



OPINION – Nicholas L. Miller

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The U.S. Shouldn't Write Off Nuclear Nonproliferation and Arms Control

The past several years have not been kind to nuclear arms control and nonproliferation efforts. Whether in East Asia, the Middle East or Europe, nuclear risks are steadily growing, while the fragile restraints that limited nuclear proliferation fall by the wayside. As geopolitical tensions between the great powers rise, these trends are likely to persist or even worsen in the next several years. Unfortunately, we are entering an era where major breakthroughs on arms control and nonproliferation are unlikely. Instead, the U.S. will face the unglamorous but still crucial task of trying to prevent a bad situation from getting worse.

In East Asia, North Korea's nuclear and missile programs continue to advance full steam ahead. In 2022, North Korea conducted the most missile tests of any year in its history, including a number of ICBM, tests, and those tests have continued into 2023. According to recent estimates, North Korea likely possesses 20 to 30 nuclear warheads, though it has enough fissile material to produce significantly more. Pyongyang is moving toward the development of tactical nuclear weapons and has indicated it would be willing to be the first to use nuclear weapons in the event of an

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attack. North Korea's moratorium on ICBM tests, declared during the Trump administration, is clearly no longer operative, and there are indications that the moratorium on nuclear testing may be next to meet its demise.

Not coincidentally, South Korean President Suk Yeol recently declared that Seoul might have to consider acquiring nuclear weapons of its own, signaling a possible revival of its 1970s-era nuclear weapons program, which was shuttered in the face of U.S.

pressure. While these comments were subsequently walked back, they reflect strong

and growing public support for nuclear weapons in South Korea. Meanwhile, in 2021, it was revealed that China is constructing more than 200 new ICBM silos, raising the prospect of a more than tenfold increase in the size of its ICBM force. According to a recent Defense Department report, China could have as many as 1,500 nuclear warheads by 2035, up from around 400 today. This marks a significant departure from China's historically restrained nuclear posture, possibly indicating that Beijing seeks superpower status not just in terms of conventional military capabilities, but in the nuclear realm as well.

In the Middle East, the trends are likewise grim. U.S. and European efforts to revive the Iran nuclear deal, which the Trump administration withdrew from in 2018, have faltered, in part due to Russia's invasion of Ukraine and subsequent Iranian support for the Russian war effort. Iran recently enriched small amounts of uranium to 84 percent, just short of the 90 percent threshold generally considered weapons-grade. Iran's breakout time—or the time it would need to accumulate the necessary amount of weapons-grade fissile material for a warhead—currently stands at roughly 12 days, and it has enough highly enriched uranium to produce material for 5 nuclear weapons within a month if it makes the decision to do so.

On the other side of the Gulf, Saudi Arabia is moving forward with its plans for a nuclear energy program. This has raised alarm bells, as Saudi officials have repeatedly declared they would be

forced to match an Iranian nuclear capability and have indicated an interest in enriching their own uranium. According to recent reporting, the Saudis may be seeking a civil nuclear cooperation agreement with the U.S. with looser nonproliferation restrictions than what Washington demanded from the United Arab Emirates as part of their price for normalizing relations with Israel. As bad as East Asia and the Middle East look, it is Europe where nuclear risks are currently the starkest, as Russia's repeated threats to use nuclear weapons have raised nuclear anxiety to levels not seen since the

Cold War. In an apparent effort to further manipulate this fear of nuclear risk, President Putin recently announced that Russia would suspend its participation in New START, the last remaining treaty limiting the nuclear arsenals of the U.S. and Russia.

While Russian officials have promised to continue to observe the caps on deployed arsenals spelled out in the treaty and suggested they would follow some of its information-sharing provisions as well, the Russian move casts further doubt on whether a treaty can be negotiated to take the place of New START, which expires in 2026. While these worrying nuclear developments have

their own distinct regional characteristics, what they share in common is that they are all partly driven—or at least made harder to address—by rising tensions among the great powers. The ongoing collapse of U.S.-Russia arms control is a direct consequence of growing geopolitical

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hostility between Moscow and Washington.

Increasing tensions between the U.S. and China have helped spur the massive expansion of China's nuclear arsenal. They've also made it unlikely that the two countries will cooperate on addressing the North Korean nuclear threat, which in turns puts more pressure on South Korea to reconsider its nuclear choices. Poor U.S. relations with both China and Russia have complicated efforts to revive the JCPOA, as the Iran nuclear deal is formally known, because the so-called P5+1 signatories—the U.S., Russia, China, France, the U.K. and Germany—no longer present a united front in negotiations with Iran.

And Saudi officials have reportedly calculated that the intensifying geopolitical competition between the U.S., Russia and China will allow them to secure concessions in the nuclear realm from Washington.

As long as these intense geopolitical rifts persist, major arms control and non proliferation accomplishments, while not impossible, are likely to be an uphill climb. Still, precisely because the nuclear trend lines are so concerning, the U.S. must do what it can to manage and mitigate nuclear risks as best as possible. And whether in East Asia, the Middle East or Europe, there are in fact steps it can take that may help head off the worst-case scenarios. With North Korea, the U.S. should consider at least tacitly abandoning the unrealistic goal of Pyongyang's denuclearization, which hampers negotiations between the two sides and incentivizes risktaking by both sides, as highlighted

by the 2017-2018 North Korean nuclear crisis.

Such a policy change would increase the odds of negotiating limits to North Korean testing or production of fissile material, which could reduce the threat North Korea's arsenal poses to the U.S., South Korea and Japan. Any diplomacy with Pyongyang should be coupled with policies of reassurance toward Seoul and Tokyo, increasing their confidence in the reliability of Washington's extended nuclear deterrent and steering them away from an independent nuclear arsenal. Efforts to secure caps on China's nuclear arsenal are exceedingly unlikely considering the still massive disparities in U.S. and Russian arsenal sizes compared to China's.

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Any diplomacy with Pyongyang should be coupled with policies of reassurance toward Seoul and Tokyo, increasing their confidence in the reliability of Washington's extended nuclear deterrent and steering them away from an independent nuclear arsenal. Efforts to secure caps on China's nuclear arsenal are exceedingly unlikely considering the still massive disparities in U.S. and Russian arsenal sizes compared to China's.

Nevertheless, recent studies point to intermediate steps that could be pursued, such as arrangements for greater transparency and information-sharing on each country's nuclear capabilities and plans. Mechanisms to promote quick and secure communications during a crisis are also worth

pursuing, to guard against the risk of inadvertent escalation of any conflict. In the Middle East, while the prospects of reviving the JCPOA appear bleak, it is still possible that Iran could be deterred from crossing key thresholds in its nuclear program, such as producing 90 percent enriched uranium, withdrawing from the NPT and ultimately assembling nuclear weapons. A recent deal with the IAEA, to resume some transparency measures is promising in this regard, if Iran follows through in its implementation. To further incentivize Iran's compliance, Washington could make clear that

crossing these thresholds would make a future nuclear deal all but impossible.

In the meantime, though such a possibility appears dim at present, the U.S. should remain open to interim “less for less” deals with Iran short of reviving the JCPOA, whereby Tehran would freeze or roll back elements of its enrichment program in exchange for limited sanctions relief. With Saudi Arabia, the U.S. could seek to influence its nuclear plans by offering aid to its civilian program in exchange for accepting transparency measures such as the IAEA’s Additional Protocol. This would both make it more likely that any Saudi attempt to develop a weapons program would be detected and also give the U.S. leverage over the Saudi nuclear program.

With Russia, the U.S. should keep the door to arms control negotiations open, while incentivizing Moscow to fulfill its pledge of abiding by New START’s limits by doing the same with its own nuclear arsenal. The demise of New START does not make a major new quantitative arms race inevitable, and Russia may be hesitant to go down this path given its relative resource constraints vis-à-vis both the U.S. and China. In the realm of nonproliferation and arms control, success is often measured by highly visible achievements, like the landmark treaties between the U.S. and Russia or the short-lived breakthrough of the JCPOA.

It is important to remember, though, that many of the most important successes in this area are “dogs that did not bark”: nuclear crises and wars avoided, arms races delayed or averted, and countries that considered developing nuclear weapons but ultimately were persuaded not to. It is in this latter domain that U.S. efforts are likely to bear the most fruit in the next several years.

Source: <https://www.worldpoliticsreview.com/us-nuclear-missiles-weapons-non-proliferation-north-korea-china/>, 24 March 2023.

OPINION – Neeraj Bali

Russia’s Decision to Deploy Nuclear Weapons in Belarus

The announcement by Russian President Vladimir Putin that his country would deploy nuclear weapons in Belarus has been chiefly met with stoic indifference. Usually, any development that signals ‘escalation’ of nuclear activity would cause disquiet – but the relative non-reaction is not surprising. The world, in general, and the stakeholders in the war on Ukraine are acutely aware that this move has little military significance beyond how it might impact

the morale of the soldiers currently jousting on the plains of Ukraine.

The fact is that Russia possesses a large arsenal of nuclear-capable missiles. Western sources put the number at 5997, marginally more than the nuclear weapons controlled by President Joe Biden. 1588 Russian missiles are deployed – as a part of its strategic forces. The delivery systems for these deadly munitions are varied – while the bulk of them are designed to be launched from ground stations, the

remainder is distributed among submarines and heavy bomber bases. It is common knowledge among experts that Russia has six nuclear missile fields in locations such as Kozelsk, Tatishevo, Uzhur, Dombarovsky, Kartalay, and Aleysk. It also has nuclear missile submarines based out of naval bases at Nerpich’ya, Yagel’Naya, and Rybachiy

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and nuclear bombers at Ukrainka and Engels air bases.

The numbers are misleading. The two archenemies need only a fraction of these to destroy each other many times. That realisation had driven the two countries from climbing from the astounding peak of Cold War status when the Soviet Union possessed 45,000 nuclear warheads and the US 30,000.

Why is the current move largely bereft of any military significance? And why has the world reacted to it with equanimity bordering on indifference?

The answer to both questions is that the forward deployment of nuclear weapons does not extend the range of Russian strategic reach. The range of the Russian ballistic missiles is such that the current Russian deployments can fully hit every Western target. Moving a few tactical nuclear weapons into Belarus does not alter or enhance that reality. It is pure optics – pins on a map might graphically indicate that the looming danger of a nuclear strike is closer to Kyiv, but the fact is that many locations in Russia – the areas of Bryansk and Kursk – are as close.

Another reason why Putin's declaration did not set the cat among the pigeons is the fact that it has been on the anvil for a long time. After a referendum in 2022, just ahead of the Russian invasion, Belarusian President Alexander Lukashenko amended his country's constitution that legislated neutrality during a war. Several months preceding this change, he had already offered to host Russian nuclear weapons on his country's territory. The West expected this move. The US dismissed it, asserting it warranted no

readjustment of its nuclear posture.

What, then, is the military significance of this sabre-rattling? At best, it is designed to shore up the morale of Russia's forces, which are still locked in a slogging match 400 days after the 'special operations' began. Naturally, the move is also aimed at denting the morale of the Ukrainian

forces, which are awaiting a fresh offensive by Russia in the near future. It is a stratagem to act as a 'force multiplier' via information warfare.

The war in Ukraine has had its twists and turns. The Russian assumptions of rolling Ukrainian armed forces over have been dashed. Also, Ukraine's counter offensives in Kharkiv and Kherson have

hurt Russia, as has the destruction of 1700 of its armoured vehicles. But the conflict has never reached a threshold that would warrant using nuclear weapons.

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The transfer of weapons envisages moving a few tactical nuclear weapons into Belarus without according their control to the host country. The possibility of their use is less than remote. The significance of the move lies largely in the realm of geopolitics. It is Russia's way of signalling to the West that the expansion of NATO in Europe will not go unanswered.

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West that the expansion of NATO in Europe will not go unanswered. It is a scare tactic to discourage the West from increasing its military support for Ukraine. Possibly, it is also meant for a nudge for negotiated settlement – though no such overt move has been made.

By any stretch of the imagination, this development is not a game-changer. Putin's announcement may have caused a minor ripple

in the ocean of geopolitics. But it is just that – a temporary ripple that did not survive even a few news cycles.

Source: Maj Gen Niraj Bali is an Indian Army Veteran and is the founder-CEO of Leadscape Advisors. <https://www.financialexpress.com/business/defence-russias-decision-to-deploy-nuclear-weapons-in-belarus-3027574/>, 30 March 2023.

OPINION – Matthew Yglesias

Nuclear Power Takes Up Less Space Than Solar or Wind

Climate change is a global issue, with its most severe impacts falling on people living in low-income countries and its most serious harms happening in the future. In contrast, nature preservation is an issue that is more immediate, more local — and often more compelling. So environmentalists have long sought to link climate objectives to more parochial concerns about habitat conservation or the protection of scenic areas.

A new poll, published by the new climate-focused news site Heatmap, illustrates the limits of this strategy. Asked whether it's more important to build out renewable energy as quickly as possible or to go slow "to ensure natural land or wild animals aren't harmed, even if it means taking longer to reduce greenhouse gas-producing emissions," respondents chose the slower approach by an overwhelming 71%-29% margin.... From Virginia to the Bay Area, large-scale solar projects are meeting with opposition that's fueled in part by dirty-energy interests but also by sincere conservationist

One analysis, for example, purports to debunk the idea that an all-renewables grid would be extremely land-intensive. It does that, first, by discussing a model that isn't actually all-renewable — it is a 70% to 85% renewable grid where "most of the remaining generation would come from existing nuclear plants and a small amount from gas plants, carbon capture and storage, hydrogen, and biogas."

One takeaway here is that environmental advocacy groups should reconsider their skepticism of nuclear power. Nuclear plants aren't just zero-emissions, they are much smaller on a per-megawatt basis than renewables. Indeed, they're more than twice as space-efficient as coal power plants. And in many cases, they could be located where current or recently closed coal plants are — taking advantage of existing transmission infrastructure.

concerns. At the end of the day, it's simply a fact that generating electricity from wind and sunshine takes up a lot of space. The US does have plenty of space, and it's possible to envision amber waves of wind farms from sea to shining sea. But that would be a significant alteration of the existing natural and pastoral landscape....

Right now much of the environmental movement is in a bit of a state of denial about these land-use considerations. One analysis, for example, purports to debunk the idea that an all-renewables grid would be extremely land-intensive. It does that, first, by discussing a model that isn't actually all-renewable — it is a 70% to 85% renewable grid where "most of the remaining generation would come from existing nuclear plants and a small amount from gas plants, carbon capture and storage, hydrogen, and biogas." It also argues that wind farms aren't as space-intensive as this 2021 Bloomberg analysis would indicate

because wind turbines themselves occupy a relatively small footprint inside a wind farm. Most of the space, in other words, is space between the turbines. That's true enough. At the same time, it's not exactly a good argument to persuade the conservation-minded: Don't worry about despoiling the landscape. There's a lot of empty space between those large, somewhat noisy metal towers.

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cases, they could be located where current or recently closed coal plants are — taking advantage of existing transmission infrastructure and adding nothing at all to the existing built footprint of the US. Repurposing the space that's already in use to power America's electrical grid isn't the whole solution to decarbonizing the economy, nor does it need to be.

But doing so would dramatically reduce the pressure to speedily build huge quantities of wind and solar plants, allowing renewables to be built on rooftops and in communities that welcome rather than fear them. And while this strategy would involve accepting some ecological impacts in the form of waste storage, it's worth noting that renewables also have some ecological impacts. The conceit that one form of emissions-free energy is "green" and the other isn't a misguided relic based on degrowth fantasies from the 1970s that no current mainstream politician espouses. If the goal is to decarbonize while sustaining living standards, no choice is entirely pure. The climate movement has made the most progress when it has aligned itself with popular local environmental concerns. A wholehearted embrace of the advantages of nuclear power would make that alignment a lot easier.

Source: <https://www.bloomberg.com/opinion/articles/2023-03-26/nuclear-power-is-just-as-green-as-solar-and-wind?leadSource=uverify%20wall>, 26 March 2023.

OPINION – Guy Faulconbridge

What are Tactical Nuclear Weapons, what is Russia's Policy?

Russia has a deal to station tactical nuclear weapons on the territory of neighbouring Belarus, President Putin said on March 22, adding this will not violate non-proliferation agreements. What

are these weapons and what is Russia's policy on them:

What are the Concerns: The US has said the world faces the gravest nuclear danger since the 1962 Cuban Missile Crisis because of remarks by President Putin during the Ukraine conflict, but Moscow says its position has been misinterpreted. Kyiv and its Western allies fear tactical nuclear weapons could be used in battle after President Putin and others warned Russia was prepared to use all its vast arsenal in defence.

What are Tactical Nuclear Weapons: Academics and arms control negotiators have spent years arguing about how to define TNW. The clue is in

Russia has a huge numerical superiority over the United States and the transatlantic NATO military alliance when it comes to TNW: the United States believes Russia has around 2,000 such working tactical warheads, 10 times more than Washington. These warheads can be delivered via a variety of missiles, torpedoes and gravity bombs from naval, air or ground forces. They could even be simply driven into an area and detonated. The US has around 200 such weapons, half of which are at bases in Europe.

the name: they are nuclear weapons used for specific tactical gains on the battlefield, rather than, say, destroying the biggest cities of the US or Russia. Few people know exactly how many TNW Russia has because it is an area still shrouded in traditions of Cold War secrecy. Russia has a huge numerical superiority over the United States and the transatlantic NATO military alliance when it comes to TNW: the United States believes Russia has

around 2,000 such working tactical warheads, 10 times more than Washington. These warheads can be delivered via a variety of missiles, torpedoes and gravity bombs from naval, air or ground forces. They could even be simply driven into an area and detonated. The US has around 200 such weapons, half of which are at bases in Europe. These 12-ft B61 nuclear bombs, with different yields of 0.3 to 170 kilotons, are deployed at six air bases across Italy, Germany, Turkey, Belgium and the Netherlands. The atomic bomb dropped by the United States on the Japanese city of Hiroshima in 1945 was about 15 kilotons.

Who Gives the Russian Launch Order: The president is the ultimate decision maker when it comes to using Russian nuclear weapons, both strategic and non-strategic, according to Russia's

nuclear doctrine. When the Soviet Union collapsed in 1991, Russia had around 22,000 TNWs while the United States had around 11,500. Most of these weapons have been dismantled or are waiting to be dismantled. The ones that remain are stored in at least 30 military bases and silos under the control of the 12th Main Directorate of the defence ministry (12th GUMO) headed by Igor

To prepare a TNW strike, it is likely that President Putin would consult with senior allies from the Russian Security Council before ordering, via the general staff, that a warhead be joined with a delivery vehicle and prepared for a potential launch order. Because President Putin could not predict the U.S. response, Russia's entire nuclear posture would change: submarines would go to sea, missile forces would be put on full alert and strategic bombers would be visible at bases, ready for immediate takeoff.

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Stationing Nuclear Weapons: After the Soviet collapsed in 1991, the US went to enormous efforts to return the Soviet nuclear weapons stationed in Belarus, Ukraine and Kazakhstan to Russia - which inherited the nuclear arsenal of the Soviet Union. Since the weapons were returned in the early 1990s, Russia has not announced any nuclear weapon deployments outside its borders. President Putin said on March 22 the agreement with Belarus would not contravene non-proliferation agreements. The Treaty on the Non-Proliferation of Nuclear

Russia claims that the positioning of tactical nuclear weapons in Belarus by Russia does not violate any international agreements that Moscow has signed because the control over the weapons would remain with Russia just as the U.S. retains control over its nuclear weapons on its allies' territories. Moreover, there have been no arms control agreements between the U.S. and Russia on tactical nuclear weapons unlike in the case of strategic nuclear weapons.

Weapons, signed by the Soviet Union, says that no nuclear power can transfer nuclear weapons or technology to a non-nuclear power, but it does allow for the weapons to be deployed outside its borders but under its control - as with U.S. nuclear weapons in Europe.

Source: <https://www.reuters.com/world/europe/what-are-tactical-nuclear-weapons-what-is-russias-policy-2023-03-25>, 25 March 2023.

OPINION – Uma Purushothaman

Why is Russia Planning to Station Tactical Nuclear Weapons in Belarus?

The Story So Far: In the latest escalation to the Russia-Ukraine war, Russian President Vladimir Putin announced that Russia plans to station tactical nuclear weapons in Belarus. Tactical nuclear weapons refer to small nuclear warheads and delivery systems meant for use on the battlefield or for limited strikes.

Why the Sudden Announcement? Mr. Putin said the announcement was prompted by the U.K.'s decision to supply armour-piercing rounds containing depleted uranium to Ukraine. Depleted uranium munitions augment the ability to overcome defences on tanks and have been described by the United Nations Environment Programme (UNEP) as "chemically and radiologically toxic heavy metal". Russia claims that the positioning of tactical nuclear weapons in Belarus by Russia does not violate any international agreements that Moscow has signed because the control over the weapons would remain with Russia just as the U.S. retains

control over its nuclear weapons on its allies' territories. Moreover, there have been no arms control agreements between the U.S. and Russia on tactical nuclear weapons unlike in the case of strategic nuclear weapons.

As Mr. Putin has said, "The U.S. has been doing this for decades. They have long placed their tactical nuclear weapons on the territory of their allies", referring to U.S. nuclear weapons stationed in Belgium, Germany, Italy, the Netherlands, and Turkey.

Belarus is a member of the Russian-led military alliance, the Collective Security Treaty Organization, as well as the Eurasian Economic Union. Russia leases two military installations in Belarus, both inherited from Soviet times. Moreover, Belarus gets subsidised oil and natural gas imports from Russia.

Interestingly, the announcement contradicts the joint statement made by Mr. Putin and Chinese President Xi Jinping where they asked nuclear states to refrain from deploying nuclear weapons abroad. Russia has already helped Belarus upgrade its warplanes so that they can carry nuclear weapons. It is for the first time ever that Russia is deploying nuclear weapons outside its borders. Stationing such weapons in Belarus will enable Russia to carry out strikes easier and faster.

Why Belarus? A former

Soviet state, which like Kazakhstan and Ukraine handed over its nuclear weapons to Russia after the dissolution of the Soviet Union, Belarus has developed close military and political ties with Russia. It is one of the closest and few remaining allies of Russia. It is predominantly Orthodox like Russia with its population almost entirely-Russian speaking. There are also only a few border controls between the two countries. Belarus is a member of the Russian-led military alliance, the Collective Security Treaty Organization, as well as the Eurasian Economic Union. Russia leases two military installations in Belarus, both inherited from Soviet times. Moreover, Belarus gets subsidised oil and natural gas imports from Russia. As was the case with Ukraine, Russia wants to keep Belarus in its sphere of influence and therefore supports

Belarus, on its part, is happy about Putin's announcement as it says it has long wanted nuclear weapons because of Western pressure aimed at changing its political and geopolitical trajectory. Minsk says that it needs these weapons to counter NATO's military build-up near its borders.

the regime of Belorussian President Alexander Lukashenko (often dubbed 'Europe's last dictator'), which is seen as friendly by Russia.

Belarus' geo-strategic position, between Russia and Ukraine and between Russia and Poland, makes it very important for Russia. It also shares borders with three NATO members — Lithuania, Latvia, and Poland. For long, Belarus has been used as a forward base by Russia for power projection, to give it strategic depth. In fact, Belarus has been used as a launchpad by Russia to send troops and launch strikes in the ongoing war. However, Russia-Belarus relations have had their fair share of trouble.

In 2014, Belarus refused to acknowledge the annexation of Crimea by Russia and even hosted the Minsk talks. It also resisted pressure from Russia to host a permanent military base. However, all this changed in 2020 when Belarus was rocked by anti-government protests following what is widely seen as rigged Presidential elections. Mr. Lukashenko was isolated by the West while Russia helped him with a \$1.5 billion loan, accepting the results of the elections and promising to intervene if required. The protests were suppressed brutally and a referendum in February 2022 changed the country's Constitution which specified that Belarus would be a nuclear-free zone and would remain neutral. However, in March 2021, Belarus had already agreed to the presence of a joint Belarusian-Russian military unit on its territory, effectively ending its neutrality. Since the outbreak of the Russia-Ukraine war, Belarus has time and again supported Russia during voting at the UN General Assembly resolutions. So, now Mr. Putin sees Mr. Lukashenko as a dependable ally. Belarus, on its part, is happy about Putin's announcement as it says it has long wanted nuclear weapons

because of Western pressure aimed at changing its political and geopolitical trajectory. Minsk says that it needs these weapons to counter NATO's military build-up near its borders.

What Lies Ahead? The latest move by the Kremlin clearly escalates the Russia-Ukraine war to an entirely new dimension — the nuclear realm — by bringing tactical nuclear weapons literally next door to NATO members. It is probably also meant to dissuade the West from giving more advanced weapons to Ukraine. But it also gives the West an opportunity to use this pretext to further escalate the war. The move does not bode well for peace.

Source: <https://www.thehindu.com/news/international/explained-why-is-russia-planning-to-station-tactical-nuclear-weapons-in-belarus/article66677163.ece>, 29 March 2023.

OPINION – Global Times

China Exemplar of Responsible Power as it Backs a Nuclear Weapon-Free SE Asia

When the world is under an increasingly urgent and realistic danger of a nuclear war and possible destruction of nuclear non-proliferation, China has once again demonstrated its strong determination as a responsible major power to protect the region from nuclear threats.

On Monday (27 March), during a meeting with the visiting ASEAN Secretary-General Kao Kim Hourn, Chinese State Councilor and Foreign Minister Qin Gang said that China is willing to take the lead in signing the Protocol to the Treaty on the Southeast Asia Nuclear Weapon-Free Zone (SEANWFZ Treaty) and work with ASEAN to advocate solidarity and win-win cooperation, jointly safeguarding regional security and stability.

The SEANWFZ Treaty, also known as the Bangkok Treaty, was signed by all ASEAN members in December 1995, as a commitment to preserve the Southeast Asian region as a region free of nuclear

and other weapons of mass destruction. The Protocol to the SEANWFZ Treaty is open to signature by the five recognized nuclear-weapon states - China, Russia, the US, the UK and France. Once China signs the Protocol, it will be the first of the five permanent members of the UN Security Council to do so.

The SEANWFZ Treaty is ASEAN's concrete implementation of the NPT. Establishing a nuclear weapon-free zone in Southeast Asia is quite important for regional peace and stability, as it has ensured nuclear non-proliferation in the region and helped prevent some extraterritorial countries from using nuclear weapons to flaunt their power in the region.

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The current Asia-Pacific region is again facing nuclear threats. In particular, the AUKUS formed by the US, the UK and Australia is constantly testing the bottom line of nuclear non-proliferation principles, triggering concerns from countries in the region, such as Malaysia and Indonesia.

In a recent opinion piece for the *Global Times*, Malaysian scholar John Pang wrote that "AUKUS is the spearhead for the militarization and polarization of Southeast Asia. It is a raw application of the with-us-or-against-us logic of the rules-based order."

Chinese military expert and TV commentator Song Zhongping believes that there are considerations to deal with AUKUS in China's interest in signing the Protocol. "AUKUS' possible actions may provoke nuclear proliferation in the region, turning Southeast Asia into a training ground for nuclear weapons and an arena for the dangerous arms race," Song said.

For China, it is crucial to ensure that Southeast Asia maintains a peaceful region free of nuclear proliferation for its own safety. But most importantly, China's willingness to sign the Protocol clearly proves the country takes its due

responsibility as a major power that seeks peaceful development. It is in stark contrast to the irresponsible behaviors of the AUKUS countries, especially the UK and the US, both of which are nuclear-weapon states and permanent members of the UN Security Council as China is.

These two countries are supposed to act more proactively to prevent nuclear proliferation, yet they choose to ignore the possible threat of assisting a non-nuclear weapon state in acquiring nuclear submarines. How hypocritical it is when they try to do so while boasting of maintaining world peace and stability!

China's support for ASEAN's efforts to build a nuclear weapon-free zone and willingness to sign the Protocol to the SEANWFZ

Treaty are a clear signal against countries that want to exploit certain issues to arm another country with nuclear technology in the Asia-Pacific, especially in Southeast Asia. China's moves will be just the beginning. Only when more countries, particularly those with nuclear weapons, decide to do the same can regional peace and stability be maintained.

"Twenty years ago, China was the first among ASEAN's dialogue partners to join the Treaty of Amity and Cooperation in Southeast Asia. Now if China signs the Protocol, it will actually set up a good example and encourage other countries, especially other nuclear-weapon states, to follow its steps," said Xu Liping, director of the Center for Southeast Asian Studies at the Chinese Academy of Social Sciences.

It is hoped that not only ASEAN countries but also more countries in the Asia-Pacific region will see the danger that AUKUS poses. We should work

together to make our region a source of peace and stability, rather than living in constant fear of nuclear proliferation and threats.

Source: <https://www.globaltimes.cn/page/202303/1288117.shtml>, 28 March 2023.

NUCLEAR STRATEGY

CHINA

At UNSC, China Speaks Up against Nuclear Powers Deploying Nukes in Third Countries

China's support for ASEAN's efforts to build a nuclear weapon-free zone and willingness to sign the Protocol to the SEANWFZ Treaty are a clear signal against countries that want to exploit certain issues to arm another country with nuclear technology in the Asia-Pacific, especially in Southeast Asia.

China rejects the initiatives of any nuclear powers to deploy their nuclear weapons beyond their own borders. This was stated by the Deputy Permanent Representative of China to the UN Geng Shuang at the

meeting of the UNSC, dedicated to the discussion of Russian President Vladimir Putin's threats to deploy tactical nuclear weapons in Belarus, Ukrinform's own correspondent in New York reports. "[W]e call for the abolition of the nuclear sharing arrangements and advocate no deployment of nuclear weapons abroad by all nuclear weapons states," he said.

The threat or use of nuclear weapons should be opposed, while nuclear proliferation must be prevented, as well as a nuclear crisis. According to China, the international community "should have a heightened sense of urgency to promote talks for peace and create conditions for the early resumption of negotiations.

China also calls on all nuclear-weapon states to "effectively reduce the risk of a nuclear war, and avoid any armed conflict between nuclear weapons." According to the Chinese official, Beijing's proposals "aspects regarding

opposing armed attacks against nuclear power plants or other peaceful nuclear facilities." "[N]uclear weapons must not be used and nuclear war must not be fought," he emphasized. The threat or use of nuclear weapons should be opposed, while nuclear proliferation must be prevented, as well as a nuclear crisis. According to China, the international community "should

have a heightened sense of urgency to promote talks for peace and create conditions for the early resumption of negotiations.”

As reported by Ukrinform, the President of the European Commission, Ursula von der Leyen, during a speech at the European Policy Center (EPC) in Brussels, stated that China, as a permanent member of the UN Security Council, must protect the provisions and principles of the UN Charter and promote world stability and peace. Its attitude to the Russian war against Ukraine will be a decisive factor for the further development of relations between the EU and China, she said.

Source: <https://www.ukrinform.net/rubric-politics/3690068-at-UNSC-china-speaks-up-against-nuclear-powers-deploying-nukes-in-third-countries.html>, 31 March 2023.

CHINA–RUSSIA

Nuclear War Must Never Be Fought – Joint Statement by Russia, China

A nuclear war can't be won and must never be fought, Russia and China said in a joint statement published by the Kremlin on March 21. "Underlining the importance of the joint statement by the leaders of the five nuclear-weapon states on the prevention of nuclear war and the prevention of an arms race, sides reiterate that a nuclear war cannot be won and must never be unleashed," the statement read. Moscow and Beijing also called on nuclear states to abide by agreements signed between nuclear states. "The Parties confirm that the NPT is the cornerstone of the international mechanisms for nuclear disarmament and the international regime for the non-proliferation of nuclear weapons. The Parties reaffirm their commitment to their obligations under this Treaty and will continue to coordinate efforts to preserve and strengthen the Treaty in the interests of maintaining international peace and security,"...adding that measures to reduce

strategic risks should be included in efforts aimed at reducing tensions amid worsening relations between nuclear states. In addition, the statement said that nuclear powers should not deploy nuclear weapons abroad and remove the ones that are already deployed in other countries.

Source: <https://www.urdupoint.com/en/world/nuclear-war-must-never-be-fought-joint-stat-1663364.html>, 21 March 2023.

NORTH KOREA

Kim Jong Un Oversees Launch of Nuclear-Capable Underwater Drone

North Korea says it has tested an underwater drone that can unleash a "radioactive tsunami". The "secret weapon" was put in the waters off South Hamgyong province on March 21...It cruised

for over 59 hours at a depth of 80 to 150 metres and was detonated off its east coast...But analysts urge caution on North Korea's claim about the capabilities of the new weapon. Tensions on the Korean peninsula have been running high, as the US and South Korea concluded the largest joint field exercises in five years on March 21. South Korea President Suk-yeol said on March 24 he

Moscow and Beijing also called on nuclear states to abide by agreements signed between nuclear states. "The Parties confirm that the NPT is the cornerstone of the international mechanisms for nuclear disarmament and the international regime for the non-proliferation of nuclear weapons. The Parties reaffirm their commitment to their obligations under this Treaty and will continue to coordinate efforts to preserve and strengthen the Treaty."

would "make sure North Korea pays the price for its reckless provocations". Dubbed "Haeil", Korean for tsunami, the North's weapon is designed to attack enemy vessels and ports by setting off a "super-scale" radioactive wave.... "This nuclear underwater attack drone can be deployed at any coast and port or towed by a surface ship for operation".... North Korean leader Jong Un supervised this exercise, and said it should serve as a warning for the US and South Korea to "realise the DPRK's unlimited nuclear war deterrence capability being bolstered up at a greater speed"....

North Korea's latest weapon appears to be emulating Russian Poseidon torpedoes, said to be capable of spawning radioactive ocean swells

and nuclear tsunamis that could destroy coastal cities in the US. This weapon is the first of its kind.... "It is very difficult to be detected in advance by any reconnaissance or interceptor assets that South Korea and the United States have so far. North Korea is showing a behavioural pattern of responding with 'nuclear weapons' to all military responses against the past, ongoing and future [US-South Korea] joint exercises".... Pyongyang's latest claim "should be met with scepticism.... It is clearly intended to show that the Kim regime has so many different means of nuclear attack that any pre-emptive or decapitation strike against it would fail disastrously" South Korean President Yoon said North Korea was "advancing its nuclear weapons by the day and carrying out missile provocations with an unprecedented intensity". He made the comments at a ceremony marking West Sea Defence Day, an annual holiday to commemorate the soldiers who died while defending the Northern Limit Line, a disputed maritime border between the Koreas...North Korea has become more assertive in its nuclear strategy under Kim Jong Un, who has overseen much of its recent development of its weapons programme, and four of the six nuclear tests so far.

Source: <https://www.bbc.com/news/world-asia-65060884>, 25 March 2023.

RUSSIA

NATO Condemns 'Dangerous' Russian Nuclear Rhetoric

Nato has condemned Russia's "dangerous" and "irresponsible" rhetoric after President Putin's

decision to station tactical nuclear weapons in Belarus. The organisation is "closely monitoring" the situation and said the move would not lead it to change its own nuclear strategy. The US said it did not believe Russia was preparing to use nuclear weapons. Belarus shares a long border with Ukraine, as well as with Nato members Poland, Lithuania and Latvia. Ukraine has called for an emergency meeting of the UN Security Council to address the potential threat of President Putin's announcement on March 22. President Putin said Moscow would not be transferring control of its arms to Minsk and that Belarusian leader Alexander Lukashenko - a firm ally of the Kremlin and supporter of its invasion of Ukraine - had long raised the issue with him....

A small number of Iskander tactical missile systems, which can be used to launch nuclear weapons, have already been transferred to Belarus, President Putin said in his address on March 22. This will be the first time since the mid-1990s that Moscow will have based nuclear arms outside the country. The Soviet Union's collapse in 1991 meant weapons became based in four newly-independent states - Russia, Ukraine, Belarus and Kazakhstan - with the transfer of all warheads to

Russia completed in 1996. Russia will start training crews to operate the weapons from fourth week of March. The construction of a storage facility for tactical nuclear weapons in Belarus will be completed by July 1, President Putin said. The announcement comes only days after Chinese President Xi's visit to Moscow, during which Russia and China issued a joint statement saying, "all nuclear powers must not deploy their nuclear weapons beyond their national territories, and they must withdraw all nuclear weapons deployed abroad".

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Source: <https://www.bbc.com/news/world-europe-65081575>, 27 March 2023.

Russia Stops Sending Nuclear Arms Info to US

Russia will no longer share detailed information on its nuclear weapons with the United States as outlined in the New START treaty, a senior official in Moscow has said, as Russia's military began drills with its Yars ICBM launchers in Siberia while fighting in Ukraine rages and tension with the US mounts.

Deputy Foreign Minister Sergei Ryabkov told Russian news agencies that Moscow had halted all information exchanges with Washington after suspending its participation in the New START nuclear arms treaty last month. "There will be no notifications at all,"

Ryabkov said in remarks reported by Russian news agencies when asked if Moscow would also stop issuing notices about planned missile tests. "All notifications, all kinds of notifications, all activities within the framework of the treaty will be suspended and will not be conducted regardless of what position the US may take," he said.

The US said that it would cease providing Moscow with detailed data on its nuclear weapons stockpiles in response to Russia's suspension of participation in New START. "Russia has not been in full compliance and refused to share data which we ... agreed in New START to share biannually," John Kirby, the US National Security Council spokesperson said. "Since they have refused to be in compliance ... we have decided to likewise not share that data," he said.

A semi-annual exchange of information between Russia and the US on such issues as their number of nuclear warheads and nuclear-capable bombers on certain bases had been an important measure of the New START treaty. Last month, President Vladimir Putin suspended Russia's participation in the treaty, saying Moscow could

not accept US inspections of its nuclear sites under the agreement when Washington and its NATO allies have openly declared Moscow's defeat in Ukraine as their goal.

Moscow emphasised that it had not withdrawn from the START pact altogether and would continue to respect the caps on nuclear weapons the treaty sets. Russia's foreign ministry had also said that Moscow would keep notifying the US about planned test launches of its ballistic missiles – a key agreement between Washington and Moscow. Speculation that Ryabkov's comments might also refer to Russia's suspension of information on ballistic missile launches – a hugely provocative move – under the 1988 agreement was quickly discounted. ...

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Source: <https://www.aljazeera.com/news/2023/3/30/start-treaty-russia-stops-sending-nuclear-arms-info-to-us>, 30 March 2023.

BALLISTIC MISSILE DEFENCE

GERMANY-ISRAEL

Germany Moving Ahead with Israeli Arrow-3 Defense System Purchase: Report

Germany is moving ahead with its planned acquisition of the Israeli-made Arrow-3 anti-ballistic missile defense system...The announcement was made after German Chancellor Olaf Scholz met with US President Biden earlier in March to discuss defense issues. The chancellor was given approval in principle by the US to purchase the Arrow 3 missile system for 3 billion euros (\$3.1 billion). According to the report, the German defense ministry will sign a letter of intent to purchase the system in around two weeks. However, the acquisition needs parliamentary approval, raising concerns that it may face further delays until the fall session.

Long-Awaited Approval: Germany's move to import sophisticated air defense systems is fueled by the ongoing war between Russian and Ukrainian

forces. Berlin recognizes that if Moscow turns its sights on Western Europe, its current defense capabilities may be insufficient to fend off high-powered Russian weapons.

The only missile defense system in service with the German military is the US-made Patriot, leading the government to push for the acquisition of the Arrow-3. However, the plan experienced significant delays because the US did not immediately greenlight the purchase despite months of persuasion by Israel and Germany. "Since then, Defense Minister Benny Gantz and other officials have contacted Washington several times seeking approval for the deal. It is needed as 80 percent of the system's development costs, an estimated \$2.2 billion, came from US taxpayer money."... It also noted that the Arrow-3 includes technological components developed in the US.

Source: <https://www.thedefensepost.com/2023/03/16/germany-israeli-arrow-system/>, 16 March 2023.

SOUTH KOREA

South Korea Speeds Up Full-Fledged Deployment of US Anti-Missile Battery

The South Korean government is speeding up steps to turn a U.S. anti-missile battery deployed here into a permanent installation. The THAAD system, capable of intercepting incoming ballistic missiles, was deployed in Seongju, North Gyeongsang Province in 2017, to deter North Korea's nuclear and missile threats. But the anti-missile system remains as a temporary installation due to fierce backlash from China, as well as residents of Seongju. China claims

that THAAD's radar can be used to spy on its military maneuvers, while residents of the southeastern town are concerned about environmental impacts.

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On March 24, South Korea's Ministry of Defense and the U.S. Forces in Korea (USFK) said they recently held joint drills employing a THAAD remote launcher. It was the first such exercise since the anti-missile battery was deployed here.... "In the face of DPRK's advanced missile threats, the training of our THAAD forces enhanced the units' combat

readiness, combined defense posture within the alliance, demonstrates the ironclad commitment to support and defend the ROK, and further strengthens the security and stability on the Korean Peninsula," the USFK said in a statement....

The government is anticipated to take steps to turn the THAAD base into a permanent installation as early as July, when the Ministry of Environment is expected to draw conclusions on its ongoing environmental impact assessments. Once the environment

ministry gives the green light, the U.S. army will be allowed to initiate a process of building infrastructure and facilities for the THAAD base. While concerns are rising that Seoul's moves may draw fierce protests from Beijing, analysts viewed that China now has fewer retaliatory options compared to the ones it had in 2017, considering its economic slowdown and escalating competition with Washington. "China

will increase threats as the [South] Korean government continues to turn the THAAD unit into a permanent base, but it is unlikely to impose stronger sanctions than the ones we've seen in 2017.... Amid escalating rivalry with the U.S., China seems to be less willing to become enemies with its neighboring countries. And North Korea's evolving nuclear threats justify the South Korean government's rationale for pursuing stronger self-defense"

Source: https://www.koreatimes.co.kr/www/nation/2023/03/205_347846.html, 26 March 2023.

USA

Missile Defense Agency Details Evolving, 'Incremental' Vision for Guam Air Defenses

The Pentagon plans to take a continuous, iterative approach to providing the US territory of Guam with integrated missile defense architecture, but specifically aims to have capabilities to detect and defeat higher-end Chinese threats fielded by 2024.... Appearing at the McAleese FY24 defense programs conference, MDA chief Adm. Jon Hill outlined his evolving Guam plans that expands defenses from solely focusing on a threat from North Korean ballistic missiles to higher-end ones from "near-peers" like China — think less predictable, faster cruise missiles. "[It] is an incremental path. There is no end state," he told reporters. "If you ask me what the [initial operational capability] IOC is, I'll look at you and say there is no IOC because we're going to deliver capability as it's ready and we're going to continue to build it out." However, he noted that the first new "stream" of capabilities is poised to arrive on the island next year.

Hill's comments come as Pentagon leaders spent the week discussing their roadmap to spend \$842

Jon Hill outlined his evolving Guam plans that expands defenses from solely focusing on a threat from North Korean ballistic missiles to higher-end ones from "near-peers" like China — think less predictable, faster cruise missiles.

billion in fiscal 2024. Their "Defense of Guam" plans have many moving pieces inside the MDA, Army and Navy budget requests that total nearly \$1.5 billion, according to the Department of Defense Comptroller. For the MDA, that pot is \$801.7 million — \$632.1 million in research, development, test and evaluation activities, and \$169.6 million in procurement.

The services have not yet released all of their budget justification books that are expected to offer more details, but Hill offered a peak at what might be buried inside those documents. For now, the plan will use the Army's delayed Integrated Air and Missile Defense Battle Command System (IBCS) once it is ready to deploy it and the service has enough soldiers available to operate it. Tied in will be four Long Range Discrimination Radars placed along the "periphery of the island, so that gives us 360-degree coverage," Hill said. LRDR is currently in Alaska and used as part of the US Ground-Based Midcourse Defense anti-ballistic missile system. The Army's Lower Tier Air and Missile Defense Sensor (LTAMDS) and Sentinel radars will also be used.

The evolving plan also includes a mix of launchers tied into the IBCS like the THAAD, currently on the island, as well as Patriot launchers, and the aforementioned land-based variant of the Aegis vertical launch system. That list also includes the Army's future Enduring Shield air defense missile launcher.

MDA is also leveraging a version of the land-based

Aegis ashore system to include the missile launchers and enhanced mobile radars dubbed the "AN/TPY-6." (The "S" in SPY-7 radar stands for water while the "T" in Lockheed Martin's TPY-6 radar refers to the transportable.) "We're taking radars that are normally on a deck house of a ship, or in a big facility like we have in Alaska, and we're putting in erectable trailers so that we can move them around and emplace them" The evolving plan also includes a mix of launchers tied into the IBCS like the THAAD, currently on the island, as well as Patriot launchers, and the aforementioned land-based variant of the Aegis vertical launch system. That list also includes the

Army's future Enduring Shield air defense missile launcher (also called the Indirect Fire Protection Capability Increment 2, or IFPC Inc 2) paired with either Raytheon's ground-launched AIM-9X Sidewinder missile or a second interceptor not yet identified....

Source: <https://breakingdefense.com/2023/03/missile-defense-agency-details-evolving-incremental-vision-for-guam-air-defenses/>, 16 March 2023.

NUCLEAR ENERGY

CHINA

New Technique can Tell Apart Spent Nuclear Fuel from Six Reactor Types

Scientists in China have developed a technique to identify whether some nuclear fuel originated in one of six types of nuclear reactors. Importantly, their technique can reliably distinguish between spent fuel from two common kinds of reactors that have historically presented a challenge to scientists. Nuclear fuel is a highly regulated material because of its destructive potential. Governments, regulators, and militaries maintain detailed inventories to safeguard it. Nuclear forensics uses analytical methods to identify the origins of nuclear materials and whether they were used for military applications. In the current study, the scientists used experimental data and machine-learning (ML).

Fuel from which Reactors is Hard to Identify Uniquely?: Spent fuel from boiling water reactors (BWRs) is hard to differentiate from that from PWRs. This is because both "use water as moderator and have similar thermal neutron spectra, so they are quite similar in neutron reaction mechanism".... The group used experimental data instead of simulations, whose accuracy is unknown.

How Do is Nuclear Fuel Identified?: The reactor type, the fuel's exposure time inside the reactor,

and the extent of the fuel's enrichment can uniquely identify spent nuclear fuel. For nuclear fuels, 'enrichment' refers to the amount of the fissile isotope, such as uranium-235, that the fuel compound, like uranium dioxide, contains. Using a database that contains the composition of different isotopes in spent fuel from reactors over 50 years, the researchers developed equations that related these quantities to each other. They assumed based on past work by other scientists that the relationship between exposure time and the ratio of isotopes, for example, could be represented by a linear equation.

Once they had an equation, they applied it to different isotope ratios in the database. Where their equation's solution differed from the table value, they tweaked the equation until it fit. If one quantity can be determined through other measurements, like gamma-ray emissions from the spent fuel, the team could calculate the values of the other two quantities using the equation.

What is the Issue with BWRs v. PWRs?: They also

trained data from the database to develop three ML models to distinguish fuel from BWRs from that from PWRs. In BWRs, the fuel rods are submerged in water. When nuclear fuel undergoes fission, it releases heat, boiling the water. The resulting steam drives a turbine. In PWRs, the fuel rods aren't exposed to the water; only the heat is exchanged. A material called the moderator slows neutrons down so that they have just the right energy to trigger fission. Such neutrons are called thermal neutrons. It's hard to say if spent fuel is from a BWR or a PWR because the energies of the thermal neutrons are similar in both reactors. So the resulting nuclear reactions similarly affect and transform the nuclear fuel.

What did the ML Model Find?: The group's best ML models were able to correctly identify 91% of fuel from BWRs and 95% of fuel from PWRs. Among others, the model used a common

The group's best ML models were able to correctly identify 91% of fuel from BWRs and 95% of fuel from PWRs. Among others, the model used a common technique called logistic regression: based on studying a dataset of independent variables, the model estimated the chance that an outcome that depends on these variables will occur.

technique called logistic regression: based on studying a dataset of independent variables, the model estimated the chance that an outcome that depends on these variables will occur. "There was no explicit information about the accuracy of discriminating between PWRs and BWRs" in older papers.... A 2014 study, to which he pointed, used a simulation plus ML technique with a low classification-error-rate, yet still reported difficulty separating BWRs from PWRs. "Previous works, based on simulation data," could differentiate between the reactors whereas "our work, based on experimental data, explicitly concludes which reactor type has been used to irradiate the sample."

Source: <https://www.thehindu.com/sci-tech/science/new-technique-can-tell-apart-spent-nuclear-fuel-from-six-reactor-types/article66644652.ece>, 26 March 2023.

EU

EU Leaders Remain Deadlocked on Classification of Nuclear Energy

The EU remains deadlocked over whether to recognise nuclear power as equal to renewable energy, as France and Germany sparred over new allies at a summit. French president Macron, whose government has led a push for more favourable treatment of nuclear energy, discussed the handling of the fuel with German chancellor Scholz at a breakfast meeting on March 24 as the two sides clash over the treatment of the fuel. Following the meeting, the French president told journalists that he was hopeful of finding an agreement with Germany, which is one of several countries opposing French efforts to have nuclear recognised in multiple legislative files related to the green transition. "I think we'll find an agreement, we're in the process of finding one on hydrogen and on other topics in order to preserve technological neutrality"

The recognition of nuclear power as a low-carbon energy source is a key fight for France as it tries to ensure more funding can be directed towards its existing nuclear fleet. Almost half of its 56 reactors had to be closed last year for extensive maintenance work to mend cracks. Nuclear power plants generated close to 70 per cent of France's electricity in 2021.

The recognition of nuclear power as a low-carbon energy source is a key fight for France as it tries to ensure more funding can be directed towards its existing nuclear fleet. Almost half of its 56 reactors had to be closed last year for extensive maintenance work to mend cracks. Nuclear power plants generated close to 70 per cent of France's electricity in 2021. Ursula von der Leyen, European Commission president, said on the first day of a two-day EU leaders' summit in Brussels, that nuclear could "play a role" in Europe's decarbonising effort, adding that only "cutting edge" nuclear technology might get access to simplified rules and incentives in the EU's recently launched draft net zero Industry Act and that it would not be eligible for all the benefits of the legislation. The kind of technology she was referring to are the small modular reactors that are under development in several countries including France. Germany is similarly cautious. It is not opposed to the use of nuclear in the production of hydrogen — which was the topic of a joint declaration with French ministers on January 22 — but Berlin is not willing to treat nuclear energy as equivalent to renewables such as wind or solar, which would give it privileged access to EU funding.

Belgian's PM De Croo...that countries should take a "pragmatic" approach, but Austria and Luxembourg are ideologically opposed to nuclear power and are suing the commission for giving nuclear power a "green" label in its framework for sustainable investments. In France's camp, Polish PM Morawiecki...that nuclear power should be eligible for EU financing. Nuclear energy "absolutely should be given the same status [as solar and wind power] because we do not have technology to store energy from renewables".... Warsaw last year discussed partnering with the US and France to develop nuclear power in Poland in line with its plans to commission its first nuclear plant in 2033....

The EU has set itself a target of reaching net zero emissions by 2050, while both Russia and China have committed to reaching the same goal 10 years later. A senior German official said ...that the Franco-German joint declaration in January, while acknowledging the role of low carbon sources of energy such as nuclear, stressed how important it was to “safeguard...the overall ambition level of the renewable target”. “In other words, if we were to make nuclear energy equivalent to renewables, we’d reduce the ambition level of renewables,” he said. Nuclear could, he said, contribute to decarbonisation efforts, “but it’s just not a source of renewable energy. And France signed up to that.”

Source: <https://www.ft.com/content/0fe8cf12-9664-49e1-91b4-3e9edbbc5fdb>, 25 March 2023.

UK

Government Signs £2.9m Moon Base Nuclear Power Deal with Rolls-Royce Published

Rolls-Royce scientists and engineers are to research how nuclear power could be used to support a future Moon base. The UK Space Agency has given the Derby-based firm £2.9m to look at ways of powering future lunar settlements. The company has been asked to demonstrate how nuclear micro-reactors could extend the duration of future missions to the Moon. The government said the deal would boost the UK’s space industry and create skilled jobs. The UK Space Agency said it wanted to establish a new power source to support systems for communications, life-support and scientific experiments on the Moon.

The agency’s chief executive Dr Paul Bate said: “We are backing technology and capabilities to support ambitious space exploration missions and boost sector growth across the UK....Developing space nuclear power offers a unique chance to

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support innovative technologies and grow our nuclear, science and space engineering skills base...This innovative research by Rolls-Royce could lay the groundwork for powering continuous human presence on the Moon, while enhancing the wider UK space sector, creating jobs and generating further investment.” Rolls-Royce said it wanted to have a reactor ready to send to the Moon by 2029.

The company will work with the University of Oxford, University of Bangor, University of Brighton, University of Sheffield’s Advanced Manufacturing Research Centre (AMRC) and Nuclear AMRC on the project. The UK Minister of State at the Department of

Science, Innovation and Technology, George Freeman, said: “Space exploration is the ultimate laboratory for so many of the transformational technologies we need on Earth, from materials to robotics, nutrition, cleantech and much more...As we prepare to see humans return to the Moon for the first time in more than 50 years, we are backing exciting research like this lunar modular reactor with Rolls-Royce to pioneer new power sources for a lunar base”....

Source: <https://www.bbc.com/news/uk-england-derbyshire-64982477>, 17 March 2023.

USA

A New Nuclear Reactor in the US Started Up Earlier this Month

Nuclear power has its pros and cons. Right now, the U.S. seems to be embracing its advantages. Earlier this week, Georgia Power announced that its Vogtle Unit 3 reactor has safely reached ‘initial criticality.’

Nuclear power has its pros and cons. Right now, the U.S. seems to be embracing its advantages. Earlier, Georgia Power announced that its Vogtle Unit 3 reactor has safely reached ‘initial criticality.’ “A reactor achieves criticality when the nuclear

fission reaction becomes self-sustaining,” the company said in a statement. “Achieving initial criticality is necessary to continue the startup of the Unit in order to generate sufficient heat for the production of electricity.”

Nuclear Regulatory Commission spokesperson Scott Burnell told CNBC that this marked the first nuclear reactor to achieve initial criticality since May 2016. Georgia Power expects Vogtle Unit 3 to be fully in service in May or June this year. The company's CEO said that the unit should be able to produce “clean and emission-free energy for the next 60 to 80 years.”

Given the global energy crisis, more nuclear reactors could come online. So for savvy investors, it might be a good time to check out some nuclear energy stocks. Here's a look at two that Wall Street analysts like — and another method to gain exposure if you don't want to pick winners and losers.

Cameco: Uranium is the mostly widely used fuel by nuclear power plants. Therefore Cameco (CCJ) — a major uranium producer — is well-positioned if nuclear power becomes a more significant source of electricity production. Cameco operates uranium mines in Canada, the U.S., and Kazakhstan. The business is backed by long-term contracts with customers around the world, averaging 21 million pounds per year over the next five years in sales.

Other than mining uranium, Cameco also provides fuel services to nuclear power plants. In 2022, the company's revenue grew 27%. Although Cameco is headquartered in Saskatoon, Saskatchewan, Canada, its shares trade on both the Toronto Stock Exchange and the New York Stock Exchange. Raymond James analyst Brian MacArthur has an 'outperform' rating on Cameco's Canadian-listed shares and recently raised the price target to C\$48 — roughly 37% above where

the stock sits today.

NuScale Power: NuScale Power (SMR) develops small modular nuclear power reactors for power generation. The business started out as a university research project in 2002. In 2020, it became the first company to have its small modular reactor design approved by the Nuclear Regulatory Commission. NuScale Power has several projects planned ahead. Notably, it will build a six-module plant at the Idaho National Laboratory in Idaho Falls that will generate 462 megawatts of carbon-free electricity. The plant is expected to be fully operational by 2030.

Guggenheim analyst Shahriar Pourreza has a 'buy' rating on Nuscale Power and a price target of \$18. Since the stock trades at around \$8.50 today, the price target implies a potential upside of greater than 100%.

ETFs: Exchange-traded funds have been gaining popularity in recent years. You can think of an ETF as a portfolio of stocks. And because ETFs trade on major exchanges, it's very convenient for investors to buy and sell them. You can use ETFs to tap into the nuclear energy sector, too. For instance, the VanEck Uranium+Nuclear Energy ETF (NLR) is an ETF that tracks the performance of companies involved in uranium mining, the construction, engineering and maintenance of nuclear power facilities, the production of electricity from nuclear sources, and providing equipment and services to the nuclear power industry. The fund currently holds 24 stocks. Then there's also the Global X Uranium ETF (URA), a targeted play on uranium mining. The fund provides exposure to companies involved in uranium mining and the production of nuclear components. It currently has 47 holdings.

Source: Jing Pan, <https://finance.yahoo.com/news/nuclear-reactor-us-started-last-120000409.html>, 31 March 2023.

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NUCLEAR COOPERATION

CHINA–RUSSIA

Russia and China Deepen Partnership in Nuclear Energy; Ink Long Term Nuclear Deal

Russia's state-run nuclear energy company Rosatom stated on March 22 that Russia and China are strengthening their nuclear energy partnership and cooperation. They aim to create a roadmap for future collaboration in the development of so-called fast-neutron reactors.... The comprehensive nuclear programme between China and Russia paves the way for bilateral ties and cooperation and also shapes global nuclear market. 'Key areas related to fast-neutron reactors,' says the linked nuclear agreement: The agreement inked by Rosatom and the China National Nuclear Corporation focuses on deepening present collaboration and starting new projects. It includes "key areas related to fast-neutron reactors, the production of uranium-plutonium fuel and the management of spent nuclear fuel"....

Several agreements were announced during the three-day visit of Chinese President Xi to Moscow, including the signing of a long-term nuclear pact. Five Russian nuclear reactors are already in operation in China, and four more are now being built, making Russia the largest nuclear supplier to the communist state. In the Jiangsu province of eastern China, Rosatom started building the Xudabu-4 reactor as well as the Tianwan-8 reactor the year before. Operations are expected to start between 2026 and 2028, and the reactors will be fuelled by third-generation pressurised water reactor technology provided by Rosatom. Each site's development and

Several agreements were announced during the three-day visit of Chinese President Xi to Moscow, including the signing of a long-term nuclear pact. Five Russian nuclear reactors are already in operation in China, and four more are now being built, making Russia the largest nuclear supplier to the communist state.

The proposed 462 MWe facility would utilise NuScale's SMR technology. In addition, cooperation will include USD1 million in new funding for capacity-building for Indonesia, building on its existing partnership under the US Department of State Foundational Infrastructure for the Responsible Use of SMR Technology (FIRST) Program. This includes support in areas such as workforce development, stakeholder engagement, regulations and licensing.

construction expenses are expected to total \$1.7 billion....

Source: <https://www.republicworld.com/world-news/russia-ukraine-crisis/russia-and-china-deepen-partnership-in-nuclear-energy-ink-long-term-nuclear-deal-articleshow.html>, 23 March 2023.

USA–INDONESIA

USA, Indonesia Announce Partnership on SMRs

The USA and Indonesia have announced a strategic partnership to help Indonesia develop its nuclear energy programme, supporting Indonesia's interest in deploying SMR technology to meet its energy security and climate goals. A Memorandum of Agreement, as well as affiliated grants and contracts, was signed during the Indo-Pacific Business Dialogue in Bali, Indonesia.

The agreement advances the goals of the Just Energy Transition Partnership (JETP) and will strengthen Indonesia's leadership in the ASEAN region on the deployment of advanced, safe and secure nuclear energy technologies, working toward the goal of net-zero emissions in Indonesia by 2060. Under the agreement, the US Trade and Development Agency (USTDA) has awarded a grant to PLN Indonesia Power to provide assistance to assess the technical and economic viability of a proposed nuclear power plant, to be located in West Kalimantan. It will include a site selection plan, power plant and interconnection system design, preliminary environmental and social impact assessment, risk assessment, cost estimate and regulatory review.

Indonesia Power selected NuScale Power to carry out the assistance in partnership with a subsidiary of Fluor Corporation and Japan's JGC Corporation.

The proposed 462 MWe facility would utilise NuScale's SMR technology. In addition, cooperation will include USD1 million in new funding for capacity-building for Indonesia, building on its existing partnership under the US Department of State Foundational Infrastructure for the Responsible Use of SMR Technology (FIRST) Program. This includes support in areas such as workforce development, stakeholder engagement, regulations and licensing. "This project will advance climate action and clean energy access throughout a critical part of the world and has the potential - as part of follow-on projects - to create thousands of jobs, pave the way for additional SMR projects in Indonesia and the Indo-Pacific region, and uphold the highest standards for nuclear safety, security, and non-proliferation....

Source: <https://world-nuclear-news.org/Articles/USA,-Indonesia-announce-partnership-on-SMRs>, 20 March 2023.

URANIUM PRODUCTION

USA

More Progress towards US Uranium Production Restarts

Uranium production will resume at the Alta Mesa processing plant in early 2024, enCore Energy has announced, making it the company's second producing location following resumption of uranium production at the South Texas Rosita plant which is scheduled for later this year. Meanwhile, supply chain issues have meant a slight delay to the restart of commercial production at Peninsula Energy's Lance project. enCore announced its formal production decision for the resumption of uranium processing at Alta Mesa - which has been

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on standby since 2013 - on 15 March.

The processing plant can reach commercial production levels with limited required capital, from funds on hand, within an estimated 10 months...The fully licensed and constructed in-situ leach (ISL) uranium project and central processing facility has a total operating capacity of 1.5 million pounds U3O8 (577 tU) per year. Alta Mesa historically produced nearly 5 million lbs of U3O8 between 2005 and 2013, when full production was curtailed as a result of low uranium

prices at the time.

Work already under way at the Texas plant includes the construction of equipment staging areas and drill pads in the fully permitted production authorisation area where initial production will take place. Development drilling, production and injection well installation will start in March 2023. Its technical staff are identifying equipment maintenance and limited repair needs at the processing plant's ion exchange system, uranium precipitation, drying and packaging circuits in order to restart production. enCore began initial assessment work on the restart in November 2022 ahead of the closing of its acquisition of Alta Mesa earlier this year, CEO Paul Goranson said. "It is an exciting time at enCore.

The Alta Mesa project consists of two uranium properties, Alta Mesa and Mesteña Grande, with total measured and indicated resources of 3.41 million pounds U3O8 and inferred resources of 16.79 million pounds. The company's three fully licensed ISL facilities - Alta Mesa, Rosita and Kingsville Dome, all of which are in Texas - have a combined potential processing capacity of 3.6 million pounds of uranium per year.

Our 2023 startup of production at Rosita and now, the decision to proceed at Alta Mesa, will bring a reliable domestic low carbon energy source to South Texas and the United States when it is most needed".... The Alta Mesa project consists of two uranium properties, Alta Mesa and Mesteña

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Mesa, Rosita and Kingsville Dome, all of which are in Texas - have a combined potential processing capacity of 3.6 million pounds of uranium per year....

Source: <https://world-nuclear-news.org/Articles/More-progress-towards-US-uranium-production-restart>, 16 March 2023.

NUCLEAR PROLIFERATION

GENERAL

Number of Operational Nuclear Warheads Rose in 2022, Driven by Russia

The number of operational nuclear warheads in the world increased in 2022, driven largely by Russia and China, according to a new report released. At the beginning of 2023, the nine official and unofficial nuclear powers held 9,576 ready-to-use nuclear warheads — up from 9,440 the year prior — which have a “collective destructive power” equal to “more than 135,000 Hiroshima bombs,” according to the Nuclear Weapons Ban Monitor published by the NGO Norwegian People’s Aid.

Source: <https://www.hindustantimes.com/world-news/number-of-operational-nuclear-warheads-rose-in-2022-driven-by-russia-study-101680082056243.html>, 29 March 2023.

RUSSIA

Russia’s Intention to Deploy Tactical Nuclear Weapons in Belarus Violates Non-Proliferation Treaty – MFA

Russia’s intention to deploy tactical nuclear weapons in Belarus is a violation of the Treaty on the Non-Proliferation of Nuclear Weapons. The relevant statement was made by the Ukrainian Foreign Affairs Ministry... “The Russian Federation’s latest statements regarding the intention to deploy tactical nuclear weapons within the territory of Belarus are another provocative step by President Putin’s criminal regime, which undermines the principles of the Treaty on the Non-Proliferation of Nuclear

Weapons, the architecture of nuclear disarmament and the international security system as a whole”.... The ministry emphasized that Russia declares its intention amid the continuation of the unprovoked aggressive war against Ukraine and in view of its failure to win on the battlefield.

“Ukraine appeals to the Belarusian society to prevent the implementation of criminal intentions regarding the placement of nuclear weapons within the territory of Belarus in violation of its obligations under the Treaty on the Non-Proliferation of Nuclear Weapons, which will further transform this country into a hostage of the Kremlin and have catastrophic consequences for its future”.... Additionally, the Ukrainian Foreign Affairs Ministry urged the G7 and EU countries to warn the Belarusian authorities about the far-reaching consequences for Belarus, in case of its agreement to receive tactical nuclear weapons from Russia within its territory. “Ukraine expects effective actions to counter the nuclear blackmail of the Kremlin from the United Kingdom, China, the United States and France, in

Additionally, the Ukrainian Foreign Affairs Ministry urged the G7 and EU countries to warn the Belarusian authorities about the far-reaching consequences for Belarus, in case of its agreement to receive tactical nuclear weapons from Russia within its territory.

particular as permanent members of the UN Security Council, which have a special responsibility for preventing the threats of aggression with the use of nuclear weapons. We demand that an extraordinary meeting of the UN Security Council be immediately convened for this purpose”....

Source: <https://www.ukrinform.net/rubric-polytics/3687705-russias-intention-to-deploy-tactical-nuclear-weapons-in-belarus-violates-nonproliferation-treaty-mfa.html>, 26 March 2023.

NUCLEAR DISARMAMENT

GENERAL

Top UN Official Urgently Calls for De-escalating Nuclear Tensions over Belarus

“The risk of a nuclear weapon being used is currently higher than at any time since the depths of the cold war,” said Izumi Nakamitsu, UN High Representative for Disarmament Affairs. “The war in Ukraine represents the most acute example of

that risk." The Security Council met on the heels of President Vladimir Putin's announcement that it had reached an agreement with its neighbour, which has been an ally in Moscow's invasion of Ukraine, to station non-strategic nuclear weapons inside Belarusian territory, which would be in place for aerial use, by July.

Dangerous Rhetoric: Ms. Nakamitsu said the absence of dialogue and the erosion of the disarmament and arms control architecture, combined with dangerous rhetoric and veiled threats, are key drivers of this potentially existential risk posed by nuclear escalation. "When it comes to issues related to nuclear weapons, all States must avoid taking any actions that could lead to escalation, mistake or miscalculation," she said, recalling that all States parties to the NPT – nuclear-armed States and non-nuclear weapon States alike – must strictly adhere to its commitments and obligations.

"They should return to dialogue to de-escalate tensions urgently and find ways to develop and implement transparency and confidence-building measures," she said, appealing to States parties to the treaty to fully adhere to their obligations and to immediately engage in serious efforts to reduce nuclear risk.

'Nuclear Sharing': The issue of "nuclear sharing", the hosting by a non-nuclear weapon State of a nuclear-weapon State's nuclear weapons, has existed for decades, across regions and under different arrangements pre-dating the NPT, with the exception of the recent Russian announcement, she said. "For the sake of all our security", she echoed the UN Secretary-General's call for Russia and the United States to return to full implementation of the New START Treaty and commence negotiations on its successor.

Russia: 'A Nuclear War Cannot be Won': "We are pursuing cooperation with Belarus without

violating obligations," Russian ambassador and Permanent Representative, Vassily Nebenzia insisted. "We are not transferring nuclear weapons. We are talking about the retrofitting of airplanes and training teams in construction of a storage facility on the territory of Belarus."

Russian tanks would not be in the Ukraine now, if the United States and its allies had not undertaken, what he described, as a coup d'état in Kyiv in 2014, "pumping the Kyiv regime with weapons", he said. Indeed, the US may have already deployed between 100 and 150 nuclear warheads in Europe, he said, recalling Moscow's repeated calls on Washington to "set aside the cold war mentality" by returning US nuclear weapons to its own territory.

Russia must take "all requisite measures" in response to "provocative steps", he said, given the fraying global security architecture, dictated exclusively by Washington, along with London's recent decision to deploy armour-piercing ammunition to Ukraine. "A nuclear war cannot be won", he said.

United States: 'Serious consequences': Russia's suggestion that this intended deployment is justified because of the use of armour-piercing ammunition supplied by Western forces, containing depleted uranium, is "ludicrous", US ambassador Robert Wood said. "Armour-piercing ammunition is in no way analogous to tactical nuclear weapons," he said, adding that the Kremlin is attempting to limit and deter Ukraine's efforts to defend itself, and manipulate matters to win the war.

Russia is seeking to escalate its brutal war rather than to seek peace, he said. Meanwhile, Belarus has recently enacted laws to enable the Russian deployment, he added. Recalling a recent Russia-China security agreement, he said one provision

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stated that “nuclear-weapon States should refrain from deploying nuclear weapons abroad”. “Any use of nuclear weapons in Ukraine would have severe consequences and would fundamentally change the nature of this war,” he said, calling on Russia to reconsider its decision about deploying tactical nuclear weapons inside Belarus.

Source: <https://news.un.org/en/story/2023/03/1135222>, 31 March 2023.

NUCLEAR SAFETY

CHINA

China Presents National Report on Nuclear Safety to IAEA

China presented its national report on nuclear safety during the Joint Eighth and Ninth Review Meeting of the Contracting Parties to the Convention on Nuclear Safety (CNS) on March 23 at the headquarters of the IAEA in Vienna, Austria. Dong Baotong, vice minister of ecology and environment and director of the national nuclear safety administration, presented the report during the meeting. The purpose of the report is to describe the legislative, regulatory and administrative measures that China has taken to fulfill its obligations as a contracting party to the CNS. The national report briefed on the progress and achievements in the construction and operation of China’s nuclear power plants over the past six years, systematically expounded on China’s nuclear safety status and supervision efforts, its follow-up and improvement actions to the Fukushima nuclear accident and the implementation of the Vienna Declaration on Nuclear Safety.

The report highlighted China’s innovative measures on nuclear safety supervision for new-type reactors and shared experience on safeguarding nuclear safety. Dong said that as a nuclear energy power, China has always regarded nuclear safety as an important national responsibility and integrated it into the entire

process of nuclear energy development and utilization. China has always developed the nuclear industry subject to considerations of safety, implemented regulations per the strictest standards, and adapted to the new requirements of the nuclear industry. China will continue to improve the system of policies and regulations on nuclear security and strengthen international exchanges and cooperation on it....

China became the contracting party to the CNS in 1996. Since then, China has maintained a good nuclear safety record for a long time: It ranks among the highest of all countries in terms of nuclear power safety operation indicators. In 2000, 2004, 2010 and 2016, the IAEA conducted four comprehensive reviews of China’s nuclear and radiation safety regulations, giving full recognition to China’s good practices and experiences.

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The CNS aims to commit contracting parties operating land-based civil nuclear power plants to maintain a high level of safety by establishing fundamental safety principles to which states would subscribe. The review meetings are held every three years, in accordance with Article 21(3) of the Convention, and provide the opportunity to review the national reports of all contracting parties.

Source: <https://news.cgtn.com/news/2023-03-24/China-presents-national-report-on-nuclear-safety-to-IAEA-1iqCSPldgrK/index.html>, 24 March 2023.

LIBYA

UN Nuclear Watchdog Says Missing Libya Uranium Found

U.N. inspectors visiting southern Libya found drums containing natural uranium reported missing earlier this month in the chaos-stricken country, the U.N. nuclear watchdog said on March 25. The IAEA said earlier this month that some 2.5 tons of natural uranium stored at a site in the southern town of Sabha had gone missing. Forces

of the Libyan commander Khalifa Hifter said they found the missing material close to the storage site.

In a statement to The Associated Press on March 25, the Vienna-based agency said U.N. inspectors visited the area on March 21 and saw the material being transferred to the storage site. U.N. inspectors found that a “relatively small amount of UOC (Uranium ore concentrate) was still unaccounted for,” it said. The IAEA said, however, there was no immediate radiological risk at the location. The statement said investigations were still underway on the matter including reconciling the quantities of natural uranium at the site with those previously verified by the IAEA. The IAEA said its director-general, Rafael Mariano Grossi, informed member states March 24 about the findings of the visit.

Natural uranium cannot immediately be used for energy production or bomb fuel, as the enrichment process typically requires the metal to be converted into a gas, then later spun in centrifuges to reach the levels needed. But each ton of natural uranium — if obtained by a group with the technological means and resources — can be refined to 5.6 kilograms (12 pounds) of weapons-grade material over time, experts say. The material dates back to the rule of late dictator Gadhafi, who stored thousands of barrels of so-called yellowcake uranium for a once-planned uranium conversion facility that was never built in his decades long secret weapons program.

Estimates put the Libyan stockpile at some 1,000 metric tons of yellowcake uranium under Gadhafi, who declared his nascent nuclear weapons program to the world in 2003 after the U.S.-led

invasion of Iraq. Sabha is located some 660 kilometers (410 miles) southeast of Tripoli, in the country’s lawless southern reaches of the Sahara Desert. Libya has descended into chaos following a NATO-backed uprising that ousted and later killed Gadhafi. The country has for years been split between rival administrations in the east and the west, each backed by armed groups.

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Chadian separatist fighters, who operate in the region, likely attempted to steal the drums after mistaking them for weapons and ammunition. Hifter’s forces provided no evidence for the accusation.

Source: <https://abcnews.go.com/International/wireStory/nuclear-watchdog-missing-libya-uranium-found-98123665>, 25 March 2023.

UKRAINE

Zelensky Visits Troops in Zaporizhzhia as Part of Frontline Tour – and Discusses Nuclear Safety

Ukraine’s president Zelensky handed out medals to troops in southeastern Zaporizhzhia, the latest stage of his tour of frontline regions, as Kyiv’s forces seek to break the back of Russia’s winter offensive before starting their own. It was President Zelensky’s third visit to the front line in less than a week. The president also discussed nuclear safety with IAEA chief, Rafael Grossi, who also travelled to the area, home to Europe’s biggest nuclear power plant. The plant has been occupied by Russian forces for the last year, with Kyiv having regularly raised concerns

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about its condition – although there is no immediate danger.

Source: <https://www.independent.co.uk/news/world/europe/ukraine-war-russia-zelensky-nuclear-putin-b2308912.html>, 28 March 2023.

'Europe's Largest Nuclear Facility in Perilous Situation', Warns UN Nuclear Watchdog

United Nations' nuclear watchdog IAEA warned that the Zaporizhzhia power plant in Ukraine, the largest such facility in Europe is in a perilous situation. The agency has been demanding both nations to set up a security zone around the plant. The IAEA said that the plant needs a reliable power supply to operate pumps that circulate water to cool reactors and pools holding nuclear fuel.... According to reports, following a Russian attack on March 9, the Zaporizhzhia plant has depended on a single backup power line that remains disconnected and under repair. Rafael Grossi, head of IAEA said in a statement, "Nuclear safety at the ZNPP remains in a precarious state." "The last remaining backup 330 kV power line at the plant damaged since March 1, remains disconnected and under repair, again highlighting the fragility of nuclear safety and security at Europe's largest nuclear power plant," Grossi said in a statement.

Grossi warned the situation at the plant remains perilous. "The IAEA Support and Assistance Mission to Zaporizhzhia (ISAMZ) team currently present at the plant was informed that restoration of the line had been planned for March 5, 10 and then 13, but had not been possible. The latest reconnection date is scheduled for March 23".... "If this disconnection from the main power line and repair work is performed while the 330 kV line is not available it will cause a complete loss of power and will make the plant reliant on diesel generators – its last line of defence - for the seventh time" IAEA also said this week, teams of IAEA staff will be travelling to Ukraine to

complete the planned rotation of staff at the four other Ukrainian nuclear facilities, the Khmelnytsky, Rivne and South Ukraine NPPs, as well as the Chernobyl site. Grossi called on Russia and Ukraine to commit to secure nuclear safety and security protection at the plant.

Source: <https://www.theweek.in/news/world/2023/03/23/ukraine-war-europes-largest-nuclear-facility-in-perilous-situation-warns-un-nuclear-watchdog.html>, 23 March 2023.

Increased Combat Around Ukrainian Nuclear Plant, Says Official

Fighting has intensified near a nuclear power plant in Ukraine that is Europe's largest, further increasing the possibility of a war-related nuclear accident, the head of the IAEA said on March 28. "There is an increased level of combat, active combat" in the area of the Zaporizhzhia Nuclear Power Plant, IAEA Director General Rafael Mariano Grossi told The Associated Press in an interview. "My teams there report daily about the attacks, the sound of heavy weaponry. This is practically constant."

Speaking a day before he was to cross the front lines for a second time to visit

the plant, Mr. Grossi said he felt it was his duty to ramp up talks aimed at safeguarding the facility. He met with Ukrainian President Volodymyr Zelenskyy and said he would probably head to Russia in the coming days.

Mr. Grossi has long called for a protection zone to be set up around the plant, which is very near the front line of the war. But so far, an agreement has been elusive. "It is a zone of extreme volatility. So the negotiations are, of course, affected by the ongoing military operations," Mr. Grossi said. "I would not characterise the process for the last few months as one that has not led to any progress."

Heavy Offensives and Counter-offensives: The U.N.'s atomic energy watchdog, which is based in

The IAEA said that the plant needs a reliable power supply to operate pumps that circulate water to cool reactors and pools holding nuclear fuel.... According to reports, following a Russian attack on March 9, the Zaporizhzhia plant has depended on a single backup power line that remains disconnected and under repair.

Vienna, Austria, has a rotating team permanently based at the plant. The power station's six reactors are in shutdown and the plant has received the electricity it needs to prevent a reactor meltdown through one remaining functioning power line. Plant personnel have had to switch to emergency diesel generators several times during the 13-month war to power essential cooling systems.

Military analysts expect the fighting between invading Russian troops and Ukrainian forces will further escalate as spring progresses and the ground hardens, allowing heavy military machinery to advance on the battlefield. "There is talk about offensives, counter-offensives," Mr. Grossi said. "The concentration of troops, concentration of military equipment, heavy weaponry has grown exponentially in the area near to the plant, which of course, makes us believe that the possibility of an accident, of a renewed attack...could grow." While the last direct shelling of the plant occurred in November, the surrounding area was still being hit, the nuclear agency chief said. "We have far more military activity, and more is announced," he said.

Risk of Radiological Accident:

The IAEA head said he has discussed the situation at the highest levels with both sides and was still discussing "different scenarios that could lead" to the creation of a protection zone around the plant. "This proposal is about preventing a nuclear accident. It is not to create any situation which may have a military advantage or disadvantage or a legitimisation of the situation," the nuclear agency head said. "So I have to walk this fine line talking to both, trying to make it so that both understand very well that a radiological accident

... here and also on the Russian side, would be extremely serious and it's something that we really need to avoid."

Source: <https://www.thehindu.com/news/international/increased-combat-around-ukrainian-nuclear-plant-says-official/article66671624.ece>, 28 March 2023.

USA

400,000 Gallons of Radioactive Water Leaked from US Nuclear Power Plant

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About 400,000 gallons of radioactive water has leaked from a nuclear power plant in Monticello, the midwestern US state of Minnesota...The Minnesota Pollution Control Agency (MPCA) said...that state agencies are monitoring Xcel Energy's efforts to clean up "a release of water contaminated with tritium" detected at the company's Monticello nuclear-generating plant.

About 400,000 gallons of radioactive water has leaked from a nuclear power plant in Monticello, the midwestern US state of Minnesota...The Minnesota Pollution Control Agency (MPCA) said...that state agencies are monitoring Xcel Energy's efforts to clean up "a release of water contaminated with tritium" detected at the company's Monticello nuclear-generating plant... Xcel Energy reported the leak to the Minnesota Duty Officer and the US Nuclear Regulatory Commission in late November 2022 after finding unusual results during routine groundwater monitoring. The four-month delay in making public the leak of radioactive water has sparked concerns about public safety and transparency. The MPCA said in a news release that the leak has been stopped and has not reached the Mississippi River or contaminated drinking water sources.

There is no evidence at this time to indicate a risk to any drinking water wells in the vicinity of the plant, the release also read. Tritium is a naturally occurring radioactive form of hydrogen that is produced in the atmosphere. It is a byproduct of the production of electricity by nuclear power plants. Xcel Energy said the leak

came from a water pipe running between two buildings at its Monticello facility and was stopped. The company also said it is monitoring the groundwater plume through two dozen wells while pumping contaminated groundwater through extraction wells.... Xcel Energy is said to be exploring building aboveground storage tanks or installing a retention pond to store water containing tritium that has been collected during ongoing recovery activities.

Once committing to reducing Canada's reliance on the energy source, the Trudeau government has done a U-turn on nuclear in the name of reducing its carbon footprint. "In order to achieve our economic and climate objectives, Canada will need to significantly expand its electric grid," Canadian natural resources minister Jonathan Wilkinson said in 2022 after attending nuclear conferences in Washington.

Source: https://www.business-standard.com/article/international/400-000-gallons-of-radioactive-water-leaked-from-us-nuclear-power-plant-123031900081_1.html, 19 March 2023.

NUCLEAR WASTE MANAGEMENT

CANADA

'We Don't Want It': Great Lakes Lawmakers Reject Canada's Nuclear Waste Proposal

North America has a nuclear waste problem that is almost 150,000 metric tons and growing. There are more than 100 reactors in the U.S. and Canada, but few long-term solutions for storing radioactive waste that takes thousands of years to fully decompose. Lawmakers in northern U.S. border states are certain of one thing — Canada's Nuclear Waste Management Organization, or NWMO, has a multibillion plan that could swap one problem for another. Thirty miles from the shoreline of Lake Huron, 500 meters beneath the bedrock of the Great Lakes Basin, the NWMO wants to bury used fuel bundles in copper containers tunneled into boreholes and sealed with bentonite clay.

Despite the international studies that laud the thinking behind the project that could wind up in South Bruce, Ontario, American lawmakers are vehemently opposed because of its proximity to the Great Lakes...With U.S. President Biden heading to Canada this week, the U.S. lawmakers sense an opening. In a bipartisan resolution

shared with POLITICO...they are urging President Biden to talk to P.M Trudeau about Canada's plan to permanently bury nuclear waste in the Great Lakes Basin. So far 16 Democratic and Republican members of the House have signed on, with more likely to endorse it once it gets to the floor. After a 10-year search, the South Bruce location is one of two sites under consideration. The NWMO, a non-profit founded in 2002 and supported by the country's nuclear industry, says it will reveal its final decision in 2024.

It's Not Just about South Bruce, of Course: For decades, nuclear waste has been stored in decommissioned reactors and other surface-level facilities on both sides of the border. Canada has a complicated history with nuclear power. Once committing to reducing Canada's reliance on the energy source, the Trudeau government has done a U-turn on nuclear in the name of reducing its carbon footprint. "In order to achieve our economic and climate objectives, Canada will need to significantly expand its electric grid," Canadian natural resources minister Jonathan Wilkinson said in 2022 after attending nuclear conferences in Washington. "All sources of non-emitting energy must be considered for this significant challenge — including nuclear." But not everyone in South Bruce is on board the NWMO campaign. Residents and activists have organized rallies, letter-writing campaigns and petitions since the early 2010s. And this summer, the town of 6,000 will hold a referendum vote on whether they want the repository in the first place.

There's Another Problem with the Plan for South Bruce: Americans: South Bruce sits off the beaches of Lake Huron, the body of water that separates Ontario and Michigan from the East; it's what makes the state of Michigan look like a mitten. Lake Huron boasts the longest shoreline of the Great Lakes system and provides drinking water for 30 million people on both sides of the

border. Rep. Dan Kildee's district sits on the other side of the South Bruce lakeshore, in Flint, Mich. It was nearly a decade ago that the water supply there was switched to the Flint River in a secretive cost-cutting measure that poisoned drinking water, creating a public health crisis that killed at least a dozen people. Over the years, Kildee has expressed his concerns with the Canadian embassy in Washington, as well as with the NWMO, a spokesperson for the congressman said. Kildee's office will go so far as to support the idea of a permanent facility, but draws the line at any project that could damage the Great Lakes.

Source: <https://www.politico.com/news/2023/03/22/great-lake-lawmakers-reject-canada-nuclear-waste-proposal-00088210>, 22 March 2023.

JAPAN

Experts Ask Japan to End Nuclear Wastewater Discharge Plan, Warn of Damage to Less Powerful Countries

Japan's plan to dump Fukushima nuclear-contaminated wastewater into the ocean in spring 2023 has sparked widespread concerns and protests throughout Japan and the Pacific countries. A New Zealand-based sociologist has called on Japan to stop nuclear colonialism and targeting less geopolitically powerful countries, saying that countries bordering the Pacific Ocean, including New Zealand, should take legal action to stop the move.

Those who profit from nuclear technologies are responsible for managing the waste, rather than simply passing on the nuclear waste management responsibility to Indigenous peoples and others that are less geopolitically powerful, Dr Karly Burch, a sociology lecturer from the University of Auckland who has been studying the aftermath

Japan is very likely to go ahead with the discharge plan unless a neighbouring country sues Japan at the International Tribunal for the Law of the Sea concerning the proposed radioactive wastewater plan.

of the Fukushima Daiichi nuclear disaster for the past 12 years, told...on March 22. Burch said Japan is very likely to go ahead with the discharge plan unless a neighbouring country sues Japan at the

International Tribunal for the Law of the Sea concerning the proposed radioactive wastewater plan.

She said that Japan is not legally permitted to cause

such pollution in the high seas and there have been lawyers advocating for ending the discharge through a lawsuit, but no country has moved to take Japan to court as it has unfortunately become a sensitive geopolitical issue.

In April 2021, Japan decided to release more than one million tons of Fukushima nuclear-contaminated wastewater into the Pacific Ocean starting from spring in 2023. The wastewater is from the TEPCO's Fukushima No. 1 nuclear power plant, which was severely damaged in the Great East Japan Earthquake on March 11 in 2011.

Burch said she's against the discharge because

Japan is not legally permitted to cause such pollution in the high seas and there have been lawyers advocating for ending the discharge through a lawsuit, but no country has moved to take Japan to court as it has unfortunately become a sensitive geopolitical issue.

TEPCO's scientific studies mostly focus on the chemistry aspects of nuclear pollution, which is not sufficient for estimating the possible impact the radioactive materials will have upon complex biological, ecological,

social, cultural and economic relations. She shared examples of other scientists who felt the same. In December 2022, over 100 marine science laboratories authored a paper voicing scientific opposition to Japan's discharge plan. The Pacific Islands Forum Secretariat held a public seminar on January 18 where a panel of independent, globally respected scientific experts shared their assessment of TEPCO's wastewater discharge plan and stated that TEPCO's scientific studies were "incomplete, inadequate, and inconsistent."

Burch pointed out that TEPCO and the Japanese government are showing direct disregard for the

sovereignty and self-determination of Pacific peoples, as they depend upon the ocean for their livelihoods and wellbeing. A lot of people in Japan also rely on fishing for their livelihoods and wellbeing. The people, lands and waters in Pacific Island Countries have long been a target for the nuclear waste of other more geopolitically powerful nations such as the US and France since the 1940s. Burch called for rigorous scientific studies that answer questions generated by community members in the Pacific and Japan, community-led consultation, and open public debate, which will provide the foundation for making better decisions about how to handle nuclear wastewater in the future TEPCO has

options to store the wastewater on land, which could give scientists time to conduct rigorous scientific studies that look into the complex effects of discharging nuclear-contaminated waste into the ocean....

“However, TEPCO is hoping they can avoid responsibility for their nuclear waste by simply dumping the wastewater now and potentially measuring the impact later. Of course, that is a recipe for disaster because a company that could be held liable for damage would never want to conduct the rigorous scientific studies that might show such results”

Source: <https://www.globaltimes.cn/page/202303/1287392.shtml>, 16 March 2023.



Centre for Air Power Studies

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