what it intends to demand if Mr. Trump meets with Mr. Kim. Its bottom line is that denuclearization must be complete, verifiable and irreversible. Mr. Trump's hawkish national security adviser, John R. Bolton, argued before joining the administration in April that the president should use a summit meeting

exclusively to tell North Korea to dismantle and deliver up all its nuclear arms and equipment, saying only then should the United States discuss easing sanctions and participating in the North's economic development.

In recent television and radio interviews, Mr. Bolton has advocated quick denuclearization in which the North would send its weapons and

**Three overlapping phases of denuclearization activity that, in total, would take 10 years. The initial phase, taking up to a year, is the halt of military, industrial and personnel operations. The second, taking up to five years, is the winding down of sites, facilities and weapons. The final and hardest phase, taking up to 10 years, is the elimination or limiting of factories and programs.**

**Three overlapping phases of denuclearization activity that, in total, would take 10 years. The initial phase, taking up to a year, is the halt of military, industrial and personnel operations. The second, taking up to five years, is the winding down of sites, facilities and weapons. The final and hardest phase, taking up to 10 years, is the elimination or limiting of factories and programs.**

equipment to the Oak Ridge National Laboratory in Tennessee, where nuclear inspectors in 2004 shipped some of Libya's gear for enriching uranium. Mr. Bolton has repeatedly cited Libya as a role model for the North's atomic disarmament. In the interview, Dr. Hecker argued that the only safe way to disassemble the North's nuclear warheads was to have the job done by the same North Korean engineers who built them. Mr. Trump, in contrast to Mr. Bolton's public stance, twice last week opened the door to phased denuclearization, saying the North might find it impossible to dismantle its entire nuclear program in one step. Dr. Hecker comes to the issue with decades of experience in learning about foreign nuclear programs and managing their phased reductions.

... The team divides up the North's nuclear program into eight general categories and 22 subgroups. The range is wide. It includes not just plants and facilities but related issues such as ending the North's missile and nuclear exports and redirecting its technical experts from military to civilian work. Plutonium fuel for atom bombs is especially frequently mentioned. The radioactive metal is considered the founding step for aggressive programs set on making a variety of nuclear arms.

Producing it is easier than purifying uranium, and it takes far less plutonium to make a blast of equal size. Atop a missile, all else being equal, the reduced weight means warheads fueled by plutonium can fly longer distances, making them more threatening. Plutonium is also ideal for igniting the thermonuclear fuel of hydrogen bombs.

The Stanford team recommends six ways to curb the North's plutonium complex, targeting Yongbyon, the secretive site that Dr. Hecker has repeatedly visited. For instance, the team calls for the dismantlement of the North's five-megawatt reactor for making plutonium. It began operating in 1986, and Western experts say it produced the fuel for the North's first atom bombs.

**The US should insist on clarity regarding North Korea's denuclearization commitments and what Pyongyang must do to fulfill them. Past agreements have included vague statements about the "denuclearization of the Korean Peninsula." The agreements have incorporated ambiguous, deceptive concepts of denuclearization, expressed in language such as "freeze, verifiable abandonment, shut-down, sealing, and disabling."**

The team is less categorical in recommendations for a large new reactor, known as the experimental light-water reactor, now being started up at Yongbyon. Since the plant can make electrical power for civilians, the team suggests the reactor needs to be closely inspected before its fate is negotiated.

The team calls for the North to join two global accords meant to halt the making of nuclear arms and the means of delivering them. The pacts are the NPT, which the North once observed, and the MTCR. Its member states coordinate export licensing to curb the spread of long-range missiles that can deliver weapons of mass destruction.

"We're going to have some people argue with us," Dr. Hecker said of how technical experts were likely to react to the team's recommendations. "That's O.K."

*Source: William J. Broad and David E. Sanger, <https://www.nytimes.com>, 28 May 2018.*

### **Concrete Steps toward North Korean Nuclear Dismantlement**

The summit between Donald Trump and Kim Jong-un, scheduled for June 12 in Singapore, is off. Even before Trump announced the meeting's cancellation, expectations for the summit may have outpaced realistic outcomes. Now the path forward is extremely unclear. Still, considering the unpredictable leadership styles of both Kim and Trump, it isn't inconceivable that plans for a summit could be revived. If any such summit, as well as its follow-on negotiations, are to succeed, four conditions will have to be met.

First, the US should insist on clarity regarding North Korea's denuclearization commitments and what Pyongyang must do to fulfill them. Past agreements have included vague statements about the "denuclearization of the Korean Peninsula." The agreements have incorporated ambiguous, deceptive concepts of denuclearization, expressed in language such as "freeze, verifiable abandonment, shut-down, sealing, and disabling." The US therefore should insist that North Korea commit in the joint

statement of any summit to the verifiable dismantlement of its nuclear weapons, nuclear materials, and nuclear facilities. Indeed, Washington should insist on verifiable dismantlement as the overarching goal of negotiations. If Pyongyang agrees to this commitment, the two sides would be required to hold continuous, high-level negotiations toward a comprehensive, verifiable, and irreversible dismantlement of North Korea's nuclear capabilities, including research and development facilities.

Second, the US should take primary responsibility for establishing a verification mechanism for the

complete dismantlement of the North's nuclear weapons program. Why? North Korea is neither a member state of the NPT nor a member of the IAEA. In 1993 Pyongyang announced its intention to leave the NPT and the IAEA, and actually did so in 2003—actions unprecedented in the history of the treaty. Under previous nuclear agreements, nuclear inspections were delegated to the IAEA by the US and other countries. North Korea, however, denied the agency access to certain sites, asserting that they were military bases and that the IAEA therefore lacked the authority to enter and inspect them. Pyongyang denied the agency access to other facilities by failing to declare them and open them to inspections. This prevented the agency from inspecting secret facilities that were critical to the North Korean nuclear program.

Furthermore, North Korea sometimes expelled agency inspectors from facilities they already were monitoring. Now that North Korea has become a nuclear-armed state, any prospective nuclear agreement would require the participation and supervision of experienced inspectors from nuclear weapon states such as the US. One positive point is that, because North Korea dislikes the IAEA due to bad experiences in the past, Pyongyang probably would prefer American inspectors. If the North Korean leader decides to exchange nuclear dismantlement for

US diplomatic normalization, Pyongyang very likely would accept direct US involvement in inspection activities to build trust and confidence. If the US and North Korea agreed on methods for verifying the nuclear dismantlement process, Washington could call on other nations to help organize an international consortium for verification.

**The US would seek to ensure that the international community did not remove sanctions until the baseline inspections were completed. Then, during the dismantlement phase, the international community would gradually start providing economic and diplomatic incentives to North Korea, in proportion to the magnitude and scale of nuclear dismantlement.**

Third, there should be no loopholes regarding the inspection of suspicious sites or facilities, including facilities for nuclear research and development, manufacturing, fissile material production and storage, testing, nuclear weapons themselves, and military bases under North Korea's Strategic Forces.

Furthermore, research and development institutes would have to be established to absorb nuclear scientists and engineers as they transition into jobs that utilize their skills for peaceful purposes.

Fourth, the US should consult with South Korea and Japan to work out the types of incentives and rewards that North Korea would receive in exchange for verifiable nuclear dismantlement. The scale and sequencing of incentives and rewards should be proportional to the progress of dismantlement. Progress should be ascertained through a verification process that begins with baseline inspections—that is, inspectors led by the US would draft a complete list of inspection sites to minimize the possibility that North Korea could conceal facilities in its voluntary reporting. Those sites would then be inspected. At later stages, inspectors would conduct dismantlement inspections and close-out inspections, and also establish permanent stationary monitoring and inspections.

In such a scenario, the US would seek to ensure that the international community did not remove sanctions until the baseline inspections were completed. Then, during the dismantlement phase, the international community would gradually start providing economic and diplomatic incentives to North Korea, in proportion to the magnitude and scale of nuclear dismantlement. If Pyongyang

abandoned all its nuclear weapons and nuclear weapons facilities, North Korea would be welcomed into the international community and would be provided large-scale assistance with the development of its economy and society. However, even in this scenario, the international community should maintain a robust sanctions regime until the US and North Korea began to implement a comprehensive nuclear dismantlement system. South Korea should link the improvement of inter-Korean relations to the progress of denuclearization. Finally, the US and South Korea should maintain a strong posture of conventional and extended nuclear deterrence until North Korea becomes a verified non-nuclear weapon state.

Source: <https://thebulletin.org>, 25 May 2018.

**URANIUM PRODUCTION**

**USA**

**US will Decide whether Uranium from Countries like Russia Pose National Security Risk**

As questions and investigations about Russian influence in the US election process continue, what many Americans may not realize is that adversarial countries, like Russia, stand to have an outsized influence over our power grid. Uranium, which is on an Interior Department target list of critical minerals, fuels nuclear power plants, which generate 20 percent of electricity in the US. It also helps power U.S. Navy assets. One pound of uranium is equivalent to 20,000 pounds of coal.

Currently, much of the US uranium demand is filled by Russia, Kazakhstan and Uzbekistan. Now, two Colorado-based uranium mining companies, Ur-Energy and Energy Fuels, are awaiting word on a petition for relief they filed with the US Commerce Department to investigate whether uranium imports from places such as Russia pose a

**Two Colorado-based uranium mining companies, Ur-Energy and Energy Fuels, are awaiting word on a petition for relief they filed with the US Commerce Department to investigate whether uranium imports from places such as Russia pose a national security risk. According to a report...from the U.S. Energy Information Administration (EIA), U.S. production of uranium concentrate in the first quarter 2018 was down 64 percent since from the fourth quarter 2017 and it was also down 50 percent compared to the same time a year ago (first quarter 2017).**

national security risk. According to a report...from the U.S. Energy Information Administration (EIA), U.S. production of uranium concentrate in the first quarter 2018 was down 64 percent since from the fourth quarter 2017 and it was also down 50 percent compared to the same time a year ago (first quarter 2017). Ur-Energy CEO Jeffrey Klenda said the shrinking U.S. piece of the uranium supply chain costs jobs.

“Over the last three years, both of us have had to reduce our workforces by an excess of 50 percent,” he said. “The harsh reality is we have now been reduced in this country, to a level of production that have not been seen since 1950.” The companies are not seeking tariffs. They want a quota on uranium coming from outside the U.S., so domestic producers can provide 25

percent. Also, they are asking for U.S. agencies that rely on uranium to “buy American” (U.S.-produced material). If the government agrees, it would be “an excellent way for us to salvage the U.S. market, allow us to be thrown a lifeline and do it in a manner that was the least harmful to our utility customers,” Klenda said. “Right now, the US, in my opinion, is much too dependent on people who are not our friends for uranium,” said Sen.

His state is the country’s leading uranium producer, according to the Wyoming Mining Association. Referring to Russia, Uzbekistan, Kazakhstan, Barrasso said, “We’re importing uranium from those countries and we’re not producing it in the US. We should be producing it here, mining it here and enriching it here. To me, that’s an importance in terms of energy security as well as national security.” Barrasso’s state has plentiful uranium reserves.

Late IN 2017, President Trump issued a

presidential order to break U.S. dependence on foreign minerals. ... A spokesperson for the U.S. Commerce Department's Bureau of Industry and Security said the bureau is reviewing the petition from Ur-Energy and Energy Fuels to "determine if it contains sufficient information to initiate an investigation. There is no deadline for completion of this initial review, but Commerce will look to conclude its review quickly." If hostility erupts and there is a disruption of uranium supply from foreigners, "our U.S. utilities would virtually be in crisis overnight," Klenda said. "When you take a look at these countries as trading partners, often times, these have become adversarial relationships.... How much are we going to trust those relationships? Can they hold us hostage anytime they want?"

Source: <http://www.foxnews.com>, 26 May 2018.

## **NUCLEAR NON-PROLIFERATION**

### **INDIA-NETHERLANDS**

#### **Netherlands Vows Support to Building Consensus for India's NSG Bid**

The Netherlands on 24 May reaffirmed its support to building consensus among members of the NSG over India's bid to be part of the elite grouping. A joint statement released after the talks between Indian PM Modi and his Dutch counterpart Mark Rutte said the two sides reaffirmed their commitment to strengthening disarmament and global non-proliferation efforts. The Netherlands congratulated India's accession to the MTCR, Wassenaar Arrangement and the Australia Group, three export control regimes. "In order to further strengthen global non-proliferation, the Netherlands reaffirmed its strong support to building consensus among regimes' members on the issue of India's membership to the NSG," the statement said. ...

Source: <https://www.ndtv.com>, 25 May 2018.

### **IRAN**

#### **Iran Calls for Clarity over Nuclear Deal after Talks with China**

Iran's FM Javad Zarif sought further talks after

failing to win any concrete assurance to help tackle the U.S. threat of economic sanctions over its nuclear program. The meeting with Wang Yi in Beijing, at China's invitation, is Zarif's first stop on a diplomatic tour after President Trump withdrew from the 2015 deal to limit Iran's nuclear program and threatened to re-impose the "highest level" of financial sanctions on the Islamic Republic. Zarif was scheduled to meet the British, French and German foreign ministers on May 15 in Brussels.

"We hope that with this visit to China and other countries we will be able to construct a clear future design for the comprehensive agreement," Zarif said. "My colleagues have had in-depth talks with their counterparts in China's foreign ministry over our cooperation, especially over the details of our cooperation." China offered to hold strategic talks with Iran but did not disclose whether Beijing might scale back imports in light of renewed U.S. sanctions. "I hope and believe that these visits to multiple countries will improve countries', including China's, understanding of Iran's position," Wang said. "It will allow you to make your own positive contribution to help protect Iran's legitimate national interests and peace and stability in the region."

China offers Iran a valuable alternative to trade with the U.S. and Europe. Commerce between Iran and China has more than doubled since 2006 to \$28 billion with oil exports from Iran valued at \$11 billion a year. Chinese companies have been among the most active in investing in Iranian infrastructure projects and energy assets after sanctions were lifted in 2016. State-owned train builder CRRC Corp. this year beat bids from two European rivals to win a contract worth more than \$900 billion to supply wagons for the subways of several Iranian cities. In the past year, Chinese companies have signed some \$2.2 billion in deals to build or fund railway lines to the eastern city of Mashhad and the Gulf port of Bushehr. China's largest energy company, China National Petroleum Corp., stands to take control of the contract to develop the South Pars gas field if its French partner Total SA can't win an exemption from US sanctions.

China has found ways to bypass sanctions on Iran in the past. It has settled some of its oil debt through barter and Iran has used yuan paid into Chinese bank accounts to buy Chinese goods. Beijing-based oil importer Zhuhai Zhenrong Co. kept buying Iranian oil after the previous sanctions were put in place in 2012 and will likely keep doing so when they are reimposed, analysts say.

**China has found ways to bypass sanctions on Iran in the past. It has settled some of its oil debt through barter and Iran has used yuan paid into Chinese bank accounts to buy Chinese goods. Beijing-based oil importer Zhuhai Zhenrong Co. kept buying Iranian oil after the previous sanctions were put in place in 2012 and will likely keep doing so when they are reimposed.**

Source: <https://www.bloombergquint.com>, 14 May 2018.

### Iran FM in Moscow as Russia Moves to Save Nuclear Deal

Iran's FM said on a visit to Moscow on 14 May that he was seeking "assurances" from the backers of the country's nuclear deal after the US pulled out. Russia is trying to keep the landmark 2015 accord alive in the wake of US President Trump's decision, pushing Moscow into rare cooperation with Europe. "The final aim of these negotiations is to seek assurances that the interests of the Iranian nation will be defended," Mohammad Javad Zarif said at the start of a meeting with his Russian counterpart Sergei Lavrov.

**Russian efforts to save the accord will boost its role as a power player in the Middle East, after its intervention on the side of Bashar Assad's regime in Syria. This, along with its diplomatic moves to orchestrate an end to the Syrian conflict, has put Moscow at loggerheads with the US and Europe, which have intervened against the regime.**

After the talks, Zarif praised the "excellent cooperation" between Moscow and Tehran and said Lavrov had promised him to "defend and keep the agreement". Zarif later said he was seeking "solutions in order for other countries, in particular those remaining in the agreement, to have relations with Iran without hindrance," in comments reported by the Iranian ISNA news agency. Lavrov, for his part, said Russia and Europe had a duty to "jointly defend their legal interests" in terms of the deal. Zarif's diplomatic tour took him to Beijing at the weekend and will see him visit Brussels later in the week, as the

international backers of the agreement scramble to save it. On 14 May he also sent a letter to the UN in which he accused the U.S. of showing a "complete disregard for international law" in pulling out of the deal.

Russian President Putin has already spoken with German Chancellor Merkel and Turkey's President Erdogan about efforts to save the accord, after voicing his "deep concern" over Trump's decision. And Putin met Yukiya Amano, the head of the IAEA, telling him that Russia was "ready to continue to uphold the Iran nuclear deal despite the withdrawal of the US". Trump's move to ditch the nuclear deal has infuriated Washington's allies in Europe as well as China and Russia. "[European] cooperation with Russia, which until recently seemed impossible because of the Skripal [spy poisoning] case, with the expulsion of diplomats and the reduction of contact, is now receiving a fresh boost," said Andrei Baklitsky of the Moscow-based PIR Center nuclear safety NGO.

"The Europeans, after the withdrawal of the US from the deal, have found themselves forced to save the JCPOA themselves,"... referring to the official name of the nuclear deal. Moscow would have to play a key role in ensuring Tehran does not resume its

nuclear program, he added. On 13 May, US Secretary of State Pompeo said Washington still wants to work with Europe to counter Iran's "malign behaviour." But while Pompeo talked up the prospect of renewed coordination with America's allies, another top aide reminded Europe its companies could face sanctions if they continue to do business with the Middle Eastern power. Russian efforts to save the accord will boost its role as a power player in the Middle East, after its intervention on the side of Bashar Assad's regime in Syria. This, along with its diplomatic

moves to orchestrate an end to the Syrian conflict, has put Moscow at loggerheads with the US and Europe, which have intervened against the regime. Merkel is set to visit Russia and meet Putin for a working visit in the Black Sea resort of Sochi, while French President Emmanuel Macron will be in Saint Petersburg for an economic forum.

**Iran has said it is preparing to resume "industrial-scale" uranium enrichment "without any restrictions" unless Europe can provide solid guarantees that it can maintain trade ties despite renewed US sanctions.**

Iran has said it is preparing to resume "industrial-scale" uranium enrichment "without any restrictions" unless Europe can provide solid guarantees that it can maintain trade ties despite renewed US sanctions. ... Analysts have suggested Russia could benefit economically from the US pull-out, as it is less exposed to the consequences of renewed sanctions than Europe.

*Source: <http://www.dailystar.com.lb>, 14 May 2018.*

### **Europe and Iran Reiterate Commitment to JCPOA**

The European Commission and the Atomic Energy Organisation of Iran (AEOI) have confirmed their continuing commitment towards implementation of JCPOA, following a visit by European commissioner for climate action and energy Miguel Arias Cañete to Tehran.

"We met today to confirm the continuing commitment of the European Commission and the AEOI towards the implementation of the JCPOA, and in particular its Annex III which addresses civil nuclear cooperation," Cañete and Ali Akhbar Salehi, president of the AEOI, said in a joint statement on 19 May. "We believe that the continuing implementation of the JCPOA, which was unanimously endorsed by UN Security Council Resolution 2231, is crucial for the development and progress of the region as well as the global peace and security."

**We believe that the continuing implementation of the JCPOA, which was unanimously endorsed by UN Security Council Resolution 2231, is crucial for the development and progress of the region as well as the global peace and security.**

"The JCPOA represents the fruit of more than a decade of successful multilateral diplomacy which signifies the imperative of peaceful settlement of dispute and is a key element of the global nuclear non-proliferation architecture,"

they said. The statement notes that the IAEA - which is responsible for verifying and monitoring Iran's implementation of its nuclear commitments under the plan - has so far confirmed in ten successive reports that Iran has implemented those commitments. "[F]or its part, the EU will remain committed to the continued full and effective implementation of the JCPOA, as long as Iran continues to implement its nuclear related commitments," the statement adds.

The European Commission has opened up its nuclear research programme for Iranian participation, and exchanges and visits of nuclear scientists have already taken place. Ongoing projects between the two bodies address nuclear safety cooperation including: a project for stress testing of Iran's first nuclear power plant, Bushehr 1; a project to prepare for the establishment of a nuclear safety centre in Iran, and projects to enhance the capabilities of Iran's Nuclear Regulatory Authority.

The European Commission and the AEOI have also deepened working level contacts aimed at bringing nuclear safety specialists of the both sides together: Iranian specialists have participated in the bi-

annual conference of EU nuclear safety regulator's group ENSREG and have also participated in the peer review of the stress test of a reactor under construction. Iranian specialists also were invited to the launch of the EU's Samira project on non-power applications of nuclear energy and nuclear technology, and Iran and the EU are currently preparing a technical seminar on the issue of third-party nuclear liability and insurance, they said.

"The European Commission is also strongly supporting Iran's endeavours in governing the safe and responsible use of nuclear energy, including accession to the relevant international conventions," the statement notes. "We welcome the strengthening of ties at all levels and look forward to their further development over the coming months and years." A third high level seminar on nuclear cooperation will take place in Brussels at the end of November 2018. US President Trump on 8 May announced the termination of the USA's participation in the JCPOA, directing the US administration to begin the process of re-imposing sanctions on Iran.

Source: <http://world-nuclear-news.org>, 21 May 2018.

**Sadly, based on the tremendous anger and open hostility displayed in your most recent statement, I feel it is inappropriate, at this time, to have this long-planned meeting." Trump declared that the meeting would not take place "for the good of both parties, but to the detriment of the world.**

The Trump administration had been growing increasingly concerned about a lack of response from Pyongyang in recent days to efforts to set up planning meetings in the run-up to the summit scheduled for 12 June in Singapore. "Some of the prep work on the summit was halted because we simply could not get them to pick up the phone," a senior White House official said. In a formal letter to Kim released by the White House, Trump said he had been "very much looking forward" to meeting the North Korean leader. But he wrote:

"Sadly, based on the tremendous anger and open hostility displayed in your most recent statement, I feel it is inappropriate, at this time, to have this long-planned meeting." Trump declared that the meeting would not take place "for the good of

both parties, but to the detriment of the world". In remarks to the press after the letter was released, Trump said it was still possible the summit could go ahead, albeit at a later date, but warned Pyongyang that the US and its allies would respond if it carried out "foolish or reckless acts".

Asked if cancellation of the summit increased the risk of war, he replied: "We'll see what happens."

Meanwhile, the President said his campaign of "maximum pressure" would continue, involving the "strongest sanctions ever imposed". However, in the wake of Trump's withdrawal

from this summit, soon after abrogating a nuclear deal with Iran that had global support, there are now serious doubts over his ability to galvanise international support for increased sanctions, or even enforce the existing sanctions regime. ...The cancellation came two days after a visit to the White House by the South Korean president, Moon Jae-in, who had sounded hopeful about a historic summit that he portrayed as vital to peace on the Korean peninsula. Moon held an emergency meeting with top officials just before midnight

**NUCLEAR PROLIFERATION**

**NORTH KOREA**

**Donald Trump Cancels North Korea Nuclear Summit**

Donald Trump cancelled his planned summit with the North Korean leader, Kim Jong-un, blaming his decision on a threatening statement from the Pyongyang regime, and warning that the US military is "ready if necessary". The abrupt decision, which came as a surprise to US allies in the region, came after an exchange of menacing statements from US and North Korean officials. North Korea responded to the cancellation by saying Kim Jong-un had made the utmost effort to hold the summit with President Trump and the country was willing to resolve issues with the United States. "We tell the US once more that we are open to resolving problems at any time in any way," North Korea's vice Foreign Minister Gwan said in a statement.

**In the wake of Trump's withdrawal from this summit, soon after abrogating a nuclear deal with Iran that had global support, there are now serious doubts over his ability to galvanise international support for increased sanctions, or even enforce the existing sanctions regime.**

local time on Thursday. His office appeared surprised by the announcement, with spokesman Kim Eui-kyeom saying: "We are trying to figure out what President Trump's intention is and the exact meaning of it." Pyongyang also appeared to be taken entirely by surprise.

"Ripley was part of an international group of journalists invited to North

Korea to cover the destruction of a nuclear test site. The detonation of a system of mountain tunnels at Punggye-ri was presented by the regime as a gesture of good faith, although the regime has declared that it has made sufficient advances in its nuclear weapons technology to no longer need to conduct tests. Speaking in Geneva, the UN secretary general, António Guterres, said he was "deeply concerned" about the cancellation of the summit, and appealed for a continued dialogue to "find a path to the peaceful and verifiable denuclearization of the Korean peninsula". A White House official said Trump had made the decision to cancel after speaking to Vice-President Mike Pence, the secretary of state, Mike Pompeo and national security adviser, John Bolton. The summit had been in grave doubt for days, the official said, but the last straw was a strongly worded statement by North Korea's vice-foreign minister Choe Son-hui, which in turn was a response to hardline comments by Pence.

In her statement, Choe warned that Pyongyang could make the US "taste an appalling tragedy". If the talks are cancelled, Choe suggested the two countries could engage in a "nuclear-to-nuclear showdown. ...Whether the US will meet us at a meeting room or encounter us at nuclear-to-

**Pyongyang could make the US "taste an appalling tragedy". If the talks are cancelled, the two countries could engage in a "nuclear-to-nuclear showdown. Whether the US will meet us at a meeting room or encounter us at nuclear-to-nuclear showdown is entirely dependent upon the decision ... of the US. We will neither beg the US for dialogue nor take the trouble to persuade them if they do not want to sit together with us.**

nuclear showdown is entirely dependent upon the decision... of the US. We will neither beg the US for dialogue nor take the trouble to persuade them if they do not want to sit together with us."

In his letter, Trump thanked Kim for releasing three US citizens in April, 2018. He said: "That was a beautiful gesture and was very much appreciated." He left the

door open to a future meeting if and when the war of words calmed down. "I felt a wonderful dialogue was building up between you and me, and ultimately, it is only that dialogue that matters. Someday, I look very much forward to meeting you," he wrote in a letter that which contained all the oddities of syntax and grammar of Trump's speaking style.

...North Korean officials failed to appear at a logistics meeting with their US counterparts, earlier this month. "They stood us up," a senior

**The immediate trigger for the row that derailed the summit was the Trump administration's repeated references to the "Libyan model", which was presented by some officials as referring to Muammar Gaddafi's 2003 agreement to abandon his nuclear weapons programme and surrender related equipment and materials to the US.**

White House official said. A follow-up meeting in Singapore had been planned for this weekend, but Pompeo said: "We had received no response to our inquiries from them." The immediate trigger for the row that derailed the summit was the Trump administration's repeated references to the "Libyan model", which was

presented by some officials as referring to Muammar Gaddafi's 2003 agreement to abandon his nuclear weapons programme and surrender related equipment and materials to the US. Trump and Pence, however, used the phrase to refer to the 2011 toppling of Gaddafi and his subsequent murder at the hands of rebels after a Nato-backed insurrection. On Monday, Pence echoed the president when he said on Monday: "This will only

end like the Libyan model ended if Kim Jong-un doesn't make a deal."

This triggered Choe's statement on 24 May, dismissing Pence's remarks as "stupid" and issuing reciprocal threats. North Korea analysts said there were deeper problems underlying the proposed summit than heavy-handed use of menacing language. ...

Source: <https://www.theguardian.com>, 24 May 2018.

## NUCLEAR SAFETY

### GENERAL

#### How will Artificial Intelligence affect the Risk of Nuclear War?

As technology has progressed, humans have become ever more powerful. With this power comes great opportunity and great risk. Nowhere is this clearer than in the potential of artificial intelligence. But a new report from the RAND Corporation suggests that our misconceptions about what the technology can do may be as dangerous as the technology itself.

If you're a singularity believer, according to the RAND report, "Superintelligence would render the world unrecognizable and either save or destroy humanity in the process." A world with human-level AI could be unimaginably different to the world of today—and difficult to make predictions about. Yet society is trying to adjust to the smart algorithms ("weak AI") that increasingly influence our lives. A recent report outlined the potential for AI capabilities to be used by bad actors.

Nuclear weapons remain, perhaps, foremost in people's minds as an existential threat. The report focuses on how lesser AI might alter the shaky nuclear equilibrium we've been living in since the

**Keep in mind that the nuclear system depends on military communications...and those are vulnerable. To the extent that those could be attacked and manipulated, particularly during a crisis, we may have a problem.**

Trinity Test gave birth to the nuclear age. You might initially imagine there's a risk that a cyberattack, enhanced by AI, could hack into nuclear missiles. There was an alarming moment in 2010 when the US Air Force "lost contact" with missiles

briefly. But this is not a major concern, at least not yet. Although it may seem alarming that the US nuclear arsenal still operates on 40-year-old computers with floppy disks, it means that the control structure is "air-gapped." A closed network, with no access to the internet, is much more difficult to hack.

Stephen Schwartz, an expert on nuclear policy, told in an interview: "The system as currently employed and operating is relatively invulnerable to a cyberattack directly." But he raised a far more chilling concern, one shared by the RAND report: "Keep in mind that the nuclear system depends on military communications...and those are vulnerable. To the extent that those could be attacked and manipulated, particularly during a crisis, we may have a problem."

The one thing to keep in mind with the nuclear weapons command and control infrastructure is when it's designed to be used. For mutually assured destruction—viewed as necessary for an effective deterrent—you need to be able to launch your retaliation within a matter of minutes.

Otherwise, the thousands of nuclear missiles headed towards you could wipe out the chain of command in a decapitation strike, or destroy your ability to retaliate. You have moments to decide. There's not a great deal of time to

**As AI develops, "artificially intelligent advisers" will be a huge temptation for the military—algorithms that can assess the nuclear threat and automatically plan an optimal response in the minutes that are available. But this will bring with it new risks.**

double-check.

Given how quickly decisions have to take place, there's not a lot of time for humans to judge, react, and calculate. This is why, as soon as it was possible, computer early-warning systems have been used. As AI develops, "artificially intelligent

advisers” will be a huge temptation for the military—algorithms that can assess the nuclear threat and automatically plan an optimal response in the minutes that are available. But this will bring with it new risks.

The computers that actually control the missiles are far less vulnerable to error or attack than the communications to and from humans involved in making decisions. The scariest Cold War moments have often come from similar misunderstandings.

**The computers that actually control the missiles are far less vulnerable to error or attack than the communications to and from humans involved in making decisions.**

In 1983, Stanislav Petrov was monitoring the Soviet early warning system when he saw an alert: incoming missiles had been fired by the United States. Had Petrov followed correct military protocol, he would have raised the alarm. But Petrov thought it was unlikely that the US would only attack with a small number of missiles, and failed to do so, potentially averting nuclear war. This is just one incident: similar stories happened again and again and again.

We have been incredibly fortunate that all of these errors were spotted before a nuclear war began. But what if the miscommunication was more convincing? If, for example, deepfake technology was used to imitate the president ordering a nuclear strike? Such are the scenarios nuclear strategists have to ponder. Misconceptions about what artificial intelligence can do can be just as dangerous as AI itself. If people believe their communications can be hacked—even if they’re perfectly secure—how can they trust the orders they’re receiving? Similar concerns were raised by RAND about assured

**What if the miscommunication was more convincing? If, for example, deepfake technology was used to imitate the president ordering a nuclear strike? Such are the scenarios nuclear strategists have to ponder. Misconceptions about what artificial intelligence can do can be just as dangerous as AI itself. If people believe their communications can be hacked—even if they’re perfectly secure—how can they trust the orders they’re receiving.**

destruction: the report states, “Both Russia and China appear to believe that the United States is attempting to leverage AI to threaten the survivability of their strategic nuclear forces, stoking mutual distrust that could prove

catastrophic in a crisis.” If smart algorithms can scan satellite imagery to determine the location of nuclear silos—or just analyze smartphone app data—might the side with better technology be at an advantage, disrupting the balance of power? What if one side believes the other will soon be able to reliably intercept nuclear missiles?

Others at the workshop were more sanguine about this prospect. They pointed out that adversarial examples—slight distortions to input data that are cleverly

constructed to fool a machine-learning algorithm—could always be used to combat an algorithm that’s scanning for retaliatory forces. But this raises a new concern: any “AI adviser” to the military on nuclear weapons would also be vulnerable to such attack. If your machine learning algorithm that scans the skies for nuclear launches can be fooled, it could feed humans in the command and control structure incorrect information. Human error may be the biggest risk, but trusting automated systems and algorithms too much could also prove catastrophic.

The adversarial nuclear relationship between the US and the USSR in the Cold War was defined by both sides trying to second-guess the strategy, intentions, and capability of the other side. Misconceptions about what the other side is trying to do, or what their technology was capable of, can be key to the geopolitical decisions that are made. As progress in artificial intelligence accelerates, confusion about what it makes possible could reignite these fears, leading to hair-trigger nuclear weapons, concern about an “AI gap,”

and an arms race. Arms races often involve speed over safety, which is why many are concerned about races for a superintelligence or autonomous weapons.

At an accelerating rate, important societal functions are being carried out by technologies that only a few people understand. Traditional institutions feel the need to react to this acceleration, but can jump to dangerous conclusions. The new nuclear posture review suggests using nuclear weapons to respond to cyberattacks; but when "cyberattack" is a poorly-defined term, and the origins of these attacks can take a long time to trace, is this policy realistic?

**Russia has built a floating nuclear power station, a project that detractors deride as a "Chernobyl on ice". Built in Saint Petersburg, the Akademik Lomonosov is currently moored in Murmansk where it is being loaded with nuclear fuel before heading to eastern Siberia.**

It is clear that states will not want to divulge their military secrets. Indeed, a certain level of mystery about what can be achieved may well help deter attacks. But we would all benefit from broader understanding of what is and isn't possible with artificial intelligence. Nuclear policy is just another area where the black-box nature of algorithms that few understand can act to destabilize a shaky equilibrium. Now more than ever, we need our experts to communicate with our leaders. ...

*Source: Thomas Hornigold, <https://singularityhub.com>, 28 May 2018.*

**RUSSIA**

**World's First Floating Nuclear Barge to Power Russia's Arctic Oil Drive**

To meet its growing electricity needs in its drive to develop oil resources in remote Arctic regions, Russia has built a floating nuclear power station, a project that detractors deride as a "Chernobyl on ice". Built in Saint Petersburg, the Akademik Lomonosov is currently moored in Murmansk where it is being loaded with nuclear fuel before heading to eastern Siberia.

On 19 May, head of state nuclear power firm Rosatom unveiled the brown-and-mustard-painted facility in the city's estuary as an orchestra played the national anthem.

Rosatom chief Alexei Likhachev hailed the new power station as "a new world first," which he

**The Akademik Lomonosov is set to replace an ageing nuclear reactor and a coal-fired power plant which are both located in Chukotka. 'Nuclear Titanic' - Trutnev said the barge has "the latest security systems and should be one of the safest nuclear installations in the world."**

said "underlines the undoubted leading role of Rosatom and the Russian nuclear energy sector on the global agenda." ...The 144-by-30-metre (472-by-98-foot) barge holds two reactors with two 35 megawatt nuclear reactors that are similar to those used to power icebreaker

ships. The Akademik Lomonosov will be towed in the summer of 2019 to the port of Pevek in the autonomous Chukotka region in Russia's extreme northeast.

The barge can produce enough electricity to power a town of 200,000 residents, far more than the 5,000 live in Russia's northernmost town. But Akademik Lomonosov isn't in Pevek to just keep the lights on in homes. As Russia is forced to push further north into the Arctic in the search for oil and gas, it needs electricity in far-flung locations. "The idea is to have low-capacity, mobile power plants that can be used in the Russian Arctic where

large amounts of electricity aren't needed" and the construction of a conventional power station would be complicated and costly, said Sergei Kondratyev at the Institute for Energy and Finance in Moscow." The alternatives are coal, gas and diesel. But

diesel is very costly," he said, while the gas needs to be delivered as liquefied natural gas or LNG. Vitaly Trutnev, who is in charge of the construction and operation of floating nuclear power stations at Rosatom, said such units would "supply electricity and heat to the most remote regions, supporting also growth and sustainable development." He said use of such floating reactors can save 50,000 tonnes of carbon dioxide emissions per year.

The Akademik Lomonosov is set to replace an ageing nuclear reactor and a coal-fired power plant which are both located in Chukotka. 'Nuclear Titanic' - Trutnev said the barge has "the latest security systems and should be one of the safest nuclear installations in the world."

Activists at the environmental group Greenpeace are not convinced and call for international monitoring. They fear that the Akademik Lomonosov could become a “nuclear Titanic” or a “Chernobyl on ice” 32 years after the Soviet nuclear disaster. Greenpeace Russia’s Rashid Alimov said that accidents are possible at all nuclear power plants, but that the barge “will be especially sensitive to storms, environmental phenomena and threats such as terrorism.”

He said a shift to more numerous small reactors would pose risks for proliferation of nuclear material.

Greenpeace nuclear expert Jan Haverkamp noted that the Akademik Lomonosov is being fuelled near Murmansk, a city of 300,000, before being towed across the Arctic.

“Its installation in the tough environment of the Russian Arctic will pose a constant threat for residents of the north and the Arctic’s pristine nature,” said Haverkamp. The barge had initially been scheduled to be fuelled in Saint Petersburg, but that work was moved to Murmansk instead due to concern in countries along the Baltic Sea. Kondratyev at the Institute for Energy and Finance in Moscow downplayed safety concerns about the barge, insisting it met the same safety rules as nuclear icebreakers and submarines.

“But it is a new piece of equipment. There may be concerns among the general populace, but there are additional risks compared to nuclear power plants,” he said.

Rosatom chief Likhachev said on 19 May that the corporation hopes to build more such barges and to find Asian clients in need of power in remote regions, giving the examples of Indonesia and Philippines. “In certain cases a floating nuclear power plant is more cost-effective than other electric power plants ... it has its own niche,” Kondratyev said.

He said China is also building a floating nuclear power plant.

Source: <https://energy.economictimes.com>

*indiatimes.com, 20 May 2018.*

## **SOUTH KOREA**

### **Household Products in South Korea under Scrutiny for Radioactive Emissions**

Bottom of Form A recent public health scare in South Korea over “radioactive mattresses” found to emit radon nine times the safety standard is spreading to other household products. Radon – a radioactive gas – is emitted by monazite sand, a natural mineral that releases “negative ions.” Manufacturer Daijin Bed applied it to the inner layer of the mattresses for alleged health benefits. Excessive radon exposure has been found to cause lung cancer.

Nuclear Safety and Security Commission data, acquired and released by Democratic Party of Korea Rep. Kwon Chil-seung, shows Daijin Bed’s monazite sand supplier distributed even more of

**The Akademik Lomonosov is being fuelled near Murmansk, a city of 300,000, before being towed across the Arctic. “Its installation in the tough environment of the Russian Arctic will pose a constant threat for residents of the north and the Arctic’s pristine nature.”**

the radioactive substance to three other local firms over the years. One bought 12 tonnes of monazite sand between 2014 and 2018 – almost quadruple the amount Daijin Bed bought between 2013 and 2016 – to produce various “negative-ion” health products like bracelets and

laundry washing balls. Data shows the supplier sold over 40 tonnes of monazite sand over the past five years. According to the nuclear safety commission, this radioactive material was distributed to over 66 local firms. Eleven were linked to household products. “The Nuclear Safety and Security Commission should conduct speedy investigations into firms that bought monazite to prevent future harm,” Rep. Kwon Chil-seung said.

Source: <http://www.scmp.com>, 25 May 2018.

## **UAE-CHINA**

### **UAE and Chinese Nuclear Regulators Sign MoU**

The UAE’s Federal Authority for Nuclear Regulation (FANR) signed a MoU with China’s Nuclear Safety Administration (NNSA) on the cooperation and exchange of information in nuclear safety regulations. The MoU was signed on 24 May on the side-lines of the of the sixth review meeting of the contracting parties to the

joint convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, which is being held in Vienna, Austria, until June 1. The NNSA is China's government agency that was established in 1984 to conduct independent and an objective nuclear safety supervision of civilian nuclear facilities in China and ensure nuclear safety.

The MoU establishes a platform of cooperation between the two nuclear regulators to exchange technical information, cooperate in nuclear safety regulation as well as provide training opportunities for FANR's employees to be trained at the NNSA's facilities. Ambassador Al Kaabi, deputy chairman of FANR's Board of Management and the UAE's permanent representative to the IAEA, and Liu Hua, Administrator of NNSA, signed the five-year MoU.

**The nuclear air filtration market is expanding vigorously along with the development of innovative technological, mergers and acquisitions, rivalry in the nuclear air filtration industry which includes the local as well as regional sellers. However, the new competitors are facing difficulties while competing with the nuclear air filtration international sellers due to their product quality, consistency, and advanced technologies in nuclear air filtration production.**

"Cooperating with international organisations and advanced countries in the area of nuclear regulation is essential for any nuclear safety regulator. Such cooperation supports FANR's efforts as the UAE's nuclear regulator to share experience and continuously enhance its performance. Also, it supports its efforts to build sustainability of the regulatory infrastructure in the UAE." said Al Kaabi. Internationally, FANR has over 19 international agreements and MoUs signed with international organisations and regulatory authorities of other countries to build national capacities, exchange of knowledge and information.

Source: <https://gulfnews.com>, 24 May 2018.

**NUCLEAR WASTE MANAGEMENT**

**GENERAL**

**Global Nuclear Air Filtration Market Analysis 2018**

The research report on the "Global Nuclear Air Filtration Market" for the period 2018 – 2023 offers an outlook of the market over the globe. The main objective of the nuclear air filtration report is to

provide updates and opportunities inside the market. The global nuclear air filtration market research report 2018 describes the market value in 2017 was USD XX million and is anticipated to reach at USD XX million over the forecasted period 2018 – 2023, holding a qualitative growth towards CAGR of XX% based on different limitations involved in the nuclear air filtration business strategies, productivity, end-user stats and regional analysis.

The report offers analysis of the nuclear air filtration market from 2013 to 2017 and projects the futuristic market tendencies over the period of 2018 – 2023. In addition, the report observes deeply manufacturing structure, nuclear air filtration revenue generated, gross margin, analyzes the regional zones, nuclear air filtration supply and demand, import and export activities, consumption,

nuclear air filtration business driving factors, advanced technology and major upcoming market opportunities. The next section of nuclear air filtration report, team efforts have been utilized to find out the in-depth policies of the market players, nuclear air filtration industry geographical presence, products and applications related to the global nuclear air filtration market report. Further, the new entrant or competitors who would like to glance at the nuclear air filtration market to understand the industrial breakdown, and stay updated with nuclear air filtration market knowledge related to a variety of aspects significant in the competitive market.

**Nuclear Air Filtration Market Competitive Landscape:**

The nuclear air filtration report summarizes the company profile, portrays the product, specifies the market share and sales volume, company contact information of the nuclear air filtration market top listed market players .... The nuclear air filtration market is expanding vigorously along with the development of innovative technological, mergers and acquisitions, rivalry in the nuclear air filtration industry which includes the local as well as regional sellers. However, the new competitors

are facing difficulties while competing with the nuclear air filtration international sellers due to their product quality, consistency, and advanced technologies in nuclear air filtration production.

***Nuclear Air Filtration Market Segmentation:*** The global nuclear air filtration market is divided by type of product such as Portable and Stationary, along with the production cost, nuclear air filtration sales revenue, demand, and supply strategy, the scope of individual product from 2013 to 2017, nuclear air filtration market volume and various other stats included in the manufacturing activity. The nuclear air filtration report study is further divided on the basis of end user: Nuclear Fuel Handling Device, Nuclear Generator, Nuclear Waste Management and Nuclear Energy Research Facility including the consumption, studies the past and future prospects of the nuclear air filtration market share from 2013 to 2017 as well

the CAGR structure.

The global nuclear air filtration market report is categorized on the basis of major geographical regions including consumption, nuclear air filtration production, income (USD million), and market stake, also growth rate of nuclear air filtration in these regions, from 2013 to 2023 (forecast), covering the markets of North America *The US, Mexico* and Canada, its market share (%) and CAGR value respectively, nuclear air filtration market in covers Europe France, *Germany, UK* and Italy, Asia Pacific Japan, China, South Korea and *India*, in the last nuclear air filtration market in South America and the Middle East and Africa respectively. ...

Source: <https://theexpertconsulting.com>, 25 May 2018.



Centre for Air Power Studies

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

Centre for Air Power Studies

P-284

Arjan Path, Subroto Park,  
New Delhi - 110010

Tel.: +91 - 11 - 25699131/32

Fax: +91 - 11 - 25682533

Email: [capsnetdroff@gmail.com](mailto:capsnetdroff@gmail.com)

Website: [www.capsindia.org](http://www.capsindia.org)

**Edited by: Director General, CAPS**

**Editorial Team: Dr. Sitakanta Mishra, Hina Pandey, Anushree Dutta, Dr. Poonam Mann, Wg Cmdr Kaura, Sreoshi Sinha**

**Composed by: CAPS**

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