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OPINION – Manpreet Sethi

China Rides on Pak to Further its Nuclear Power Export Ambitions

In March 2021, Unit 2 of the Karachi nuclear power plant, the 1014 MW Kanupp-2, was synchronised with Pakistan's electricity grid. Under construction since 2015 as part of an agreement signed in 2013 between China National Nuclear Corporation and Pakistan Atomic Energy Agency, the reactor took the national share of nuclear electricity from 5% to 9%. This sixth nuclear reactor is also Pakistan's largest. The other five operational reactors range from a capacity of 100 to 340 MW, together producing a mere 1,430 MWe.

While this reactor has added to Pakistan's electricity generation, the development is of no less significance for China. It is the first fully designed Chinese reactor, Hualong One, to be built outside the country. Beijing plans to export this as HPR1000 and the extensive help rendered by China to Pakistan's nuclear power programme over last three decades helps China to showcase its nuclear prowess.

China-Pakistan agreement for civilian nuclear cooperation was first signed in 1986. This resulted in construction of a 300 MW reactor at Chashma that became operational in 2000. Subsequently, three more reactors had been built at this site by 2017, and another has

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since been announced. Meanwhile, the 2013 agreement was for construction of two Hualong One reactors at the Karachi site, where a 137 MW reactor, built under the US Atoms for Peace programme, is operational.

A majority of the reactors offered by China to Pakistan are in violation of China's commitments under the NSG. NSG allows civilian nuclear cooperation with only those countries that accept full-scope safeguards over their nuclear programme. Pakistan does not. Nevertheless, China has "grandfathered" new reactors under the 1986 agreement, though it had not announced any such commitments while joining the NSG in 2004. Additional reactors are obviously an afterthought,

borne out of an understanding that nuclear cooperation suits both sides.

For Pakistan, expansion of nuclear power helps to

better balance its energy mix that is presently heavily skewed in favour of imported natural gas. 40% of its electricity comes from this one source. Hydropower is at second place at 25%, with little scope for further growth. Interestingly, despite substantial coal reserves, though of poor quality,

Pakistan has traditionally not invested much in coal-fired power plants. This has allowed it to remain amongst the lowest carbon emitters. But this could change once the 21 energy projects that China has contracted under CPEC, three-quarters of which are coal-based, become operational. To reduce GHG emissions and meet Paris agreement

targets, Pakistan will have to turn to renewables and nuclear energy. The latter is currently available to it only from China. Besides, China's support helps Pakistan in its constant efforts to "equalize" itself with India on all matters nuclear. So, to match the NSG waiver granted to India in 2008, Pakistan has sought the same benefits through its relationship with China.

For China, the benefits of civilian nuclear cooperation play out at several levels. Firstly, Beijing earns the goodwill and gratitude of Islamabad for cooperation in an area otherwise denied to it. Secondly, the "specialness" of the relationship enables China to encash on other lucrative energy deals in Pakistan. And, given the Chinese model of infrastructure build-up, benefits are likely to flow more to its own private sector than the recipient nation.

Thirdly, the cooperation lets China set its equation with the US. Just as Washington facilitated India's accommodation into the non-proliferation regime,

Beijing believes it can and must assert its right to do the same for its "iron brother", even at the cost of flouting NSG guidelines. In fact, that is supposed to demonstrate its global standing at par with the US.

Lastly, but most importantly, the successful construction and operation of its nuclear reactors in

Pakistan gives China the opportunity to validate its designs for exports and showcase itself as a credible supplier for the 28 countries with whom it has signed nuclear cooperation agreements. Ironically though, China appears to be riding its nuclear export ambitions on a cooperation, which is itself built on a blatant violation of non-

proliferation rules. The fact that China could violate NSG guidelines and that the global nuclear order could not check it calls for some serious thinking about the nuclear order.

This could be a matter of greater concern since many of the countries with whom China has signed nuclear deals are newcomers, such as Cambodia, Egypt, Kenya,

South Africa, Sudan, Thailand, Uganda, etc. Given the nature of nuclear technology, it is important for a nuclear supplier to help first-timer recipients to suitably prepare through activities such as conduct of environmental impact assessments, drafting legislation, setting up independent regulatory mechanisms, establishing safety and security processes, building trained workforce, etc. It may be recalled that when the US started the Atoms for Peace programme in 1953, it also helped to build governance structures like the IAEA. Will

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China, with its habitual disdain for global rules of governance, insist on time-consuming procedural requirements or set its own standards of safety, security and non-proliferation?

Needless to say, laxity in any aspect of nuclear governance that results in an adverse incident would globally affect public perception about nuclear energy and impact the nuclear industry. It would also strike a blow to the utilisation of nuclear energy as a carbon-neutral source at a time when it is being considered for a role in transition to a carbon-free world. Therefore, while China may be in a hurry to go global, it must be asked to behave more responsibly and show greater compliance with the global nuclear governance framework than it has done till now.

Source: Sunday Guardian Live, <https://www.sundayguardianlive.com/opinion/china-rides-pak-nuclear-power-export-ambitions>, 03 April 2021.

OPINION – Shailendra Deolankar

Nuclear Energy: A Critical Pillar Enriching India-Russia Relationship

In the field of civil nuclear energy, the scope of India-Russia cooperation is constantly gaining momentum. Although culture, defence, anti-terrorism cooperation, and space have historically been the cornerstones of the Indo-Russian strategic partnership, civil nuclear energy is playing a critical role in shaping India and Russia's bilateral ties.

It has been underlined that India and Russia share a time-tested relationship. Russia has been one of India's closest allies for the past six decades. Every passing year ensures that the relationship remains as strong as it was in the past. Over the years, India and Russia have preserved a strong civil nuclear energy partnership.

Even during the Cold War, the India-Russia relationship was unique, distinctive, and multifaceted. Historically, whether it was a political emergency, economic crisis, or

technological assistance, or to develop basic industrial infrastructure, or whether India needed to back up its diplomatic position at the United Nations, Russia has aided India in a multi-dimensional way.

Every country has a character that reflects in its ideology, outlook, and approach towards other

countries in terms of foreign policy. Based on these characteristics, the nation constructs its identity. Geopolitical blocs and coalitions are formed as a result of these constructs. India-Russia relations have not only stood the test of time but have also seen an increasing convergence of interests in the post-cold war era upheaval.

The Russian nuclear industry is looked at as an undisputed leader in advanced nuclear technology, offering cutting-edge engineering and design solutions in the domain of advanced nuclear reactors and nuclear fuel manufacturing. India began its three-stage nuclear power program to meet the country's defence and energy needs after independence. India has made significant progress in the area of nuclear energy since then. Going ahead, Russia emerges as a crucial partner for pushing India's nuclear energy potential.

Furthermore, both countries have a shared vision in mind when it comes to the theme of 'Multi-Polar Asia. Russia validates its worth by stretching its helping hand to India, assuring long-lasting friendship. Since 1947, Russia has contributed to the political and economic strengthening of India through various means. This assistance has been vital to India's overall growth in the modern age.

Over 60 percent to 70 percent of India's armed forces are equipped with arms of Russian origin. As part of the Make in India initiative, Russia is also a key partner for the manufacturing of defence equipment in India.¹ It is undeniable that Soviet military assistance aided India's rise to prominence as a major military force in Asia. The buyer-seller partnership between India and Russia has evolved into a strong security collaboration over the last decade.

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The defence collaboration between India and Russia entails joint research and development, design, and defence manufacturing. Both countries have developed a formalized system for technology transfer and joint production. In the last few years, several significant agreements have been reached. These facts highlight the significance of Russia from an Indian outlook.

Along with the defence industry, the nuclear energy sector is advancing newer dimensions to the India-Russia cooperation. India's position on nuclear energy, which is to use it for peaceful purposes, makes it a trustworthy consumer of nuclear energy. Since independence, India has demonstrated its commitment to using nuclear energy only for sustainable development. India's policy commitment encourages countries like Russia to support India with smooth technology transfer and advanced nuclear energy projects.

In Russia, the nuclear energy sector is seen as a top national policy priority, enabling Russia to emerge as the undisputed leader in advanced nuclear technology. To that effect, India can further its nuclear energy collaborations with Russia to rope in best global practices on Indian soil. India-Russia joint endeavour in this regard is the Kudankulam nuclear power project. Furthermore, Russia has announced that it aims to develop more than 20 nuclear power plants in India over the next 20 years. 2

Nuclear power companies all over the world are now following sustainable and renewable energy principles. For more than 75 years, Russia's State Atomic Energy Corporation, ROSATOM, has been at the forefront of nuclear power technology.

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Nuclear cooperation between the two countries is also contributing to advance the government's "Make in India" initiative, as some critical components are gradually being manufactured in India. India's vision of Atmanirbhar Bharat aims

to transform the country into a global manufacturing hub. Consequently, as India's manufacturing capacity increases, so will its energy demand. According to data, India's nuclear power generation capacity of 6,780 MW is expected to be increased to 22,480 MW³. Sustainable energy sources, such as nuclear

power, would be critical in realizing a comprehensive Atmanirbhar Bharat's vision of becoming a global manufacturing hub. Russia's decades of experience in developing sophisticated nuclear technology, along with years of strong India-Russia bilateral ties, positions Russia as a suitable partner for boosting India's growing civil nuclear energy

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Source: <http://www.businessworld.in/article/Nuclear-Energy-A-Critical-Pillar-Enriching-India-Russia-Relationship/09-04-2021-386157/>, 09 April 2021.

OPINION – Manpreet Sethi

Early Nuclear Indicators in the US' Interim National Security Strategic Guidance

President Joe Biden's administration has been quick off the mark to retrieve control on many domestic and foreign policy fronts: reining in the

COVID-19 health emergency, extending New START, reassuring allies on US commitment to extended deterrence, reinforcing partnerships, looking for ways to reinstate the Iran deal, and generally engaging with the world 'once again'.

Another important action taken is the announcement of the Interim National Security Strategic Guidance (INSSG). The 24-page document is meant to explain the administration's worldview, identify its priorities, and provide pointers on how it plans to deal with challenges and seize opportunities to further US national interest. This is a sort of a trailer to the longer and more detailed National Security Strategy (NSS), which is under preparation and likely to be released only towards the end of 2021 or early 2022.

Expectedly, the INSSG does include a few paragraphs on the US' contemporary nuclear threat perceptions and the capability requirements to address them. Russia, China, North Korea, and Iran continue to be identified as major threats. They are the drivers for the US' sustained deterrence posture. The document reiterates the commitment that the American "strategic deterrent remains safe, secure, and effective and that our extended deterrence commitments to our allies remain strong and credible." It does not go into any detail about the kind of investments in nuclear weapons or delivery systems modernisation that Washington will focus on. That, of course, will be the prerogative of the Nuclear Posture Review that is likely to follow the NSS. However, the usage of some words

in the INSSG reveals the contours of an approach that is expected to be quite different from that of the previous administration on matters nuclear.

The INSSG, for instance, refers to the danger posed by nuclear weapons as an "existential threat."

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This indicates an acknowledgement of the seriousness with which the risk of use of nuclear weapons is perceived; akin to putting the existence of civilisation in peril. In a further recognition of the risks so posed, the document also expresses a desire to "head off costly arms races and re-establish our credibility as a leader in

arms control." Clearly, President Biden is signalling a desire to step out of the offence-defence cycle by searching for new avenues for arms control and to engage on strategic stability talks with Russia and China, especially on emerging technologies and their impact on nuclear deterrence. The devil in such issues will obviously lie in the details of agreements that will not be easy to negotiate and conclude. However, the sentiment behind such an expression does restore

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faith after the kind of actions taken over the last four years that virtually destroyed the existing arms control architecture and behavioural norms.

Biden has also mentioned his interest in reducing the role of nuclear weapons in national security. This will allow room to rationalise the nuclear modernisation budget in the coming years,

which is currently projected at a staggering US\$ 2 trillion. The US has made it clear that it would like to increase its investments in cutting-edge technologies and capabilities while shaping ethical and normative frameworks to ensure their responsible usage. This will require the US to lead

by example, since China and Russia have been quick to develop symmetric or asymmetric responses to counter the perceived American threat from every new capability. The US direction on these issues does matter and it remains to be seen whether and how a change of track by the Biden administration will alter the overall global mood.

The issue of nuclear security also has found mention in the INSSG as the administration has expressed an intention to “renew efforts to lock down fissile and radiological materials across the world.” This is important since the threat of nuclear terrorism persists. Handling the threat requires international cooperation, and better relations between major nuclear powers will be helpful.

A “renewed American non-proliferation leadership” is also promised in looking for solutions to address the Iranian nuclear programme and North Korea’s growing nuclear and missile programmes. While a return to the JCPOA appears to be of priority—and the US can be expected to explore ways of doing so through quiet diplomacy—dealing with Pyongyang will require a different approach. Given the nature of Kim Jong-un’s leadership and his desire for public diplomacy with the US, the Biden administration will have to find innovative ways of engagement to seduce him back into the non-proliferation regime. An ideal outcome would be to get North Korea to accept a freeze on further missile developments and fissile material production, preferably under IAEA safeguards. Innovative trade-offs will have to be thought of, including making it worth the while

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Every new administration in every country inherits its share of challenges. The US, given its global footprint, obviously has a large share of issues to address. Its current slew of challenges has also been exacerbated by the rather disruptive thinking and actions of its previous president who took Washington’s nuclear policies down certain new alleys. Retracing the steps back into sane and stable deterrence will require some effort. The INSSG appears to have taken the first baby step.

Source: Institute of Peace and Conflict Studies, http://ipcs.org/comm_select.php?articleNo=5759, 05 April 2021.

OPINION – John McLaughlin

On Nuclear: Iran and North Korea are a Package Deal

The Biden administration has begun cautious exploratory talks with Iran and other signatories to revive the 2015 agreement that limited Tehran’s nuclear work. As a practical matter, the U.S. has to tackle nuclear issues one at a time, but it is very hard to separate Iran’s nuclear and missile ambitions from those of North Korea. Eventually, our diplomats will have to treat the two as a “package deal” because of the close ties the two countries have nurtured over decades — ties that can give each some bargaining leverage and some insulation from Washington’s efforts to pressure them or deny them access to expertise and material.

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The talks with Iran are exploratory and indirect,

meaning American and Iranian representatives are not always at the table but will communicate on a menu of options through diplomats from the U.K., France, Germany, Russia, China and the European Union.

The ambition on the U.S. side appears to be to map out a series of reciprocal steps whereby Iran would gradually restore compliance with the agreement in exchange for gradual relaxing of U.S. and international

economic sanctions. Since Trump's withdrawal from the accord in 2018, Iran has begun enriching uranium to higher levels and in larger quantities than the agreement permits. The IAEA says Iran has now accumulated about 12 times the enriched uranium permitted under the 2015 agreement, steps Iran says it can reverse — for a price.

So far, Iran has stuck to its position that the U.S., as the party that left the accord, is obliged to first lift all the sanctions before Iran has to do anything. Robert Malley, appointed by President Biden as Special Envoy for Iran, has been very careful to keep expectations low and to signal that Washington will not make concessions easily.

There are no comparable talks currently planned with North Korea, but the Biden administration continues to weigh the options. Pyongyang is much further along than Iran on both nuclear weapons and missiles. On the nuclear side, the U.S. Army says the North has 20 to 60 nuclear warheads and the ability to make about six per year.

The North also appears close to achieving a workable ICBM based on tests it conducted in 2017. Its largest tested missile, the Hwasong-15, reportedly reached an altitude of 2,780 miles; scientists estimate that if this lofted shot was

flattened out in a normal trajectory, it could reach most parts of the United States. Although experts assume the North can attach nuclear warheads to its missiles, they doubt it has an effective guidance system or has mastered the technology to ensure the survival of its final stage through the heat of atmospheric reentry.

Cooperative relations between the two countries go back decades and continue now to contribute to Iran's missile progress in particular. Starting in the

1980s, Iran began acquiring missiles and designs from North Korea; Iran's Shahab-3 medium-range missile, with a range of 1,200 miles, is essentially a version of North Korea's No Dong weapon. In 2016, the Obama administration treasury department issued a sanctions notice indicating that Iran and North Korea were working on a large rocket engine that appears to be the engine North Korea used in its successful 2017 tests of its largest ICBM.

Iranian acquisition of this engine could hasten its efforts to increase the ranges of its missiles, which currently top out at 1,200-1,800 miles. A U.N. panel of experts, moreover, issued a report last month noting that such missile cooperation was continuing.

On the nuclear front, much of the information is fragmentary and given more weight by U.S. opponents of the Iran nuclear accord than by its advocates. But it is fair to say that some level of nuclear collaboration has been underway for more than a decade. Each side

has expertise the other wants — Iran on uranium centrifuge enrichment (North Korea relied on plutonium in its early nuclear work), and North Korea on nuclear warhead design. South Korea claims that North Korean experts have worked at Natanz, one of Iran's premier nuclear hubs, and the IAEA has reports that the North transferred to

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Iran mathematical formulas and codes for nuclear warhead design. And in the early part of the last decade, North Korea helped Iran's ally Syria build a nuclear plant, destroyed by Israel in 2007.

The bottom line: The Biden team is right to give first priority to Iran, because it can still be deterred from the nuclear path that North Korea has already taken. But when the administration turns to North Korea later, it will have to include among its goals measures to guard against Pyongyang diluting or undoing whatever progress it may have made with Iran.

Source: *The Cipher Brief*, https://www.thecipherbrief.com/column_article/on-nuclear-iran-and-north-korea-are-a-package-deal, 09 April 2021.

OPINION – Holly Dagues

The Biggest Impediment to a New Nuclear Deal with Iran? Domestic Politics

The United States and Iran are in a staring contest, and neither wants to blink first – at least that's how the BBC Middle East editor, Jeremy Bowen, described the current political impasse.

Since president Joe Biden took office on 20 January, the countries have been locked in a stalemate over the JCPOA, which the Donald Trump administration withdrew from in May 2018, reimposing sanctions on Iran – despite the country not having violating the multilateral accord. These actions prompted Iran to speed up its nuclear programme after May 2019 by incrementally breaching aspects of the JCPOA.

With both Iran and the United States signalling a desire to return to the deal, one might think the path back was fairly straightforward. But it's full of landmines otherwise known as "domestic considerations". Neither wants to take a false step that could blow up back home.

On 06 April, apparent progress was made, with

both parties meeting in Vienna (albeit staying in separate hotels) alongside the remaining signatories known as the P4+1: Britain, China, France, Russia and Germany. It was the first time the US has been present at a multilateral meeting with Iran since Trump left the accord.

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For the past few months, the US and Iran have been mirroring each other's demands. The Biden administration has reiterated that the United States will return to the deal and lift nuclear-related

sanctions if Tehran returns to strict compliance. Iran has reiterated it will do so once Washington removes sanctions – specifically those on oil and banking. Though there was no "immediate breakthrough", in the words of State Department spokesman, Ned Price, another meeting is slated for 09 April.

Much of the nascent Biden administration's focus during its first 100 days in office was, and continues to be, on the US economy and coronavirus pandemic, which includes the passing of a \$1.9tn stimulus package in March and a \$2.3tn infrastructure plan currently in the process. It's also assembling its team and getting political appointees approved by Congress.

The chair of the Senate foreign relations committee, senator Bob Menendez, holds the keys to confirming members, key players such as ambassador Wendy Sherman, the former lead nuclear negotiator, who is the nominee for deputy secretary of state. Menendez has a "history of making matters difficult for presidents", and was never a fan of Barack Obama's policy of diplomatic engagement with Iran. This has already started to play out with Biden's pick for undersecretary of defence for policy, Colin Kahl, an Obama-era appointee who also played a role in securing the nuclear deal. Kahl is receiving bipartisan pushback in part for his support of the JCPOA.

On 25 March, Menendez was one of 43 signatories to a bipartisan letter calling on Biden to seek a

broader deal with Iran that would encompass its ballistic missile programme and regional activities, which is also a view shared by some US officials within the administration.

Meanwhile, in Iran, there are domestic politics at play, too. The presidential election is on 18 June, which is in part why the Vienna meeting finally took place. There is concern, especially among European signatories – Britain, France, and Germany – that the window for engagement over the JCPOA may soon close for months. Iran typically doesn't make big decisions once election campaigning kicks off and until a new administration settles in office.

The status of the nuclear deal and sanctions will be a big topic during televised state media debates and will be used as a way to denigrate moderate candidates. The hardliners, a faction that was always vehemently against the multilateral deal, now call the JCPOA one of President Hassan Rouhani's biggest failures. Many analysts are betting on a hardliner to win the June vote in what is expected to be a historically low election turnout.

There is also a swift push for a return to the deal because of a law passed by Iran's parliament in December 2020, after the assassination of the country's top nuclear scientist. The law requires, among other things, that Iran withdraw from the additional protocol, which prevents short-notice inspections of nuclear sites. On 21 February, Iran secured a three-month interim inspection agreement with the IAEA. The hardline-dominated parliament quickly pushed back and accused the Rouhani government of "bypassing the law". This could indicate that hardliners may want to take

credit for ending the political impasse under a new government.

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The biggest worry right now among diplomats and analysts alike is that, if this stalemate continues with neither the US nor Iran budging, it could become harder to revive the current deal. It doesn't help that Iran believes that Biden is practising the Trump administration's "maximum pressure policy" in all but name.

As a result of that very policy, Iran's economy is in dire straits. However, the US's economic leverage is starting to dissipate, with talk of South Korea unfreezing almost \$7bn in assets held in one of its banks, and the signing of a 25-year strategic accord with China – in which Beijing promises to invest \$400bn in exchange for cheap oil. The Iranian economy is adjusting to the shock of sanctions, and the International Monetary Fund and World Bank predict 1.5% to 3.2% growth. Iran may end up taking all the time it needs to not blink first.

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Source: The Guardian, <https://www.theguardian.com/commentisfree/2021/apr/08/nuclear-deal-iran-jcpoa-washington-tehran>, 08 April 2021.

NUCLEAR STRATEGY

INDIA

Navy to Seek Nod for Expansion of Nuke, Diesel Submarine Fleet

The Indian Navy intends to approach the government for authorised force levels of nuclear-powered and diesel-electric attack submarines in addition to the ballistic missile submarines with SFC, people familiar with the matter said on 07

April. The navy's new plan, inspired by a similar cabinet authorisation for 42 squadrons of the Indian Air Force, will seek approvals for six nuclear-powered attack submarines and 18 diesel attack submarines, a South Block official said.

The authorisation for the diesel subs would include those with an air-independent propulsion system, or AIP, which ensures these submarines can remain under surface for a longer period and are quieter than the nuclear-powered submarine. The proposed move comes at a time the Navy is finalising plans to seek approval from the Defence Acquisition Committee to build six nuclear-powered attack

submarines, or SSNs, as part of the defence establishment's continuing focus on expanding the Navy's capabilities to counter the rise of China's navy in the Indian Ocean Region and beyond.

India currently has only one Akula class SSN on lease from Russia, Akula-II nuclear-powered attack boat INS Chakra, and 15 diesel-electric submarines, including the Scorpene-class submarine INS Kalvari. While three of the Kalvari class submarines have been commissioned, the remaining three will be fitted with the AIP system that makes the submarine more lethal than SSNs because its low radar signature minimises the possibility of detection.

The SSNs play a huge role in sea denial to the adversary and have the capability to remain under the sea without surfacing except for replenishing food stocks and other logistics. The Indian SFC, which is part of the Nuclear Command Authority and is responsible for the management of the

country's strategic nuclear weapons stockpile, has one 6,000 tonnes SSBN INS Arihant. The next SSBN, INS Arighat, is set to be commissioned in 2022, the 75th year of Independence and will have K-15 and K-4 nuclear-capable submarine-launched intermediate-range ballistic missiles on board.

The K-15 is expected to have a range of up to 1,500 km while the K-4 is likely to have a maximum range of 3,500 km. Both missiles are being developed by the Defence Research and Development Organisation, or DRDO.

The DRDO also has long-term plans to develop and test-fire the K5 missile, which will have a range of 5,000km, the same range as the Agni-5 surface-to-

surface missile. The SSBN is the most potent of the nuclear triad due to its survival capabilities and forms the backbone of India's second-strike

capability due to its NFU policy as spelt out in the draft nuclear doctrine.

India's strategic ally France is willing to jointly design and develop SSNs with India, a partnership that will assume importance when Prime Minister Narendra Modi goes to Paris to hold a bilateral summit with President Emmanuel Macron after the completion of the India-EU summit at Lisbon on May 8.

summit with President Emmanuel Macron after the completion of the India-EU summit at Lisbon on May 8. The French SSNs are based in Toulon in southern France, and its ballistic missile submarines in the port city of Brest in northwestern France.

India's national security establishment is already in touch with its French counterparts to ensure that the Indian Navy builds up enough deterrence in the Indo-Pacific in the face of the rapidly expanding PLA Navy. The Indian Navy expects the

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PLA Navy to start sending carrier strike force patrols to the Indian Ocean by 2023.

Source: Shishir Gupta, <https://www.hindustantimes.com/india-news/navy-to-see-nod-for-expansion-of-nuke-diesel-submarine-fleet-101617845572473.html>, 08 April 2021.

INDIA-CHINA

Nuclear Escalation between India and China Unthinkable: Swedish Defence Think Tank's Report

A nuclear escalation between India and China is not only unlikely but also unthinkable, said a report of the SIPRI on 'South Asia's Nuclear Challenges' based on interviews with 119 experts from India, China, the US, Russia and Pakistan. "Among Chinese and Indian experts, there was a prevailing view that they shared the same stance on no first use, and that nuclear escalation between the two countries was not only unlikely but also unthinkable" the Swedish think tank said in its report.

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The interviews of 119 political, military, nuclear and regional experts were conducted between May and August 2020. Many of those interviewed were serving military officials. India and China have been involved in military tensions in Eastern Ladakh since early May last year. Even though a disengagement has taken place in Pangong Lake — the biggest flashpoint, de-escalation and de-induction is yet to take place across the region.

Greater India-China Dialogue Needed: However, the SIPRI report states that India only has a superficial understanding of China's motives. "On China, experts argued that India only superficially understands its opponent. Several nuclear and political experts lamented the lack of a routine China-India nuclear dialogue as detrimental to enhanced mutual understanding," the report mentioned.

Even with recent progress — as with the February 2021 India-Pakistan joint statement on the ceasefire at the border and withdrawal of Chinese

and Indian forces from the Pangong Tso Lake area in the aftermath of the Galwan River Valley skirmishes — systemic problems remain that suggest the need for more flexible and sustainable dialogue mechanisms, the report added.

The report highlights that both countries were on the same page when it came to nuclear posture, with the 'no first use' doctrine as just one example. "While stabilizing in the context of recent tensions at the China-India border, the assumption that both parties are operating from the same starting point merits greater attention, in relation not just to no first use but also a range of nuclear postures from de-mating to targeting," the report stated.

US-India vs Pakistan-China? On the two-front threat to India from China and Pakistan, the report says that greater consideration of how deterrence operates among these three countries is needed, even

if it requires more countries at the table. Among Indian and American experts, there was a shared concern that Chinese entanglement of conventional and nuclear platforms and command and control could filter into Pakistan's posture and planning.

Among Chinese and US experts, there was a strong tendency for each to see the other country as playing a larger and more destabilizing role in South Asia. While citing past US weapon sales to the region and the 2005 India-US nuclear deal for their role in strengthening India and freeing up its nuclear material for military aims, Chinese experts also focused on forward-looking initiatives such as the US Indo-Pacific Strategy and the Quadrilateral Security Dialogue, which have a focus on China as well as India.

Among US experts, China's outreach to Pakistan in terms of conventional and nuclear assistance, military training and more recently the China Pakistan Economic Corridor under the BRI demonstrate China's far-reaching aspirations in the region, the report said. ...

Source: *Abhishek Bhalla*, <https://www.indiatoday.in/india/story/nuclear-escalation-between-india-and-china-unthinkable-swedish-defence-think-tank-s-report-1786210-2021-04-01>, 01 April 2021.

SOUTH KOREA

South Korea Talks with China, Japan, and US in Flurry of Diplomacy

After North Korea launched both ballistic missiles and short-range cruise missiles, South Korea held high-level meetings with officials from China, Japan, and the United States. Seoul's National Security Chief Suh Hoon was at the U.S. Naval Academy near Washington, D.C. on April 2 to discuss North Korea issues with his Japanese and U.S. counterparts. The meeting was held after North Korea tested missiles in violation of United Nations Security Council resolutions.

In the meeting, the three national security chiefs reaffirmed their commitments to jointly respond to North Korea's nuclear issue and agreed that full implementation of U.N. Security Council resolutions is essential. Suh said the three officials shared concerns about "North Korea's nuclear and ballistic missile programs" and reaffirmed their commitments to respond and resolve the issue through joint cooperation between the three countries toward the denuclearization of the Korean Peninsula. The meeting was an exchange of opinions as part of a U.S. policy review on North Korea, which has been underway since the inauguration of President Joe Biden.

With Washington's new policy toward North Korea about to be finalized, some experts in Seoul have warned that South Korean President Moon Jae-in's way of dealing with the North is no longer effective. Since former U.S. President Donald Trump failed to reach an agreement with the North Korean leader Kim Jong Un at the Hanoi Summit

in 2019, Moon has made no progress on inter-Korean relations or denuclearization.

Kim Yo Jong, the sister of the North Korean leader, and other senior North Korean officials have made statements to criticize the Moon administration in recent weeks. Experts predict that the Moon administration's efforts to bring the North back to negotiating table will not succeed, as Moon has only about a year left before the end of his term.

Meanwhile, Washington and Tokyo confirmed that the Japanese Prime Minister Suga Yoshihide will attend a summit with Biden on April 16 at the

White House. Seoul and Washington reconfirmed the need for a face-to-face summit and continue to discuss the timing of such a bilateral meeting. Experts predict that if the leaders of the two countries hold a summit, they will likely have a plan before the G-7 Summit in June. However, with the COVID-19 pandemic still complicating diplomacy, no specific time

and date have been set.

While Seoul's national security chief was meeting with his Washington and Tokyo counterparts, South Korean Foreign Minister Chung Eui-yong met his Chinese counterpart Wang Yi in Fujian province on April 3. The meeting was originally expected to last about an hour but it reportedly took about an hour and 40 minutes as Chung and Wang discussed a broad range of issues.

Chung and Wang discussed the denuclearization of the Korean Peninsula and ways to establish a peace regime at the meeting. Also, they exchanged detailed opinions on ways to boost cultural exchanges, which have shrunk over the past few years, and environmental issues such as cross-border air pollution.

After the meeting, Chung said to reporters that they had shared in-depth opinions on how to

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advance the peace process on the Korean Peninsula. He also stressed that they both agreed to soon hold 2+2 talks between their foreign and defense ministers.

In the meeting, Wang expressed Beijing's support for Seoul's permanent peace policy and complete denuclearization policy on the Korean Peninsula, according to reports. With that, Chung asked Beijing to play a constructive role in achieving the two main goals based on cooperation and pushed for Chinese leader Xi Jinping's visit to Seoul as soon as the coronavirus situation stabilizes. Xi had been expected to visit South Korea in 2020 before COVID-19 halted nearly all international travel.

As North Korea has continued developing its missile programs and nuclear power, however, South Korean experts have doubts that China will coordinate with Seoul to now end those programs. Considering the geopolitical and economic interests bound up with China, South Korea has no choice but to cooperate with Beijing. However, experts say that South Korea should be on the same side as the United States as it pushes back against China. Chung and Wang also exchanged opinions on the issue of the China-U.S. conflict. A South Korean Foreign Ministry official said to local reporters that China is also an important country as it is the largest trading partner for South Korea, but emphasized that the United States is South Korea's most important ally. This remark was interpreted as confirmation that Seoul will take a neutral stance between the two superpowers, but it will be a challenge for Seoul to stay neutral when Washington asks it to participate in alliance cooperation aimed at containing China, such as being part of the Quad.

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*Source: Mitch Shin, The Diplomat, [## **RUSSIA**](https://thediplomat.com/2021/04/south-korea-talks-with-china-japan-and-us-in-flurry-of-diplomacy/?mkt_tok=MDk1LVBOVi04MTM AAAF8R9sjJp 5Dkp_wYUcXbEQfBsVe28OYSJzcmb A4rlbBU feknzBGGefDPRBJRh-KwBDBSOq2ATKlp-t5XkBWa_dmViCvzGvIW H6CScU5fmMC5F5-XQ, 05 April 2021.</i></p></div><div data-bbox=)*

Russia Moves Ground Troops, Ballistic Missile Systems Near Ukraine Border – British Analysts

British defense analysts said on 08 April they have identified Russian ballistic missile systems deployed alongside over a dozen tank and rocket launcher units on the Ukrainian border amid concerns of renewed hostilities. Military monitors and the White House say Russia has amassed the largest concentration of forces near eastern Ukraine since the conflict between Ukrainian forces and pro-Russian separatists first broke out in 2014. Kremlin officials said the movements were non-threatening but warned that an escalation of hostilities would mark "the beginning of the end" for Ukraine.

The Janes defense publication said it located through open-source intelligence at least 14 Russian Armed Forces units, including Iskander short-range ballistic missile systems, that have moved or are moving to the Ukrainian area of operations since late March. "While Russia's intentions are still unclear, this movement stands out as possibly the largest unannounced movement of troops since Russia's invasion of Crimea and eastern Ukraine," it said. "The true extent of the cross-military district deployments also remains to be seen."

Russia uses the nuclear-capable, high-precision Iskander system primarily to attack troops and hardware in a frontline fight. The missiles can be guided by troops sighting targets, by satellites or by unmanned aerial vehicles at a range of up to 500 kilometers.

Janes' report adds further details to earlier analysis by a group of Russian military bloggers known as the Conflict Intelligence Team (CIT) that Russia has deployed motorized rifle, artillery and airborne units near Ukraine. Using online freight tracking services, the CIT said it located Russian troops arriving in annexed Crimea and the border region of Voronezh. Janes reported that Russia's army-level communication system at a training ground south of Voronezh is not used at battalion or brigade levels and "is indicative of the scale of the deployment."

Both Janes and the CIT noted that they did not yet see signs of Russian forces being in an offensive posture. Janes said its assessment was subject to change, citing Russian army air defense systems moving into the Voronezh region "which have not been observed with prior movements." It added that announced plans to reinforce the Russian Navy Black Sea Fleet with 10 landing and artillery vessels from the Caspian Flotilla "is not a common occurrence."

Source: <https://www.themoscowtimes.com/2021/04/09/russia-moves-ground-troops-ballistic-missile-systems-near-ukraine-border-british-analysts-a73537>, 09 April 2021.

Russia Conducts First Pacific Long-Range Cruise Missile Test

Russia uses the nuclear-capable, high-precision Iskander system primarily to attack troops and hardware in a frontline fight. The missiles can be guided by troops sighting targets, by satellites or by unmanned aerial vehicles at a range of up to 500 kilometers.

The Russian Navy has for the first time fired long-range Kalibr cruise missiles on a ground target in the Sea of Japan, the Russian military announced on 06 April. The Pacific Fleet's statement follows concerns voiced by U.S. defense officials that the Kalibr, which will for the

first time allow Russian warships to conduct long-range strikes against land targets, would offset U.S. advantages in the Pacific region. "Today, the Pacific Fleet frigate Marshal Shaposhnikov for the first time launched the Kalibr cruise missile on a ground target from the waters of the Sea of Japan," the Russian military said.

The cruise missile hit its coastal target at a range of more than 1,000 kilometers, it added in an announcement on the Defense Ministry's website. The head of the U.S. Indo-Pacific Command, Adm.

Phil Davidson, testified to Congress last month that Russia will begin fielding Kalibr cruise missiles across its Pacific Fleet in 2021.

According to his reported written testimony, the missiles will give the Russian military "substantially increased anti-ship capabilities and the ability to conduct long-range strikes against land targets for the first time." Davidson added that Russia is upgrading its Pacific forces with advanced

fighters and longer-range bombers, as well as air defense and land-based anti-ship cruise missiles. "These improvements are designed to restrict access to regions of the Pacific Ocean near Russia's coast, while simultaneously expanding Russia's ability to project power across the region and into the Arctic," he was quoted as saying.

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Russia has previously fired Kalibr cruise missiles from Mediterranean Sea-based vessels at militant targets in Syria to support regime army offensives. President Vladimir Putin said in 2018 that Russian warships armed with Kalibr missiles would be on permanent standby in the region to counter the terrorist threat in Syria.

Source: *The Moscow Times*, <https://www.themoscowtimes.com/2021/04/06/russia-conducts-first-pacific-long-range-cruise-missile-test-a73488>, 06 April 2021.

USA–RUSSIA

Rejoining Open Skies would Send ‘Wrong Message’ to Russia, State Tells Partners

The United States appears unlikely to rejoin the 34-nation Open Skies Treaty over its concerns about Russian noncompliance, with the Biden administration telling international partners in a recent diplomatic memo obtained by Defense News that doing so would send the “wrong message” to Russia.

The note, sent days before the U.S. Air Force confirmed plans to retire the aging aircraft used to fulfill the mutual surveillance pact, may signal the end of hopes that the U.S. will rejoin the agreement. Though President Joe Biden, as president-elect, condemned then-President Donald Trump’s decision last year to withdraw from the treaty, Russia has since pulled out, and the Senate’s 50-50 split presents an uphill fight to re-ratify the agreement.

The State Department said in a statement that a final decision has not been made. However, in a March 31 demarche, it told multiple partners that the administration is “frankly

concerned that agreeing to rejoin a treaty that Russia continues to violate would send the wrong message to Russia and undermine our position on the broader arms control agenda.”

Other countries signed onto the Open Skies Treaty, including prominent NATO allies, pushed for the U.S. to remain as a participant, arguing the pact serves as a valuable channel for transparency and dialogue between Russia and the United States, the world’s top two nuclear powers. The letter acknowledged the issue came

up at a Feb. 25 NATO event, as well as in private conversations.

“While we recognize that Russia’s Open Skies violations are not of the same magnitude as its material breach of the INF Treaty, they are part of a pattern of Russian disregard for international commitments — in arms

control and beyond — that raises questions about Russia’s readiness to participate cooperatively in a confidence-building regime,” the demarche read, referring to the Intermediate-Range Nuclear Forces Treaty.

The Biden administration did not spell out its noncompliance concerns in the letter, but the Trump administration quarreled with Moscow over what cameras were being equipped on Russian overflights; it also accused Russia of restricting flights over Kaliningrad and using Open Skies to surveil the Trump golf resort in Bedminster, New Jersey, something open-source experts have questioned.

The diplomatic message doesn’t entirely rule out a return, saying: “We believe, however, that

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there are circumstances in which we return to OST or include some of OST's confidence-building measures under other cooperative security efforts." Still, it's a sharp turn from November, when Biden condemned the withdrawal, warning it would "exacerbate growing tensions between the West and Russia, and increase the risks of miscalculation and conflict." (Biden has signaled a harder line with Russia than Trump, agreeing with a news anchor's question last month that Russian President Vladimir Putin is a "killer.")

Asked about the diplomatic note, a State Department spokesman said that "no decision has been made on the future of U.S. participation in the Open Skies Treaty." "The United States is actively reviewing matters related to the treaty and consulting with our allies and partners. Russia's continuing noncompliance with the Treaty is one of several pertinent factors," the spokesman said. "As this process continues, we encourage Russia to take steps to come back into compliance with the agreement."

While the demarche likely did nothing to convince OST members that the U.S. will rejoin the agreement, two of the treaty's staunchest allies in Congress see the retirement of the aircraft used to fly Open Skies missions as a sure sign that Biden isn't rejoining. Treaty advocates were hopeful in November — when the Trump administration declared it was exiting Open Skies but didn't retire the aircraft — that the Biden team could still revive the pact.

But just days after the March 31 note to allies, the Omaha World-Herald broke news that the two 1960s-era OC-135B aircraft used to fly aerial photography missions under the treaty will be retired from the 55th Wing at Offutt Air Force Base, Nebraska, and flown to the Air Force's desert "boneyard" in Arizona in May and June.

"Since there is no longer a mission requirement

for OC-135B, the Department of the Air Force has moved to initiate standard equipment disposition actions in accordance with regulations," an Air Force spokesperson said in a statement to Defense News. "Part of that disposition includes moving the aircraft to the 309th Aerospace Maintenance and Regeneration Group at Davis Monthan Air Force Base, Arizona, in the next couple of months."

Republican Rep. Don Bacon, a retired Air Force one-star general who commanded the 55th Wing at Offutt and now represents an adjacent area, said he learned of the move from a congressionally mandated report from acting Air Force Secretary John Roth. Afterward, Bacon seemed resigned that the fight to save the OC-135Bs is lost. "I think the door's about 95 percent shut" on the Open Skies Treaty, Bacon told Defense News. "My impression from reading this document is that the Biden administration has

made the decision not to revive Open Skies. They didn't use those exact words, but they treated it matter-of-factly that it's done."

Bacon did not rule out a future push to acquire Gulfstream aircraft to fulfill the mission. However, the 20-page report said the Air Force determined it would be too costly to keep flying the OC-135Bs and that there is no other mission for them; they will be used for parts.

Another key advocate for Offutt, Sen. Deb Fischer, R-Neb., indicated to Defense News that she is ready to move on. "Russia's failure to obey the parameters of the Open Skies Treaty was the key reason why the U.S. withdrew, a decision that the Biden administration has not disputed," Fischer said in a statement. "Rather than invest more in two aircraft that were already slated for retirement, I am focused on the positive future of Offutt's growing missions."

Source: Joe Gould and Aaron Mehta, Defence

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News, https://www.defensenews.com/breaking-news/2021/04/07/rejoining-open-skies-would-send-wrong-message-to-russia-says-us-state-department/?mkt_tok=MDk1LVBQVi04MTMAAAF8Ui6fEzjb3cvOSUPWYPB0KOb6n6Q8m-uMr3J2A9e6vof32M6PHPH4ZPt2hDzk95K4JHy2hysvigEwRPE59rK2Pqd7k-NBdvsF30QiCyZDnoM7Gg, 08 April 2021.

USA

First Flight Test for US Air Force's Hypersonic Booster didn't Go as Planned

The first rocket booster test of the U.S. Air Force's hypersonic AGM-183A Air-launched Rapid Response Weapon failed when the vehicle did not launch during an April 5 flight. During tests over Point Mugu Sea Range off the coast of California, a B-52 Stratofortress bomber attempted to launch the ARRW booster vehicle. However, "the test missile was not able to complete its launch sequence" and the bomber returned to Edwards Air Force Base, California, with the test vehicle, the Air Force said in a statement.

The service plans to study the missile to understand why it didn't launch, then make alterations and attempt to fire it in a future test, the service said. "The ARRW program has been pushing boundaries since its inception and taking calculated risks to move this important capability forward," said Brig. Gen. Heath Collins, the Air Force's program executive officer for its armaments directorate. "While not launching was disappointing, the recent test provided invaluable information to learn from and continue ahead. This is why we test."

Aside from demonstrating the safe separation of the ARRW booster from the B-52 during the April 5 test, the Air Force had intended to evaluate the performance of the missile at operational speeds through ignition and the boost phase, as well as simulate the separation of the booster from the glide vehicle.

The test was carried out by the 419th Flight Test Squadron and the Global Power Bomber Combined Test Force at Edwards AFB. The ARRW test missile was delivered to the base on March 1, the service said in a March 5 release, and the first booster test flight was due to follow aboard a B-52 bomber "in the next 30 days."

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"The BTF-1 test vehicle is complete and is progressing through ground testing to verify its readiness for flight. The team has successfully dealt with COVID challenges and resolved technical findings not uncommon in a first-of-a-kind weapon system. We have minimized schedule delays while maintaining a laser focus on engineering rigor," Collins said then, according to the news release.

The service plans to conduct additional booster and all-up-round test flights throughout 2021. The ARRW program previously flew seven captive carriage flight tests, where the weapon is carried by an aircraft but not released, allowing for the service to collect data on how the weapon impacts the flight profile of the aircraft.

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The Air Force awarded Lockheed Martin a contract worth up to \$480 million for ARRW development activities in 2018, including the critical design review, testing and production readiness support. In fiscal 2021, Congress allotted \$386 million to the Air Force for hypersonic prototyping — an

increase of \$5 million over the service's budget request. But that funding came with sacrifices. Last year, the Air Force announced that it would cancel a separate hypersonic weapons program, the Hypersonic Conventional Strike Weapon also produced by Lockheed, due to budget constraints that forced the service to downselect to a single effort.

Although the HCSW program had shown promise, ARRW had a more "unique glide body design" when compared to HCSW or some of the other hypersonic weapons under development by the Navy and Army, a service spokeswoman said at the time. Both ARRW and HCSW are boost glide hypersonic weapons, which fly just below space, but the service is also interested in hypersonic cruise missiles that would be able to take a flight path with lower trajectories.

Source: Valerie Insinna, Defence News, https://www.defensenews.com/air/2021/04/06/the-first-flight-test-of-the-air-forces-air-launched-hypersonic-booster-didnt-go-as-planned/?mkt_tok=MDk1LVBQVi04MTMAAAF8R9sjqt1k0fccsRTVA1_7QeRG0ANRIaE9Ngne6gvbkkID-vmMNOyNP4OoZcYoNwQhASxF19dPNlIdu8c0fmTUKheQl-aILEk3YEwnVuLPh78FA, 07 April 2021.

NUCLEAR ENERGY

ESTONIA

Estonia to Assess Adoption of Nuclear Energy

The Estonian government formally approved the formation of a nuclear energy working group (NEPIO) tasked with analysing the possibility of introducing nuclear energy in Estonia. Headed by Environment Minister Tõnis Mölder, the NEPIO will present its conclusions and proposals to the government by September 2022 at the latest.

"In order to increase Estonia's energy security, sustainability and competitiveness and achieve the 2050 climate targets, the introduction of nuclear energy would be one of the possible solutions," Mölder said. "Nuclear energy would be able to provide 24/7 electricity, independently of weather conditions, while the process of deploying it would be very long lasting and would require huge

investment from the state. The difficult question of what to do with spent nuclear fuel should also be resolved," he added.

The NEPIO will need to analyse technologies and actual projects under development in other countries, and assess whether the development of a nuclear power plant should be carried out by the state or the private sector and what the possibilities for private-public cooperation could be. In addition, the know-how and labour needs for the development of nuclear energy need to be worked out, Mölder said.

Estonia could consider, in particular, the deployment of Generation IV small modular reactors that are expected to be easier to build than a large nuclear power plant, which would not in any case be operational until 2035, he said, adding that "nothing has been decided yet". The country's introduction of nuclear energy requires public support and must provide "clear answers to people's legitimate questions and fears", he said. "A science-based approach alone is not enough, and the general preparedness of people and society is also needed," he added.

The NEPIO includes representatives of the Ministry of the Environment, the Environment Agency, the Ministry of The Interior, the Ministry of Finance, the Ministry of Justice, the Ministry of Education and Research, the Ministry of Economic Affairs and Communications, the Ministry of Defence, the Ministry of Foreign Affairs, the Ministry of Social Affairs and the State Chancellery. ...

Fermi Energia, which was founded by Estonian energy and nuclear energy professionals to develop deployment of SMRs in Estonia, welcomed the establishment of the NEPIO. ...The NEPIO's primary task, he said, is to assess the possibility of adopting nuclear energy, including the use of small modular reactors, to help the Baltic country to achieve climate neutrality and security of supply. ...

Source: World Nuclear News, <https://www.world-nuclear-news.org/Articles/Estonia-appoints-working-group-to-assess-adoption>, 09 April 2021.

UAE

UAE's First Nuclear Power Plant Begins Commercial Operations

The United Arab Emirates' first nuclear power plant started commercial operations 06 April, the Gulf Arab state's leaders announced on Twitter. The Barakah nuclear power plant in the Abu Dhabi emirate is the first nuclear power station in the Arab world and part of the oil producing state's efforts to diversify its energy mix. ...

De facto ruler Abu Dhabi Crown Prince Mohammed bin Zayed al-Nahyan said it was a historic milestone for the country, which this year celebrates 50 years since its formation. Barakah's construction has faced delays as the Gulf state builds a nuclear industry from scratch.

Unit 1 received its operating licence from the nuclear regulator in 2020, three years after its expected planned start up in 2017. Last August, Unit 1 was connected to the national power grid and in December reached 100% of reactor power capacity during testing. Unit 2 was issued an operating licence in March this year. When completed Barakah, which is being built by KEPCO, will have four reactors with 5,600 MW of total capacity - equivalent to around 25% of the UAE's peak demand.

Source: Reuters Staff, Reuters, https://www.reuters.com/article/us-emirates-nuclearpower/uaes-first-nuclear-power-plant-begins-commercial-operations-idUSKBN2BT16E?il=0&mkt_tok=M Dk1LVBQVi04MTMA AAF8R9sjJhji079k24 5XLcBbYkpg 19HLbsa6dv6Ru XTtop6IXUQWaEM

afq7RQ2KjAGdJKR5WcL9GGTdKO_YS7 dKcR_PBlvgJAojKcGdXlrX5Q_TBtg, 06 April 2021.

USA

Blue Origin Wins Contract to Design Nuclear-Powered Spacecraft

Jeff Bezos' Blue Origin company is working on a new spacecraft project that'll fly via nuclear thermal propulsion. Blue Origin was among three companies awarded with US government contracts to design the concept nuclear-powered spacecraft. The

project comes from DARPA within the US Defense Department, which is best known for funding experimental prototypes, including a predecessor to the internet. In this case, the goal is to create a nuclear thermal propulsion system that can fly in low Earth orbit by 2025.

Current spacecraft, including Blue Origin's, rely on burning chemical fuel to travel in space. But for decades, scientists also considered powering spaceships with nuclear reactions. The main advantages include better fuel efficiency and performance over chemical combustion. The nuclear reaction would be used to heat up a liquid propellant for thrust.

DARPA also says a nuclear thermal propulsion system could achieve a "high

thrust-to-weight ratio," enabling the spacecraft to rapidly maneuver in orbit. "The NTP technology we seek to develop and demonstrate under the DRACO program aims to be foundational to future operations in space," added Major Nathan Greiner, a DARPA manager for the project.

The government agency has tasked Blue Origin and aerospace company Lockheed Martin with

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independently developing a concept spacecraft design around the nuclear thermal propulsion system. A third company, General Atomics, will focus on developing the propulsion system itself. ... DARPA says the first phase of the project will occur over 18 months and involve creating preliminary designs. The project then aims to transition to more detailed designs, fabrication, and then an actual demonstration to reach the 2025 goal.

Source: Michael Kan, <https://in.pcmag.com/news/142011/blue-origin-wins-contract-to-design-nuclear-powered-spacecraft>, 14 April 2021.

USA Preparing to Lead Advanced Nuclear Fuel Supply, Says Korsnick

Noting that, last year, nuclear became the USA's second biggest source of electricity, surpassing coal for the first time ever, and that the US nuclear fleet produced more carbon-free electricity than all of the forms of renewable energy combined, Korsnick said nuclear is increasingly being recognised by lawmakers as a carbon-free and scalable source of electricity.

"Ambitious climate commitments really demand a reimagined energy system with our largest, most reliable carbon-free source at its centre," she said. "And already the Biden Administration has signaled that they agree. The President recently announced its USD2 trillion American Jobs Plan and this legislation would establish a national clean energy standard that includes nuclear; recognising its carbon-free production alongside sources like wind and solar. The plan would also include significant funding for the development of advanced nuclear technology."

Jennifer Granholm, the new secretary of energy, has "spoken about her commitments to all emission-free technologies, including nuclear", Korsnick said, and John Kerry, the special presidential envoy for climate, "has stated his strong support for US nuclear exports". "So we're

really building an unparalleled coalition for making nuclear energy the core of our clean energy system, but it will take a global effort to realise nuclear's full potential," she said.

The future of nuclear includes advanced reactor technologies, which "also causes us to have a look at US leadership more broadly", she said. "With advanced reactors you have to say, What fuel are they going to run on? Many of these advanced reactors are going to require high assay and low-enriched uranium (HALEU). The US government has recognised the timing challenge for commercial entities to build out HALEU capacity without yet a clear market signal and so it's taking concrete steps for the US to lead in this area," she said.

Last year Congress passed legislation that instructed the US DOE to establish a HALEU programme, and by this time next year, Centrus will be producing HALEU in their pilot facility, she said.

"So we really see the DOE providing a function as a market pool to try to get things started here in the United States to drive commercial entities here, whether that's Centrus or Urenco or Global Laser Enrichment, to give those signals to build out that HALEU capacity." ...

Source: <https://world-nuclear-news.org/Articles/USA-preparing-to-lead-advanced-nuclear-fuel-supply>, 13 April 2021.

NUCLEAR COOPERATION

INDIA-RUSSIA

Discussed Nuclear, Defence Cooperation: Jaishankar On Talks with Russian Counterpart

External affairs minister S Jaishankar met his Russian counterpart Sergey Lavrov on 06 April. The talks focussed on various aspects of bilateral ties including defence and nuclear cooperation. The leaders also discussed the upcoming India-Russia annual summit. Discussions were "comprehensive and productive", Jaishankar said after the meeting concluded.

The future of nuclear includes advanced reactor technologies, which "also causes us to have a look at US leadership more broadly", she said. "With advanced reactors you have to say, What fuel are they going to run on? Many of these advanced reactors are going to require high assay and low-enriched uranium (HALEU).

"We talked about our long-standing partnership in nuclear, space and defence sectors. We also discussed our rapidly expanding energy cooperation and exchanged views on regional, global matters," Jaishankar said. The duo also held talks on the countries' approach to Afghanistan, the minister said, adding, "I shared our viewpoint on the Indo-Pacific."

Meanwhile, Lavrov said Russia was satisfied with the outcome of the talks adding that they also discussed aspects related to defence cooperation and weapons manufacturing.

The Ministers also discussed the proposed free trade pact between India and the Eurasian Economic Union. People familiar with the discussions said the Indian side apprised the Russian delegation of its views and apprehensions over China's behaviour in the backdrop of the border row in eastern Ladakh.

At a press conference with Lavrov, Jaishankar, terming the talks "very warm" and "very productive", said much of the discussions covered the preparations for President Vladimir Putin's visit to India for the annual India-Russia summit later this year. To a question, Lavrov dismissed the possibility of any future military alliance between Russia and China and asserted the cooperation between the two countries was not directed against anyone.

Referring to bilateral defence ties, Lavrov said Russia was ready for transfer of cutting edge technologies and "additional manufacturing" of weapons systems in India. Russia is already part of several joint production of military hardware

projects in India. "I am sure deepening of military cooperation serves national interests of both the countries. At the same time, we respect the right of Indian friends to diversify ties in this area," he said and described the outcome of the talks as "satisfactory".

We talked about our long-standing partnership in nuclear, space and defence sectors. We also discussed our rapidly expanding energy cooperation and exchanged views on regional, global matters," Jaishankar said. The duo also held talks on the countries' approach to Afghanistan, the minister said, adding, "I shared our viewpoint on the Indo-Pacific.

Without elaborating, Jaishankar said, "Our defence sector requirements in the past year were expeditiously addressed." Asked whether the issue of the US putting pressure on India to not procure Russian weapons systems figured in the talks, he said it did not. He

said the US puts pressure on India and any other country that wants to sign agreement with Russia for procuring weapons. The Russian foreign minister arrived here on a nearly 19-hour visit amid apparent unease in Moscow over the proactive approach of the Quad member nations, including India, in dealing with geo-political developments in the Indo-Pacific region.

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Lavrov is travelling to Islamabad from India. Jaishankar said both nations understand the importance of the India-Russia relationship to global peace, security and stability and that the review of bilateral ties was "really encouraging". "I shared our viewpoint on Indo-Pacific. As our prime minister pointed out at the Shangri-La Dialogue some years ago, contemporary

challenges require countries to work together in new and different ways," Jaishankar said.

Russia has been critical of the Quad grouping that has been aimed at ensuring a free and open Indo-Pacific against the backdrop of China's growing assertiveness in the region. Quad comprises India,

the US, Japan and Australia. Lavrov referred to Indo-Pacific as Asia-Pacific and said both sides highlighted the need to preserve the central role of ASEAN in the region. He also highlighted the need for interaction among Russia, India and China under the existing trilateral framework.

At the press conference, Lavrov dismissed suggestions of any future military alliance between Russia and China. "We have heard speculation about pro-military alliances not only with respect to Russia and China relations, we have also heard about such alliances allegedly being promoted such as Middle East-NATO, Asia-NATO. Today we exchanged views on this and our Indian friends have the same position as we. We believe this is counter-productive," he said in Russian.

"We are interested in inclusive cooperation that is for something, not against somebody," Lavrov said. Jaishankar said developments in and around Afghanistan also figured in the talks. "For India, what happens in Afghanistan impacts its security directly. I shared our approach that a durable peace there would require harmonising interests of all, both within and around that nation." "The peace process must be based on foundational principles to which we all subscribe. A political solution should mean an independent, sovereign, united and democratic Afghanistan," he said.

The Russian foreign ministry termed the talks "an open-minded exchange of views on most significant issues of the international and regional agenda". It said both sides stated the similarity of approaches to pressing global and regional problems, including a peaceful settlement in

Afghanistan, the Syrian crisis, the situation around Iranian nuclear programme, as well as a common understanding of the principles of shaping a reliable security architecture in the Pacific and Indian Oceans.

Jaishankar said discussions were also held on trade and investment. "We note the appetite for greater investments in each other by both countries. Russian support for our Gaganyaan programme has progressed which we deeply

appreciate," he said, adding the longstanding partnership in nuclear and space sectors figured in the talks. "Our rapidly expanding energy cooperation that now includes long-term commitments was also on the agenda."

Lavrov said both sides agreed on the need to galvanise work on renewed intergovernmental agreement on mutual security of investments and settlement of issues relating to national currencies. "We have to launch as soon as possible talks on free trade pact between India and the Eurasian Economic Union based on mutual benefit," he said.

Source: Outlook, <https://www.outlookindia.com/website/story/india-news-discussed-nuclear-defence-cooperation-jaishankar-on-talks-with-russian-counterpart/379447>, 06 April 2021.

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NUCLEAR PROLIFERATION

IRAN

Iran Vows to Ramp Up Uranium Enrichment After Nuclear Site Incident

Iran warned on 13 April it will start enriching uranium up to 60 percent purity, two days after an explosion it blamed on arch-enemy Israel hit its

key nuclear facility in Natanz. The announcement cast a shadow over ongoing talks in Vienna aimed at salvaging the tattered 2015 nuclear deal between Iran and world powers that former US president Donald Trump abandoned three years ago.

Tehran has written to the UN's IAEA to announce "that Iran will start 60 percent enrichment," the official IRNA news agency reported. The move will bring Iran closer to the 90 percent purity threshold for military use and shorten its

potential "breakout time" to build an atomic bomb, a goal it denies. Under the nuclear deal, Iran had committed to keep enrichment to 3.67 percent, though it had stepped this up to 20 percent in January.

The latest news came two days after an explosion knocked out power at Iran's main nuclear facility of Natanz in central Iran which the Islamic republic blamed on Israel and labelled an act of "terrorism". Israel, which did not claim responsibility, is strongly opposed to US President Joe Biden's efforts to revive the nuclear agreement.

The accord between Iran and the UN Security Council's permanent members plus Germany promised Iran relief from punishing sanctions in return for agreeing to limits on its nuclear programme. Israel has vowed it will stop the Islamic republic from ever building an atomic bomb, which it considers an existential threat to the Jewish state.

"Bad Gamble": The mysterious blast at Natanz has sharply heightened tensions between the two powers already engaged in a shadow war on lands and seas across the Middle East, with Iran vowing to take "revenge". "If (Israel) thought that they

can stop Iran from following up on lifting sanctions from the Iranian people, then they made a very bad gamble," Iranian Foreign Minister Mohammad Javad Zarif warned. Iran would make the enrichment plant "more powerful" by using advanced centrifuges, he added.

IRNA reported that Iran would also add "1,000 centrifuges with 50 percent more capacity to the machines present in Natanz, in addition to replacing" those damaged in the attack. According to

Iran's English-language channel Press TV, the enrichment jump will start on Wednesday (14 April).

Zarif, after talks with his visiting Russian counterpart Sergei Lavrov, also warned Israel's ally the United States it would gain no extra leverage

in Vienna through "acts of sabotage" and sanctions. The White House has denied all US involvement in the Natanz incident.

Unsources Israeli media reports attributed the blast to Israeli security services. *The New York Times*, quoting unnamed US and Israeli intelligence officials, also said there had been "an Israeli role" in the

attack in which an explosion had "completely destroyed" the power system that fed the plant's "underground centrifuges". Quoting another unnamed intelligence source, the NYT added that an "explosive device had been smuggled" into the site and "detonated remotely", taking out primary and backup power.

"Worse than a Crime": Lavrov, during his Tehran visit, stressed Russian support for Iran's position. "We are counting on the fact that we will be able to save the agreement and that Washington will finally return to full and complete implementation

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The mysterious blast at Natanz has sharply heightened tensions between the two powers already engaged in a shadow war on lands and seas across the Middle East, with Iran vowing to take "revenge". "If (Israel) thought that they can stop Iran from following up on lifting sanctions from the Iranian people, then they made a very bad gamble," Iranian Foreign Minister Mohammad Javad Zarif warned.

of the corresponding UN resolution," Lavrov said. Europe's "inability to implement" its nuclear deal commitments and "bowing to America's pressure" shows it is "slowly losing its relevance in international relations", Zarif said.

He also blasted the European Union for slapping sanctions on eight Iranian security officials, in response to a crackdown on 2019 street protests, saying the blacklisting threatens efforts to restore the deal. "If this decision was taken voluntarily in the midst of negotiations in Vienna... it is a mistake worse than a crime," said Lavrov. "I hope our European colleagues understand that such actions are unacceptable and will take measures not to allow the talks to be derailed."

Lavrov's remarks come at a time of heightened tensions between Russia and the West over various issues, also including Ukraine. Iranian President Hassan Rouhani meanwhile told Lavrov that Iran expects a "return to 2015's agreements and obligations". For now, the agreement remains in limbo with neither Tehran nor Washington backing down from their positions, and each demanding the other make the first move.

Source: <https://www.ndtv.com/world-news/iran-vows-to-ramp-up-uranium-enrichment-after-nuclear-site-incident-2412949>, 13 April 2021.

Iran Testing Advanced Nuclear Centrifuge that would Allow Faster Uranium Enrichment

Iran said it has begun mechanical tests on its newest advanced nuclear centrifuge, even as the five world powers that remain in a foundering

2015 nuclear deal with Iran attempt to bring the U.S. back into the agreement. Iran's IR-9 centrifuge, when operational, would have the ability to separate uranium isotopes more quickly than the current centrifuges being used, thereby enriching uranium at a faster pace. The announcement carried on state TV came on Iran's 15th annual "Nuclear Day."

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The IR-92's output is 50 times quicker than the first Iranian centrifuge, the IR-1. The country also announced it had launched a chain of 164 IR-6 centrifuges on Saturday (10 April), and is also developing IR-8 centrifuges. Since January, Iran has begun enriching uranium at up to 20% purity, a technical step away from weapons-grade levels, though Iran's leadership insists the country has no desire to develop a nuclear weapon. Former U.S. President Donald Trump pulled the U.S. out of the nuclear accord in 2018, accusing Iran of failing to live up to the agreement, opting for what he called a maximum-pressure campaign of stepped-up U.S. sanctions and other tough actions.

Iran's stockpile of 20% enriched uranium has reached 55 kilograms (121 pounds), moving its nuclear program closer to weapons-grade enrichment levels. The amount of the material was 17 kilograms in January. Iran has installed 1,000 IR2 centrifuge machines and one cascade of 164 IR4 machines. Both are in operation and have more speed than the IR1 machines.

Iran responded by intensifying its enrichment of uranium and building centrifuges in plain violation of the accord, while insisting that its nuclear development is for civilian not military purposes. Israel maintains Iran still maintains the ambition of developing nuclear weapons, pointing to Tehran's ballistic missile program and research into other technologies.

Iran denies it is pursuing nuclear weapons, and says its nuclear program is for peaceful purposes. Iran's stockpile of 20% enriched uranium has reached 55 kilograms (121 pounds), moving its nuclear program closer to weapons-grade enrichment levels. The amount of the material

was 17 kilograms in January. Iran has installed 1,000 IR2 centrifuge machines and one cascade of 164 IR4 machines. Both are in operation and have more speed than the IR1 machines.

Since late February, Iran has ceased abiding by a confidential agreement with the U.N.'s nuclear watchdog reached as part of the landmark 2015 nuclear deal. The International Atomic Energy Agency has additional protocols with several countries it monitors. Under the protocol with Iran, the IAEA "collects and analyzes hundreds of thousands of images captured daily by its sophisticated surveillance cameras," the agency said in 2017. The agency also said then that it had placed "2,000 tamper-proof seals on nuclear material and equipment."

However, Iran's parliament passed a bill in December requiring the government to limit its cooperation with the IAEA and push its nuclear program beyond the limits of the 2015 nuclear deal. After the bill became law, Iran then began enriching uranium up to 20% purity and spinning advanced centrifuges — both barred by the deal.

Iran argues that the U.S.'s departure from the nuclear deal was the first violation of the deal by either country and therefore the U.S. must make the first move and remove sanctions before Iran returns to compliance.

President Joe Biden came into office saying that getting back into the accord and getting Iran's nuclear program back under international restrictions was a priority. But Iran and the United States have disagreed over Iran's demands that sanctions be lifted first. That deadlock has threatened to become an early foreign policy

setback for the new U.S. president. Talks in Vienna aimed at bringing the U.S. back into the deal with Iran broke Friday (09 April) without any immediate signs of progress on issues dividing Washington and Tehran. However, delegates spoke of a constructive atmosphere and resolved to continue the discussions.

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Source: CNBC, <https://www.cnbc.com/2021/04/10/iran-testing-advanced-nuclear-centrifuge-that-would-allow-faster-uranium-enrichment.html>, 10 April 2021.

Iran Launches Advanced Uranium Enriching Machines to Mark Nuclear Day

President Hassan Rouhani reiterated Iran's commitment to nuclear non-proliferation on Saturday (10 April) while overseeing the launch of advanced centrifuges at the underground Natanz nuclear plant to mark National Nuclear Technology Day. Iran has breached many restrictions imposed by a 2015 deal on its atomic activities in response to former president Donald Trump's withdrawal from the deal in 2018. The

two nations have laid out tough stances at indirect talks in Vienna on how to bring both back into full compliance with the accord.

A live video link carried on state TV showed Rouhani ordering the injection of uranium gas into 164 IR-6

A live video link carried on state TV showed Rouhani ordering the injection of uranium gas into 164 IR-6 centrifuges, 30 IR-5 centrifuges, and mechanical tests on IR-9 machines with the capacity of 50 early IR-1 machines - a likely new breach of the nuclear deal.

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The ceremony unveiled 133 advances over the past year in the country's nuclear industry mostly in the fields of medicine, power, agricultural and energy, state television said. "Once again, I stress that all our nuclear activities are peaceful and for

non-military purposes," Rouhani said in televised remarks. "We continue to be committed to our pledge to NPT and to the world not to deviate militarily from our nuclear programme," Rouhani said.

The talks in Vienna, in which European Union officials are shuttling between the remaining parties to the deal and the United States, aim to restore the bargain at the core of the agreement - restrictions on Iran's nuclear activities in exchange for the lifting of U.S. and other international sanctions. ...

Source: Reuters, <https://www.reuters.com/article/us-iran-nuclear/iran-launches-advanced-uranium-enriching-machines-to-mark-nuclear-day-idUSKBN2BX09K>, 10 April 2021.

As Vienna Talks End, Zarif Stresses Iran's 'Logical Path' to Saving JCPOA

As the latest round of talks on the 2015 nuclear deal ends in Vienna, Foreign Minister Mohammad Javad Zarif says Iran has offered a "logical path" towards the revival of the agreement, through which the US would remove the sanctions imposed by its ex-administration on Iran in their entirety — without any distinction — before Tehran does its part.

Zarif made the remarks in a tweet he posted on Friday (09 April), shortly after delegates of Iran and the co-signatories to the nuclear deal — Russia, China, France, Britain and Germany — wrapped up four days of talks and diplomatic efforts in the Austrian capital to revitalize the agreement, formally named the JCPOA.

The JCPOA has been in crisis since May 2018, when the US under ex-president Donald Trump pulled his country of the agreement and re-imposed the sanctions that had been lifted under the UN-endorsed document. Besides, the hawkish Trump administration launched a campaign of "maximum pressure" on Iran, under which it placed on Iran several other sets of sanctions under pretexts

unrelated to the nuclear issue. A year later, Iran began to take a series of progressive retaliatory measures as part of its contractual rights under Article 36 of the JCPOA.

In his tweet, Zarif said "Iran proposes logical path to full JCPOA compliance," explaining that the "US — which caused this crisis — should return to full compliance first," and then Iran will follow suit and "reciprocate following rapid verification." Critical of Trump's Iran policy, the new US administration says it wants to rejoin the JCPOA, but has so far refused to compensate for the former president's mistake and remove his anti-Iran sanctions, as required by Tehran.

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Iran has invariably asserted that the United States must first remove all the Trump-era sanctions if it seriously seeks to return to the JCPOA. Reaffirming that official position, Zarif added that "all Trump sanctions were anti-JCPOA & must be removed—w/o distinction between arbitrary designations,

seriously seeks to return to the JCPOA. Reaffirming that official position, Zarif added that "all Trump sanctions were anti-JCPOA & must be removed—w/o distinction between arbitrary designations," referring to the restrictions imposed by the US on Iran under

pretexts labeled "non-nuclear."

Following the discussions in Vienna, Iran's top negotiator, Abbas Araqchi, described the talks as "constructive." He added that Tehran stands ready for "serious interactions" with the co-signatories, but this will depend on the seriousness and political will of the other parties. "Otherwise, there will be no reason for the negotiations to continue," warned Araqchi, who serves as the deputy foreign minister for political affairs.

He said the termination of "all the American sanctions devised under Trump is the necessary step for the revival of the JCPOA. Only after verification [of the sanctions removal], Iran will be ready to stop its remedial measures and return to full compliance." The talks started in Vienna on 06 April within the format of the JCPOA Joint Commission. A US delegation had also traveled to the Austrian capital, but it did not have Iran's permission to attend the discussions.

During that session, Iran and the other JCPOA partners agreed to form two expert-level working groups, one of which was tasked with working on the possible removal of the American sanctions. The other was also assigned to take care of the nuclear issues and their implementation.

The two groups started their job swiftly and briefed the JCPOA signatories on their conclusions three days later on Friday (09 April). JCPOA Commission to reconvene on Wed. Following the briefing session, the participants agreed to hold another round of talks in the Austrian city.

It was also agreed that the next JCPOA Joint Commission will be held at the deputy-level on the first day, following which the expert groups will continue intensive technical negotiations on drawing up a list of the measures that the concerned parties should take regarding the sanctions removal and the nuclear implementation of the deal.

The Foreign Ministry said in a statement that the Iranian delegation held constant bilateral and multilateral consultations with the other five co-signatories as well as Enrique Mora, the Joint Commission's coordinator, over the past four days.

The United States was not present in any of the sessions, the statement added. Speaking to Press TV, Araqchi said that Iran and its partners in the deal are moving "in the direct direction, and we have to continue." He said the progress of the two working group was "fairly good," but still their discussions need to go on, especially in the field of the sanctions lifting, which he described as "so complicated."

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It was also agreed that the next JCPOA Joint Commission will be held at the deputy-level on the first day, following which the expert groups will continue intensive technical negotiations on drawing up a list of the measures that the concerned parties should take regarding the sanctions removal and the nuclear implementation of the deal.

Asked about Iran's assertion that the US must remove the sanctions before Tehran takes action, the official said Tehran's stance was "reasonable, and that is a "concept that almost everybody agreed on," since it was Washington that first left the negotiating table. "We need to somehow identify how this is going to happen. But before we come to that

point, now we are working on the measures that both sides should take. Once we [are] done with this and once we know exactly what the US should do and Iran should do, then we have to work on the question of sequence and verification," he said.

Araqchi also answered a question about the type of the sanctions removal that is under discussion. "We know we have to go back to the same JCPOA model. There are sanctions which should be terminated, and the US president has the authority to terminate them...and there are sanctions which are actually the result of the Congress legislation," said the official, adding that the second category of the sanctions could only be waived by the

American president. "We want all those sanctions [to be] reversed. Whatever imposed during the Trump administration, whatever imposed, re-imposed or re-labeled, and whatever mentioned in the JCPOA should be reversed," he said.

By verification of the sanctions removal, he added, Iran means that it should be able to see the effects of the lifting of the restrictions in practice. "It is not enough for the US to [merely] sign waivers or executive orders...what is important to us is to see the effect of the sanctions lifting on the ground," he said, adding that the methods of such a verification are still under discussion.

Meanwhile, representatives of Russia and China to the Vienna talks said there had been progress in the diplomatic process to resolve the Iran-US dispute over the JCPOA. "The JCPOA participants took stock of the work done by experts over the last three days and noted with satisfaction the initial progress made," Mikhail Ulyanov, Russia's envoy to the IAEA, said on Twitter. "The Commission will reconvene next week in order to maintain the positive momentum," the Russian diplomat added.

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In another tweet, he said "for a long time we spoke about the need to restore the #JCPOA, but only now we have started to elaborate practical steps in this direction. If we succeed we can strengthen non-proliferation regime, alleviate suffering of the Iranian population and ease tension in Persian Gulf."

Likewise, Wang Qun, China's ambassador to the IAEA, said "the working groups and senior diplomats would intensify their discussions next week." "All parties have narrowed down their differences and we do see the momentum for gradually evolving consensus," the Chinese official added. The Chinese Foreign Ministry spokeswoman also blamed the diplomatic dispute revolving around the Iran deal on the US's withdrawal. renewing the call for Washington to lift its sanctions against the Islamic Republic. "The former US administration withdrew from the JCPOA and exerted maximum pressure on Iran. This is the root cause of the persistent tension of the Iranian nuclear situation," Hua Chunying said in a post on her twitter page. "The US should

Senior European Union diplomat Mora, who chaired the Vienna talks on behalf of EU foreign policy chief Josep Borrell, issued a statement to elaborate on the content of the negotiations and the outcome. "Participants took stock of the discussions held at various levels since the last Joint Commission in view of a possible return of the US to the JCPOA and discussed modalities to ensure the return to its full and effective implementation," it said.

return to the deal unconditionally and lift all relevant sanctions at an early date, including long-arm jurisdictions over a third party. On this basis, Iran should resume compliance reciprocally," she added.

In turn, senior European Union diplomat Mora, who chaired the Vienna talks on behalf of EU foreign policy chief Josep Borrell, issued a statement to elaborate on the content of the negotiations and the outcome. "Participants took stock of the discussions held at various

levels since the last Joint Commission in view of a possible return of the US to the JCPOA and discussed modalities to ensure the return to its full and effective implementation," it said. The participants emphasized "their resolve to further pursue the ongoing joint diplomatic effort. The coordinator will continue his separate contacts with all JCPOA participants and the United States," the statement read.

Source: Press TV, <https://www.presstv.com/Detail/2021/04/09/649109/Iran-Zarif-Vienna-talks-JCPOA>, 09 April 2021.

NORTH KOREA

North Korea can Likely Arm Missiles with Nuclear Warheads: UN

North Korea has likely developed the ability to mount nuclear warheads onto its intercontinental ballistic missiles, a United Nations panel warned in a report, as the country continues to advance its

weapons program funded by cryptocurrency heists, smuggling operations and more.

"It is highly likely that a nuclear device can be mounted on the intercontinental ballistic missiles,

and it is also likely that a nuclear device can be mounted on the medium-range ballistic missiles and short-range ballistic missiles," concluded the panel, which reports to the U.N. Security Council. It said there was still uncertainty whether North Korea "had developed ballistic missiles resistant to the heat generated during reentry."

North Korea has been advancing its nuclear and missile capabilities in recent years, including on the production of highly enriched uranium. It is building a light water reactor as well as modernizing the Pyongsan uranium mine complex, according to the report. The country may be able to produce up to 7 kg of plutonium a year and could already possess a 60 kg stockpile, it said.

North Korea was also found to have worked with Iran on long-rang missile development last year. An Iranian research center received assistance from North Korean missile experts on rocket launches, and the North exported valves, electronics and measuring equipment for missile tests to Iran.

Many countries raised alarms over Pyongyang's growing weapons capabilities. The report "has revealed alarming details on North Korea's advancing nuclear and ballistic missile program. The international community must do better on sanctions implementation," the U.S. Mission to the U.N. tweeted. Norway, which chairs the U.N. sanctions committee on North Korea, is also "concerned" by Pyongyang's continued development of missiles and weapons of mass destruction, its

mission to the U.N. tweeted.

North Korea test-fired what is believed to have been two upgraded short-range ballistic missiles. Several members of the U.N. Security Council slammed the move as a clear violation of its resolutions. The body held an emergency meeting, though it did not issue a joint statement. The latest report outlined ways through which North Korea is funding weapons development. It tied BeagleBoyz, a hacker unit under North Korea's Reconnaissance General Bureau, to several cyberattacks on financial institutions and cryptocurrency exchanges that had been under investigation since 2019.

It is highly likely that a nuclear device can be mounted on the intercontinental ballistic missiles, and it is also likely that a nuclear device can be mounted on the medium-range ballistic missiles and short-range ballistic missiles," concluded the panel, which reports to the U.N. Security Council.

North Korea swaps the stolen coins for other cryptocurrencies to throw off tracking efforts in a technique called "chain-hopping."

North Korea stole \$314.6 million in virtual assets from 2019 to November 2020, the report said.

North Korea was found to be responsible for cyberattacks on dozens of defense industries worldwide, including in Israel. North Korean attackers would impersonate human resources officers at prominent defense and aerospace companies to approach employees at their targets on social media. After forming a connection through texts and phone conversations, they would send emails containing malware to their

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Ship-to-ship transfers also remain a concern. The report said North Korea exported at least 4.1 million tons of coal and possibly other minerals to China despite U.N. sanctions between January

and September of 2020, by transporting cargo between ships at sea. North Korea imported several times its 500,000-barrel annual cap for refined petroleum products, set by the Security Council in December 2017, over the same period.

Due to travel restrictions related to coronavirus pandemic, North Korean workers overseas also have remained at their posts beyond their original end dates and continue to send money back to the regime. Many of them enter foreign countries on tourist and student visas, only to work in construction or technology-related jobs.

Source: Hiona Shiraiwa and Kaori Yoshida, <https://asia.nikkei.com/Spotlight/N-Korea-at-crossroads/North-Korea-can-likely-arm-missiles-with-nuclear-warheads-UN>, 01 April 2021.

NUCLEAR SAFETY

JAPAN

Japan to Dump over 1 Million Tonnes of Fukushima Nuclear Plant Water into Sea

Japan will release over a million tonnes of water from the destroyed Fukushima nuclear station into the sea, the country's government announced on 13 April, reported AFP. The government argued that the release was safe as the water will be processed to remove almost all radioactive elements and will be diluted.

Around 1.25 million tonnes of water have accumulated in tanks at the nuclear plant, which was crippled after going into meltdown following a tsunami in 2011. It includes water used to cool the plant, as well as rain and groundwater that seeps in daily, according to AFP.

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"Releasing the treated water is an unavoidable task to decommission the Fukushima Dai-ichi Nuclear Power Plant and reconstruct the Fukushima area," Japan Prime Minister Yoshihide Suga said, according to Reuters. He said the release would happen only after ensuring the "safety levels of the water", alongside measures to "prevent reputational damage".

The first tranche of release will take place in about two years and the entire process could take decades to complete. The Tepco, plans to filter the contaminated water to remove isotopes, leaving only tritium, a radioactive isotope of hydrogen hard to separate from water. Tepco will then dilute the water until the tritium levels fall below regulatory limits, before pumping it into the ocean. However, Tritium is considered to be relatively harmless because it does not emit enough energy to penetrate human skin, according to Reuters.

Opposition: The announcement has already triggered objections from neighbouring China and local fishermen groups. "This approach is extremely irresponsible and will seriously damage international public health and safety and the vital interests of the people of neighbouring countries," the Chinese foreign ministry said in a statement on its website, according to AFP. Beijing added that the ocean was "common property of mankind" and so, the disposal of nuclear waste was not a "domestic issue" of Japan.

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Kanji Tachiya, who heads a local fisheries cooperative in Fukushima said they fear that the release will undermine years of work to restore confidence in seafood from the region. "They told

us that they wouldn't release the water into the sea without the support of fishermen," Tachiya said. "We can't back this move to break that promise and release the water into the sea unilaterally."

However the IAEA has backed the decision saying that there was "no scandal" involved in the process. "Releasing into the ocean is done elsewhere...It's not something new," IAEA Director General Rafael Mariano Grossi had said last year. The United States' state department has also said that Japan had been "transparent" about the process and the decision was taken "in accordance with globally accepted nuclear safety standards".

Source: <https://scroll.in/latest/992139/japan-to-dump-over-1-million-tonnes-of-fukushima-nuclear-plant-water-into-sea>, 13 April 2021.

Japan Regulator Bans Nuke Plant Restart over Lax Safeguards

The operator of the Fukushima nuclear plant that was destroyed in a 2011 disaster said Wednesday (7 April) it will accept a penalty imposed by regulators over sloppy anti-terrorism measures at another nuclear plant it runs, a step that will prevent its desperately sought restart of the facility for at least a year.

Tokyo Electric Power Co. made the announcement in response to a decision by the Nuclear Regulation Authority in late March to ban it from moving any nuclear materials at the No. 7 reactor at the Kashiwazaki-Kariwa nuclear power plant in Niigata prefecture. The measure will suspend all ongoing steps to restart the plant.

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The plant was partially damaged in a 2007 earthquake, causing mistrust among local municipalities. It has been offline since 2012. Of the 54 nuclear reactors Japan used to have, nine have been restarted under tougher post-Fukushima safety standards and four are currently operating..

Regulators found malfunctioning anti-terrorism equipment and inadequate protection of nuclear materials at multiple locations at the plant from at least 2018. The chairman of the authority, Toyoshi Fuketa, says TEPCO has since restored the safety functions, but the problems were deemed serious and systematic. The punishment will be officially issued at a regulatory commission meeting next week, he said.

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The authority gave the Kashiwazaki-Kariwa plant's nuclear security a "red" rating, meaning its management had deteriorated to levels that could allow intruders. It was the first time a Japanese nuclear operator was given that rating. "I hope

TEPCO will make efforts to analyze the problem ... and fully cooperate with our inspections," Fuketa said, adding that TEPCO's ability to keep its license to operate the plant depends on the results of upcoming checks.

TEPCO's president, Tomoaki Kobayakawa, apologized for causing safety concerns and said he and three other company executives are taking 30% salary cuts for six months. "We take the problem seriously and will investigate the cause and pursue efforts to make drastic reforms," he told reporters.

The case raised questions about whether TEPCO has fully learned lessons from the 2011 Fukushima disaster, which was triggered by a massive

earthquake and tsunami but has been largely attributed to the utility's lack of a safety culture.

Critics say the Kashiwazaki-Kariwa plant requires higher security because it is located on the coast facing North Korea. The punishment comes as TEPCO was making final preparations to restart the plant after regulators granted safety approvals for its No. 6 and No. 7 reactors in 2017. Restarting the two reactors is considered crucial for TEPCO to reduce its financial burden in paying for damage caused by the Fukushima disaster.

The penalty does not affect the wrecked Fukushima plant, which is being decommissioned. On Wednesday (7 April), Prime Minister Yoshihide Suga said he will make a final decision "within days" on whether to allow the release into the sea of massive amounts of treated but still radioactive water stored at the plant. TEPCO is expected to run out of storage space for the water in the fall of 2022.

Japan Fisheries Cooperatives Chairman

Hiroshi Kishi rejected Suga's explanation that the release into the sea is the most realistic option, and demanded the government explain how it will address damage caused to the local fishing industry. TEPCO and government officials say radionuclides can be filtered to allowable safety levels, but some experts say the impact on marine life from long-term, low-dose exposure is still unknown.

TEPCO acknowledged in January that there was an unauthorized use of an identification card by a worker to enter sensitive areas at the Kashiwazaki-Kariwa plant last September, along with

shortcomings.

Source: Mari Yamaguchi, *The Associated Press*, https://apnews.com/article/japan-terrorism-asia-pacific-tokyo-b0389bcc9f5ecddd1298c1b314dfbb05?mkt_tok=MDk1LVBOVi04MTMAAAF8Ui6fE8x1slmD-ccePEhaPFcNkjqsK94C uXxv7A3c7MMgqpSKF4ljdaZ3O7Yr cuFq1doW2vVGRbugA2sGODOqKxe2tigqYr9 fRk cjmpunTogeOA, 07 April 2021.

NUCLEAR WASTE MANAGEMENT

CHINA

Construction of Radioactive Waste Disposal Lab Underway

China is building a massive underground laboratory to research disposal technologies for high-level radioactive waste, the most dangerous byproduct of nuclear technology and applications. This is meant to pave the way for a repository that can handle the disposal of at least a century's worth of such materials for tens of thousands of years, the lab's chief designer told China Daily in an exclusive interview.

The lab will be situated in granite up to 560 meters below ground in the Beishan region of Gansu province, said Wang Ju, vice-president of the Beijing Research Institute of Uranium Geology. The underground lab was listed as one of China's major scientific construction projects in the 13th Five-Year Plan (2016-20).

Its surface facilities will cover 247 hectares, with 2.39 hectares of gross floor space. The underground complex will have a total structural volume of 514,200 square cubic meters,

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along with 13.4 kilometers of tunnels, he added.

The lab is estimated to cost over 2.72 billion yuan (\$422 million) and take seven years to build. It is designed to operate for 50 years, and if its research proves successful and the site is suitable, a long-term underground repository for high-level waste will be built near the lab by 2050.

Workers began building a water distribution system for the lab on Dec 28, and roads to it are set to be paved this year, Wang added. "The lab will provide critical support in the safe geological disposal of high-level waste, which is crucial for the sustainable development of nuclear energy in China."

In 1985, the same year that China started building its first nuclear reactor, Chinese scientists had already begun researching how to properly dispose of such waste, which includes harmful substances such as strontium-90, cesium-137 and plutonium-239. All three substances are very damaging to animal cells and the environment. ...

According to the 14th Five-Year Plan (2021-25), China seeks to cut carbon emissions by optimizing its energy consumption structure and raising its proportion of non-fossil energy to around 20 percent in the next few years. Nuclear energy currently makes up about 5 percent of the total energy China produces.

This includes building a new generation of coastal nuclear plants and expanding the nation's nuclear energy generating capacity from about 50 gigawatts last year to 70 gigawatts by 2025. China will also bolster its ability to process nuclear waste, along with promoting technologies including modular small-scale reactors and offshore floating reactors, the plan said.

As of last year, China had 49 nuclear reactors in operation, making it the world's third-largest nuclear energy producer, behind the United States and France. There are 16 nuclear reactors in

construction in China, the most in the world, according to the World Nuclear Association. "We cannot just reap the benefits of nuclear energy and worry about cleaning up its waste later. Development and safety are equally important, and both have always been the two paramount priorities in China's nuclear energy strategy," Wang said.

At the advent of nuclear technologies, humanity's disposal of nuclear waste was littered with controversial ideas and

shortsighted practices, from early nuclear nations dumping it into the oceans to some scientists proposed launching it into space.

Infamous Incident: One of the most infamous incidents came in July 1957, when the US Navy was dumping waste into the sea. Two barrels of radioactive sodium kept floating back to the surface, prompting the Navy to send aircraft to shoot the barrels with machine guns until they sank, The New York Times reported.

The international scientific community eventually agreed that a safe and feasible method to dispose of waste is to permanently bury it deep underground in a tomb of concrete and rock, isolated from all biospheres, natural disasters and human activities for millennia, according to the IAEA.

But this requires scientists to comprehensively survey the repository's environment, both on the surface and underground, Wang said. That includes investigating the site's geological conditions, distribution and flow of groundwater, the types, locations and chemistry of rock types and dozens of other factors. The repository must also be far from populated areas and historical or cultural sites, as well as ecological protection zones, yet it also needs access to infrastructure so that personnel and material can be moved in to build the project, he added.

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massive scientific undertaking, let alone building the underground repository," Wang said, adding Sweden, France and Finland have also completed their site selection and are applying for or building repositories for high-level waste.

Searching for candidate sites alone is already a massive scientific undertaking, let alone building the underground repository," Wang said, adding Sweden, France and Finland have also completed their site selection and are applying for or building repositories for high-level waste.

on the candidate site for the lab in Gansu province, Wang said. Fruitful exchanges and long-term collaboration between the IAEA and the China Atomic Energy Authority played a constructive role in China's geological disposal of nuclear waste, he said. ...

As for China, it took hundreds of scientists and engineers 35 years of drilling boreholes in isolated areas across the country in order to finally decide

Source: Zhang Zhihao, China Daily, <http://global.chinadaily.com.cn/a/202104/08/WS606e3b7ba31024ad0bab4108.html>, 08 April 2021.



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