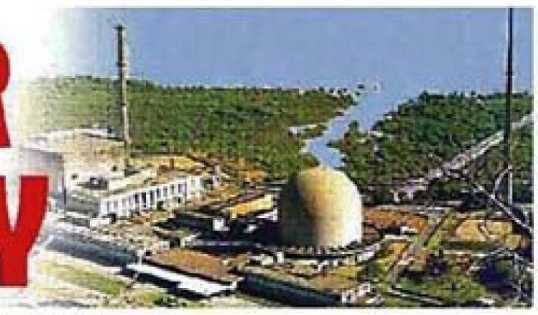
NUCLEAR SECURITY



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

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JOINT STATEMENT

Eighth and Ninth Review Meeting of the Convention on Nuclear Safety

We are grateful to the Presidency and the IAEA for hosting the combined Eighth and Ninth Review Meeting of the Convention on Nuclear Safety. We recognize the diligent efforts of meeting officers, staff, and Contracting Parties toward supporting a successful and productive Review Meeting. We acknowledge that notable progress was made in the peer review process in each Country Group, with important successes and challenges documented to further strengthen nuclear safety in advance of the next Review Meeting.

We regret that the Summary Report for the Review Meeting does not accurately reflect the important discussions that occurred regarding the significant risks to nuclear safety resulting from the Russian Federation's unlawful full–scale invasion of Ukraine, particularly the military seizure of the Zaporizhzhia Nuclear Power Plant (ZNPP) and ongoing difficult and stressful conditions under which Ukrainian personnel at the site are operating. Contracting Parties in every Country Group discussed the severe implications for nuclear safety resulting from Russia's invasion of Ukraine.

These unprecedented military actions by the Russian Federation against a sovereign state's nuclear installations continue to cause and threaten damage to the ZNPP and other nuclear facilities, endanger Ukrainian personnel at ZNPP, prevent Ukraine's regulatory oversight and control, threaten the safety of Ukraine's citizens and those in neighboring nations.

These unprecedented military actions by the Russian Federation against a sovereign state's nuclear installations continue to cause and threaten damage to the ZNPP and other nuclear facilities, endanger Ukrainian personnel at ZNPP, prevent Ukraine's regulatory oversight and control, threaten the safety of Ukraine's citizens and those in neighboring nations, and –as self–identified by Ukraine as a challenge in its National Presentation – compromise and inhibit Ukraine's ability to meet its obligations under the Convention.

Russia's hostile actions have also compromised the IAEA Director General's "seven indispensable pillars on nuclear

safety and security" as derived from IAEA safety standards and nuclear security guidance. We take this opportunity to acknowledge and commend the Ukrainian nuclear safety personnel who are working diligently to uphold Ukraine's obligations under the Convention by maintaining the safety of Ukrainian nuclear facilities to the maximum extent possible, in incredibly challenging circumstances. We continue to welcome the efforts of the IAEA to help ensure safety at Ukraine's nuclear facilities while respecting Ukrainian sovereignty, territorial integrity, and energy infrastructure.

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Source: https://www.state.gov/joint-statement-eighth-and-ninth-review-meeting-of-the-convention-on-nuclear-safety/, 31 March 2023.

OPINION – Ashish Dangwal

Moscow Trains Belarus on Iskander-M Nuclear Missiles as RuMoD Confirms Delivery to Minsk

The Russian defense minister has announced that Belarus has received the Iskander-M operational-tactical missile system (OTRK) from Russia, which can employ both conventional and nuclear missiles. Defense Minister Shoigu announced the transfer of the Iskander-M missile system to Belarus on April 4 during a conference call with the leadership of the country's armed forces.

President Lukashenko earlier confirmed that Belarusian Su-24s had been re-equipped to carry nuclear weapons. Lukashenko has frequently mentioned that Moscow has already assisted Belarus in modernizing its warplane fleet to enable it to carry nuclear weapons.

Shoigu added that training for Belarusian servicemen to use the Iskander began on April 3 at one of the Russian military's training facilities. Shoigu also disclosed that some of Minsk's military planes can now launch nuclear missiles at hostile locations. President Lukashenko earlier confirmed that Belarusian Su-24s had been re-equipped to carry nuclear weapons. Lukashenko has frequently mentioned that Moscow has already assisted Belarus in modernizing its warplane fleet to enable it to carry nuclear weapons. Shoigu also commented on NATO's increased combat readiness and heightened activities near the borders of Russia and Belarus. He warned that Finland's NATO membership could potentially escalate the ongoing Moscow-Kyiv conflict.

President Putin recently said that Moscow would complete the construction of a dedicated storage facility for tactical nuclear weapons in Belarus, which was met with strong international condemnation. According to Belarus' Foreign Ministry, hosting Russian nuclear weapons does not represent an infringement of any international non-proliferation treaties. That action was compelled by years of Western pressure.

However, on April 3, NATO Secretary-General Stoltenberg told reporters that he had not observed any movement of Russia's nuclear weapons. Stoltenberg stated that President Putin's announcement is part of a larger hazardous and irresponsible nuclear rhetoric pattern. He emphasized that Russia is attempting to utilize nuclear weapons as a means of coercion and intimidation to dissuade NATO allies and partners from supporting Ukraine's right to safeguard its own country. He accused the Russian President of "dangerous and reckless" nuclear rhetoric, which, in his opinion, was allegedly voiced even before the beginning of the conflict in Ukraine….

The Iskander-M missile system is a mobile, short-range ballistic missile system developed by Russia. It is designed to deliver conventional and nuclear warheads with high precision and has a range of up to 500 kilometers. The Iskander-M is equipped with various advanced technologies that enhance

its accuracy and lethality, including a digital inertial guidance system, a terrain comparison system, and a radar homing head. The nuclear-capable version of the Iskander-M is believed to be equipped with a low-yield nuclear warhead designed to minimize collateral damage while maximizing its destructive effect on a specific target.

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The Iskander-M's nuclear capability has raised concerns among some Western nations. The installation of the Iskander-M missile system in Belarus would also be a matter of great apprehension for Ukraine, which has been cautioning its Western allies regarding the possibility of a Russian nuclear attack.

The existence of tactical nuclear weapons in Belarus, which shares a border with Ukraine, would allow Russia to quickly and easily launch attacks on potential targets in Ukraine using their aircraft and missiles if they choose to do so. This would also extend Russia's ability to strike multiple NATO members in Eastern and Central Europe. This development coincides with Kyiv's preparations to launch a counteroffensive to take back areas occupied by Russia.

Medvedev, the deputy head of Russia's Security Council, recently issued a warning that any move by Ukraine to retake control of the Crimean Peninsula would be considered an imminent danger to Russia's sovereignty and may result in a nuclear response under the country's security doctrine.

The Russian Foreign Ministry has asserted that the US and its allies have ignored Russia's requests to withdraw US nuclear weapons from Europe. As a result, Moscow has reaffirmed its right to take any additional actions required to ensure the security of Russia and its allies. Dmitry Medvedev, the deputy head of Russia's Security Council, recently issued a warning that any move by Ukraine to retake control of the Crimean Peninsula would be considered an imminent danger to Russia's sovereignty and may result in a nuclear response under the country's security doctrine.

Medvedev stated that every day Ukraine receives weapons from Western countries, it brings the world closer to a nuclear apocalypse. Meanwhile, Ukrainian military analyst Oleh Zhdanov suggests that Putin's objective is to dissuade Ukraine's Western supporters from providing additional weapons before they launch any counteroffensive.

Source: https://eurasiantimes.com/nato-russia-conflict-moscow-trains-belarus-on-iskander-m-nuclear-missiles-as-rumod-confirms-delivery-to-minsk/, 04 April 2023.

OPINION – Artyom Shraibman

Hosting Russian Nuclear Weapons will Have Far-Reaching Consequences for Belarus

President Putin's recent announcement that Russia would station nuclear weapons in Belarus made global headlines, but in many ways, it was entirely predictable. Moscow is escalating the conflict at a time when other efforts to convince the West to stop increasing its military aid to Ukraine have failed. After all, Western leaders have no choice but to take the nuclear threat seriously. In addition, Russia is presenting the deployment not just as a decision made by both countries, but as a response to long-standing requests by Belarusian leader Lukashenko.

This is Russia's tried-and-tested way of showing respect for its ally, previously cited when dispatching Russian troops to Belarus for training exercises both last February — ahead of the invasion — and in October. It's not yet clear when Russian weapons could appear in Belarus. Putin

said only that starting in April, Belarusian pilots will receive training in piloting planes capable of carrying nuclear weapons, and that a nuclear weapons storage facility would be built in Belarus by July 1.

According to President Putin, control of the weapons will not be handed over to Belarusian troops. The lack of detail appears to confirm that the announcement's aim is to signal to Russia's adversaries — primarily the United States — that they still have time to change trajectory and agree terms with Russia to ensure that that storage facility remains empty. If nuclear weapons in Belarus were required for military purposes, Russia would hardly have announced that publicly, in advance, and with a specific timeframe. It's true that the Belarusian leader has been talking about the possible deployment of nuclear weapons in his country for almost 18 months now.

If nuclear weapons in Belarus were required for military purposes, Russia would hardly have announced that publicly, in advance, and with a specific timeframe.

Even before the war in Ukraine, in November 2021, he floated the idea as a possible response to the deployment of U.S. nuclear weapons in Poland. Lukashenko could hardly have known back then that a war would soon be underway, and that a year later Putin would want to resort to nuclear blackmail. It's more likely that Minsk was simply carrying out a traditional foreign policy exercise, offering the boldest kind of security services in expectation of potential political and economic support from Moscow.

Ordinary Belarusians are expected to be against the move: about 80% of the country's urban population oppose the deployment of nuclear weapons in their country, according to Chatham House surveys carried out last year. It would clearly strengthen Belarusian ties to Russia, as the country would essentially acquire a new Russian military base.

Judging from the context in which these threats were made, Lukashenko was also craving recognition and the respect of his peers, and sees nuclear weapons capable of reaching Vilnius, Warsaw, and Kyiv as a way to achieve that. Yet the chance to intimidate the Lithuanians and Poles will also translate into greater attention to Belarus from NATO. Belarusian nuclear weapons storage facilities, missile deployment sites, and airfields will become a primary target should the Russian-Ukrainian conflict escalate more globally.

Overall, it's hard to say whether the idea has more advantages or disadvantages for Lukashenko himself. Ordinary Belarusians are expected to be against the move: about 80% of the country's urban population oppose the deployment of nuclear weapons in their country, according to Chatham House surveys carried out last year. It would clearly strengthen Belarusian ties to Russia, as the country would essentially acquire a new Russian military base. Ultimately, however, it changes little between Minsk and Moscow, as both regimes have long since passed the point at which Putin might allow an uncontrolled transfer of power in Belarus.

In this context, deploying nuclear weapons gives the Kremlin another reason to leave the Belarusian military stronghold under Lukashenko's control — but there were already plenty of reasons to do that. Minsk will naturally demand and likely receive some kind of economic aid in return. The Ukraine war would have run a very different course without the cooperation of Belarus, and now Lukashenko is also helping Moscow with its global nuclear blackmail. It would be ungracious of the Kremlin to let such loyalty go unrewarded.

For six months, Lukashenko has avoided becoming more deeply embroiled in the conflict. There has been no shelling of Ukrainian territory from Belarus since October. But the deployment of nuclear weapons, if and when it happens, will be a major new step in Belarus's involvement. It will become harder for those in Europe who have advocated applying differing sanctions to Minsk and Moscow to defend their position, while hawks such as Poland and the Baltic states will have powerful

new ammunition to bolster their long-held argument that Lukashenko should be treated as part of the Russian regime.

Neither side is likely to take into account that it's doubtful whether anyone actually asked Lukashenko's opinion on the issue. He has threatened too many times in the past to ask Putin to return the nuclear weapons withdrawn from Belarus in the mid-1990s. Brussels is already threatening Minsk with new sanctions if nuclear weapons do appear on Belarusian territory. But the most painful sanctions have long been in place, so threats from the West are far less dangerous for Lukashenko than Russia's inevitable ire if he suddenly changes his mind. Another consequence of the announcement is that lobbyists in the UN and from the Global South will face far greater difficulties now convincing the EU hardliners to unblock the export of Belarusian potassium fertilizer through the Lithuanian port of Klaipeda. The EU has for several months been discussing the possibility as a way to alleviate the global food crisis, but loosening sanctions against Minsk at this point would look absurd.

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Finally, as long as Belarus remains no more than a corridor for Russian ground troops, their training range, and a base for Russian jets, there's a chance that the country's complicity in this war could stay under the radar of peace negotiators. But if Belarus acquires a full-fledged permanent Russian nuclear base, the Belarusian question will likely feature on any postwar settlement agenda. Even if negotiations on a new European security architecture take place when Putin and Lukashenko are no longer in power, it will be hard to overlook the presence of nuclear weapons so close to Kyiv and three NATO member capitals. Now the West and Ukraine are more likely to demand the demilitarization of Belarus to at least prewar levels. The fate of Belarus as a state is becoming increasingly tied to the outcome of a future peace settlement. It will be hard for any subsequent government in Minsk to distance itself from Russia economically and politically of its own accord. But once Belarus starts hosting Russian nuclear weapons, it will be downright impossible.

But if Belarus acquires a full-fledged permanent Russian nuclear base, the Belarusian question will likely feature on any postwar settlement agenda. Even if negotiations on a new European security architecture take place when Putin and Lukashenko are no longer in power, it will be hard to overlook the presence of nuclear weapons so close to Kyiv and three NATO member capitals. Now the West and Ukraine are more likely to demand the demilitarization of Belarus to at least prewar levels.

Source: https://www. themoscowtimes.com/2023/04/02/hosting-russian-nuclear-weapons-will-have-far-reaching-consequences-for-belarus-a80659, 02 April 2023.

OPINION – Jon Jackson

Russian Ally Testing Troops as Putin Prepares Nuclear Weapons Move

Belarus has reportedly started checking the combat readiness of its armed forces following the recent announcement by President Putin that Moscow will place nuclear weapons inside Belarus. Putin told Russian state television on March 25 that he will station tactical nuclear weapons in Belarus, though he did not specify when the action would occur. Putin said the move does not violate any of Russia's nuclear non-proliferation commitments. Putin also said President Lukashenko, who has long been a staunch ally of Russia, had requested the weapons' deployment. On April 2, the Russian ambassador to Belarus, Boris Gryzlov, told Belarusian state television that the weapons would be deployed close to Belarus' borders with NATO neighbors.

The March 28 announcement about the testing

of the country's armed forces' combat readiness came from Belarus' defense ministry and was said to have been ordered directly from Lukashenko. "Today, on behalf of the Head of State, the combat readiness check of the armed forces of the Republic of Belarus has begun. The measures are complex in nature and will allow to determine the ability of commanders to manage subordinate military units that are brought to the highest degree of combat readiness, as well as the readiness of military units to perform tasks for their intended purpose in a timely manner," the defense ministry's statement read, according to a translation by the Russian state-run media outlet Sputnik.

During his March 25 comments to state broadcaster Russia 1, Putin said Moscow will be in control over the weapons put in Belarus, and he compared the move to the United States stationing nuclear weapons in other countries. "We are not handing over [nuclear weapons]. And the U.S. does not hand [nuclear weapons] over to its allies. We're basically doing the same thing they've been doing for a decade," Putin said, according to a translation by Reuters. "They have allies in certain countries and they train…their crews. We are going to do the same thing."

Putin's announcement as nuclear saber-rattling but said NATO would be watching the situation. "The announcement by President Putin is part of a pattern of dangerous reckless nuclear rhetoric, where Russia, President Putin tries to use nuclear weapons as a way to prevent us from supporting Ukraine, intimidation, coercion to stop NATO Allies and partners for supporting Ukraine in their right to defend their own country," Stoltenberg said.

Putin told Russia 1 that an Iskander short-range missile system, which can be fitted with nuclear warheads, had already been transferred to Belarus. He also said Moscow has aided Belarus in converting 10 aircraft to allow them to carry tactical nuclear weapons…. When asked by reporters on March 27 about the move, NATO Secretary-General Jens Stoltenberg downplayed Putin's announcement as nuclear saber-rattling but said NATO would be watching the situation. "The announcement by President Putin is part of a pattern of dangerous reckless nuclear rhetoric, where Russia, President Putin tries to use nuclear weapons as a way to prevent us from supporting Ukraine, intimidation, coercion to stop NATO Allies and partners for supporting Ukraine in their right to defend their own country," Stoltenberg said.

He added, "But so far, we haven't seen any changes in their nuclear posture that requires any change in our nuclear posture. We remain a nuclear Alliance, we deter and defend all Allies and of course, we continue to monitor what Russia does also when it comes to any potential deployment of nuclear weapons in Belarus." But Geopolitical Strategist Alp Sevimlisoy told Newsweek that NATO should formulate more of a response to the planned actions by Putin in Belarus.

"We, as NATO, must take immediate action to counter the provocation carried out by the Russian Federation which threaten our way of life with regard to the deployment of tactical nuclear weapons beside our borders as per the transatlantic alliance that we are part of," Sevimlisoy, who is a fellow at the Atlantic Council think tank and a CEO of an Istanbul-based private asset management corporation, said.

"We must immediately respond by partnering with the Turkish Armed Forces in order to place Hypersonic missiles at [Turkey's] Incirlik Air Base, where our existing defensive tactical nuclear capabilities are held for the protection of all member states and for the national security of the Turkish nation," Sevimlisoy said.

Source: https://www.newsweek.com/russian-ally-testing-troops-putin-prepares-nuclear-weapons-move-1792255, 03 April 2023.

NUCLEAR STRATEGY

ISRAEL

Ex-PM Ehud Barak Confirms Israel has Nuclear Weapons: Why it Matters

Former Prime Minister Ehud Barak broke Israel's policy of ambiguity and tweeted on April 4 by stating his confirmation that Israel possesses nuclear weapons. While commenting on the fallout from the governing coalition's judicial

reform initiative, Barak tweeted: "It sounds weird to us. But in Israelis' conversations with political parties in the West, their deep concern emerges about the possibility that, if the coup d'état in Israel succeeds, a messianic dictatorship will be established in the heart of the Middle East, possessing nuclear weapons, and fanatically wishing for a confrontation with Islam centered on the Temple Mount. In their eyes – it's really scary. not going to happen. Happy holiday"

Israel has maintained a strict policy of never confirming or denying it possesses nuclear weapons. Nevertheless, it has been widely believed that Israel possesses them, with foreign reports estimating the nuclear arsenal's size from dozens to hundreds of bombs. Barak, a former Defense Minister and Israel Defense Forces Chief of Staff, argued in a September 2021 op-ed that Israel should review its policy of nuclear ambiguity, suggesting disclosure could be a better deterrent against Iran's nuclear program.

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Proponents of ambiguity say it protects Israel from being forced to sign the Non-Proliferation Treaty or possibly facing international sanctions. Signing the NPT would require Israel to open its nuclear facilities to international inspection. Meanwhile, the US reportedly floated a proposal with Israel and other allies in February to resume nuclear talks with Iran in which Tehran would not enrich uranium above 60 percent purity in exchange for sanctions relief. The White House has neither confirmed nor denied those reports.

The IAEA reported in March that Iran has enriched uranium to 83.7 percent purity, far higher than the 3.67% necessary for a civilian nuclear program. Nuclear weapons require uranium enriched to 90% purity. It is widely believed that Iran could finish enriching enough uranium to produce an atomic bomb in about four weeks. ...

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Source: https://www.israeltoday.co.il/read/ex-pm-ehud-barak-confirms-israel-has-nuclear-weapons-why-it-matters/, 09 April 2023.

NORTH KOREA

N Korea Says it Tested another 'Underwater Nuclear Attack Drone'

North Korea claimed on April 8 that it had tested another underwater nuclear attack drone, in its latest response to South Korean and United States military drills, though analysts have questioned whether Pyongyang has such a weapon. In recent weeks, North Korea has tested what state media have described as an underwater nuclear-capable drone, and also carried out the launch of an intercontinental ballistic missile. "A national defense science research institute in the DPRK carried out a test of underwater strategic weapon system from April 4 to 7," the official Korean Central News Agency (KCNA) said.

"The underwater nuclear attack drone 'Haeil-2'... cruised 1,000 km of simulated underwater distance ... for 71 hours and 6 minutes." KCNA said. KCNA added that "the test warhead accurately detonated underwater. The test perfectly proved the reliability of the underwater strategic weapon system and its fatal attack ability." North Korea has claimed to have conducted three tests of underwater drones in less than three weeks so far. On March 23, it claimed to have conducted the first test of the Haeil, which means tsunami in Korean, able to unleash a "radioactive tsunami" as it blamed US-South Korea exercises for a deteriorating regional security

situation. Five days later it said it had carried out a second test.

In response South Korean Defense Minister Lee Jong-sup told MPs, that Seoul was "capable of monitoring and detecting such drones infiltrating underwater". Satellite imagery has also indicated a high level of activity at North Korea's main nuclear complex after leader Kim Jong Un ordered the production of weapons-grade nuclear material be ramped up.

...But the North's claims about the tests should not be "easily dismissed for being exaggerated", Choi Gi-il, professor of military studies at Sangji University, told AFP. "While the North could have exaggerated the degree of success to some extent, they appear to show Pyongyang's underlying confidence in this technology, some of which could have been transferred from Russia." Choi said. Russia and North Korea have not officially commented on the transfer of the underwater drone technology, Choi added.

Source: https://japantoday.com/category/world/n.-korea-says-tested-another-%27underwater-nuclear-attack-drone%27, 08 April 2023.

RUSSIA–UKRAINE

Bill Clinton: My Nuke Deal to Blame for Russia's Invasion of Ukraine

Former President Clinton has said he feels a "personal stake" in Ukraine's war with Russia because of his role in persuading Kyiv to surrender nuclear weapons in the aftermath of the Cold War. "I feel a personal stake because I got them [Ukraine] to agree to give up their nuclear weapons," Clinton told Irish broadcaster RTÉ. "None of them believe that Russia would have pulled this stunt if Ukraine still had their weapons," he said.

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Ukraine retained a stockpile of nuclear weapons after the Soviet Union collapsed. In 1994, Ukraine gave up these nuclear weapons, although Kyiv did not have definitive control over Soviet nuclear weapons before signing up for non-proliferation.

Some Ukrainians have expressed the belief that Moscow would not have ordered its troops over the border into the country in February 2022 had Ukraine held onto these weapons. Ukrainian MP Oleksiy Goncharenko previously told Fox News as full-scale war broke out that "Ukraine is the only nation in human history which gave up the nuclear arsenal, the third biggest in the world in 1994." Kyiv did so "with guarantees of the U.S., the U.K., and the Russian Federation," Goncharenko added. "Where are these guarantees? Now we are bombed and killed."

However, some experts have disputed whether nuclear weapons remaining in Ukraine would have diverted the course of the current war. Clara Guest, a research assistant in proliferation finance at King's College London, U.K. wrote in March 2022 that "Ukraine would never have been able to maintain its nuclear weapons and facilities or manufacture and produce new components" given the lack of funds for the newly-independent country.

The Trilateral Statement, as it was known, was signed by Clinton, then-Russian leader Boris Yeltsin and Ukrainian President Leonid Kravchuk in January 1994. Russia, the U.S., and the United Kingdom then offered Ukraine a series of security assurances in exchange for eliminating nuclear weapons in the Budapest Memorandum later that year. "I knew that President Putin did not support the agreement President Yeltsin made never to interfere with Ukraine's territorial boundaries—an agreement he made because he wanted Ukraine to give up their nuclear weapons," Clinton said.

Kyiv was "afraid to give them up," he said, because of a belief that a nuclear stockpile was the "only

thing" to offer protection from "an expansionist Russia." "When it became convenient to him, President Putin broke it and first took Crimea," Clinton said. "And I feel terrible about it because Ukraine is a very important country."... Nuclear weapons have played a prominent role in discussions around the Ukraine war. Since the early days of the invasion, Russia has alluded to the potential use of its nuclear arsenal as Kyiv's NATO backers supported Ukraine's resistance efforts....

Source: https://www.newsweek.com/bill-clinton-ukraine-war-russia-nuclear-weapons-deal-vladimir-putin-1792682, 05 April 2023.

RUSSIA–BELARUS

Does Putin have a Case for Deploying Tactical Nukes in Belarus?

President Putin on April 1 announced his decision to station tactical nuclear weapons in Belarus.... Expectedly, the declaration triggered a storm of protests, led by NATO, including smearing Russia with the tag of "nuclear blackmail". NATO called Putin's assertion "dangerous and irresponsible". The US adopted a wait-and-see approach. Washington will "monitor the implications" of Putin's threat, National Security Council spokesperson Adrienne Watson said. "We have not seen any reason to adjust our own strategic nuclear posture nor any indications Russia is preparing to use a nuclear weapon," Watson said in a statement.

An aggressive NATO predates the war. The grouping had positioned nuclear weapons in several European countries including Kleine Brogel (Belgium), Büchel (Germany), Aviano and Ghedi Torre (Italy), Volkel (The Netherlands) and Incirlik (Turkey). On the contrary Russians had not placed nukes abroad and Belarus would be the first country where they will do so. Cleary their move is reactive and not proactive" says Bala Venkatesh Varma, India's former ambassador to Russia.

Putin's move comes at a time when tensions between Moscow and Washington are on an escalatory path over Ukraine. Earlier this month Russian fighter jets downed a US drone—an event that opened a possible pathway to a direct confrontation between Moscow and Washington. President Xi also visited Moscow—a move that mocked at western attempts to isolate Russia with sanctions....

Showing the mirror to NATO, Putin spotlighted that Russia's move was meant not to provoke by countering US deployments of nuclear weapons in different European countries. "We are doing what they have been doing for decades, stationing them in certain allied countries, preparing the launch platforms and training their crews," Putin said in a state media interview on April 1. "We are going to do the same thing."

"An aggressive NATO predates the war. The grouping had positioned nuclear weapons in several European countries including Kleine Brogel (Belgium), Büchel (Germany), Aviano and Ghedi Torre (Italy), Volkel (The Netherlands) and Incirlik (Turkey). On the contrary Russians had not placed nukes abroad and Belarus would be the first country where they will do so. Cleary their move is reactive and not proactive" says Bala Venkatesh Varma, India's former ambassador to Russia in a conversation with India Narrative.

On April 1 Putin said Russia will complete the construction of a storage facility for the weapons by July 1. He added that stationing nuclear weapons in Belarus did not violate international non-proliferation agreements, as Moscow would still control the weapons. Varma, a nuclear disarmament expert added that after the INF treaty expired in... Russia offered an extension of the treaty that bans deployment of intermediate range missiles, confined only to Europe. But the US spurned the offer, he observed.

Source: https://www.khmertimeskh.com/501266673/does-putin-have-a-case-for-deploying-tactical-nukes-in-belarus/, 03 April 2023.

NUCLEAR ENERGY

GENERAL

Greta Thunberg has Embraced Nuclear Power: Will the Greens Follow?

The Russian invasion of Ukraine forced a much overdue re-examination of Europe's energy grand vision. Without the ability to access cheap Russian natural gas, Europe must reevaluate tactics and priorities. The strategy of relying on Russian hydrocarbons for a relatively clean baseload while slowly building up renewable generation capacity has been rendered untenable for the foreseeable future.

With a disrupted long-term plan, the green movement has had to examine its own priorities and assumptions. Chief amongst these is the fanatical opposition from many environmentalists towards nuclear energy. This view is irrational: civilian nuclear energy is safe and cheap and generates zero emissions. Green icon Greta Thunberg seems to be taking a pro-nuclear stance.

With a disrupted long-term plan, the green movement has had to examine its own priorities and assumptions. Chief amongst these is the fanatical opposition from many environmentalists towards nuclear energy. This view is irrational: civilian nuclear energy is safe and cheap and generates zero emissions. Green icon Greta Thunberg seems to be taking a pro-nuclear stance. The Swedish climate activist once decried nuclear energy as being "extremely dangerous, expensive, and time-consuming."

Her views seem to have changed in tandem with recent trends in public opinion as she recently argued that Germany shutting down its nuclear plants was a "mistake." Thunberg, alongside other climate activists, emphasized that the alternative to nuclear would be coal, a most polluting energy source…. The irony of nuclear power debates is that the science behind it is settled, while public debate largely ignores the data.

The deaths from nuclear power (deaths per terawatt hour) are far eclipsed by its competitors with only 0.03 deaths per terawatt hour, compared to 32.72 for Brown Coal. Over the past 50 years, nuclear energy reduced CO2 emissions by 60 gigatons- nearly two years' worth of global energy emissions. Concerns about cancer have been disproved, whereas repeated studies have shown that the impact of fossil fuels on the environment results in more fatalities and public health damage than nuclear accidents.

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Not long before Thunberg's statement, Germany made a U-turn deciding to keep two of its nuclear power plants online, after originally promising to scrap them entirely. The decision to keep these nuclear plants running marked the first departure from a Green Party, born out of the anti-nuclear two-decade policy to abandon nuclear energy and a strong proponent of Germany's nuclear phaseout, announced that it would support a limited extension of the country's nuclear plants.

The economic war mounted by Russia's invasion of Ukraine has forced even the staunchest anti-nuclear elements to recognize nuclear energy's substance. American progressives have also begun to warm up to the idea of nuclear as a green energy source. Democratic Socialist Congresswoman Alexandria Ocasio-Cortez who initially argued for a transition from nuclear to renewable sources, now seems to adopt a more pragmatic approach.

Following a congressional trip to Japan, which included a visit to Fukushima, the Congresswoman echoed the fundamentals of Thunberg's stance, noting that reducing nuclear power would result

in the increased utilization of dirty hydrocarbons.... Across the world, a nuclear renaissance is already underway: uranium production is increasing, as many producers forecast a period of significant growth in nuclear capacities and are optimistic about emerging small modular reactor technology....

Regardless of the increased current or future use of nuclear energy, opposition remains. After the European Union included nuclear energy in the list of green investments, Austria, historically opposed to nuclear energy, challenged that policy. Other European countries, including Luxembourg, Denmark, and Portugal have also joined the "anti-nuclear alliance." Though a majority of the American public supports developing the nuclear sector, it does so only by a razor-slim margin disconnected from partisan affiliation.

Regardless of the increased current or future use of nuclear energy, opposition remains. After the European Union included nuclear energy in the list of green investments, Austria, historically opposed to nuclear energy, challenged that policy. Other European countries, including Luxembourg, Denmark, and Portugal have also joined the "anti-nuclear alliance.

These changing views on nuclear energy are rational. Many realize nuclear energy is a good alternative to fossil fuels and is needed while the West is decoupling from Russian energy without abandoning the transition to clean energy. To facilitate acceptance of nuclear energy policymakers and activists need to address issues related to waste disposal, plant maintenance, and reactor safety and security, particularly of those located in war zones. No energy industry is perfect, including nuclear power. Nevertheless, it is one of the cleanest and most efficient sources of energy we have. Opposing nuclear power is allowing perfection to become the enemy of the good.

Source: https://www.forbes.com/sites/arielcohen/2023/04/03/greta-thunberg-has-embraced-nuclear-power-will-the-greens-follow/?sh=9125ccd1e9ad, 03 April 2023.

G7 Likely to Back Nuclear Power Amid Energy Security Concerns

Climate, energy and environment ministers from the Group of Seven advanced economies are considering stressing the importance of nuclear power for energy security in a joint statement to be issued after a meeting later this month, according to a draft of the statement. The statement, seen April 7, is likely to note that G7 countries welcome Japan's plan to release treated water from the crippled Fukushima No. 1 nuclear power plant into the ocean in a transparent way and in close coordination with the IAEA, according to the draft. The G7 climate, energy and environment ministers are scheduled to meet in Sapporo on April 15-16.

Parliament is currently deliberating legislation that would extend the life of nuclear plants beyond 60 years as the government aims to ensure stable electricity supply and promote decarbonization at the same time. Britain and France are accelerating construction of new nuclear plants, while the development of a small modular reactor is underway in the United States.

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Germany, which is expected to complete the shutdown of all nuclear plants in the country this month, opposes highlighting the importance of nuclear power. In the face of German opposition, some are calling for the statement to say that nuclear power is important to countries opting to use the energy.

The Japanese government plans to start the release of water from the Fukushima nuclear plant this spring or summer. The plan has drawn opposition from the local fishery industry and concern from some countries, including China and South Korea. The draft also spelled out plans for countries opting to use nuclear power to cooperate in developing and building small modular reactors and next-generation reactors. Plans for cooperation in building nuclear industry supply chains will also be included.

Source: https://www.japantimes.co.jp/news/2023/04/08/national/politics-diplomacy/g7-nuclear-energy-promotion/, 08 April 2023.

INDIA

Can India Revive its Quest for Nuclear Suppliers Group Membership?

Prime Minister Modi's long pursuit of membership for India in the NSG seems to have stagnated, incrementally losing momentum after a lack of forward progress — thanks to China — since the NSG Annual Plenaries in 2016 and 2018. In 2022, India's EAM Jaishankar declared that India looked forward to join the NSG and overcoming "political impediments that are against global interest." Despite Modi's intense lobbying, India still remains outside the elite nuclear club, unable to extract the same benefits as its 48 participating states.

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New Delhi desperately needs to revive its membership efforts. Joining the NSG with full membership remains a key priority for the Modi-led BJP government for two principal reasons. First, it would mark a major foreign policy achievement for the BJP and Modi, completing India's accession to all the key multilateral export control arrangements, after already securing membership in the MTCR (2016), Wassenaar Arrangement (2017) and Australia Group (2018) — all under Modi's premiership.

Second, impediments to India's NSG membership also provide political leverage to India's main opposition party in the Parliament, the Indian National Congress (INC), which was largely responsible for championing the India-U.S. civil nuclear deal and securing India's NSG waiver during the first Manmohan Singh-led government (2004-2009) ….

While the NSG waiver unequivocally helped India to successfully negotiate more than a dozen civil nuclear cooperation agreements, Washington's unconditional support and India's rising ambitions over political status had also strengthened demands in New Delhi's strategic circles to secure full NSG membership. Simultaneously, the unique Indian waiver has also greatly diminished any possible scenarios for India to ever accede to the NPT. After India's membership ambitions were stalled at successive NSG plenary meetings, its renewed efforts to secure membership have tried to lay more emphasis on joining the NSG to fulfil India's long-term low-emissions growth strategy and support its climate transition goals.

Simultaneously, the unique Indian waiver has also greatly diminished any possible scenarios for India to ever accede to the NPT. After India's membership ambitions were stalled at successive NSG plenary meetings, its renewed efforts to secure membership have tried to lay more emphasis on joining the NSG to fulfil India's long-term low-emissions growth strategy and support its climate transition goals.

Equally, there is less talk and little emphasis on the prestige factor and recognition of India's nuclear status. India's G-20 presidency — even though overshadowed by the Russia-Ukraine war and China-U.S. competition — is an opportunity

for the Indian leadership, which at least merits the issue of raising its pending NSG membership in a bid to revive multilateral arrangements...

India's diplomatic and political circles further remain convinced that NSG membership is still possible and will improve India's nuclear energy program and upgrade its nuclear power infrastructure to further enhance its nuclear exporting capacity. There remains the challenge of balancing international norms with geopolitical and geoeconomic considerations. In this sense, the NSG's consensus-based voting procedure, which requires participating states to show unanimity while approving decisions and admitting new members, presents a fundamental challenge to India's membership.

The principal obstruction to India's bid comes from China, which in turn points to Pakistan's own pending NSG membership. India's membership bid is also opposed by three other states — Ireland, New Zealand, and Austria — which are firm advocates of nuclear disarmament and parties to the Treaty on the Prohibition of Nuclear Weapons (TPNW).

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However, similar to Australia a decade earlier, New Zealand and the remaining states are now facing intense pressure to lift their opposition to India's bid. Opposition from other states provides political cover for Beijing to strengthen its position against India's bid based on shifting geopolitical landscape in the Indo-Pacific. However, the reality also seems to reflect that New Delhi has been unsuccessful in persuading NSG members that its membership will yield dividends to the non-proliferation regime.

Many participating states are likely to still underscore the significant difference between lifting trade sanctions and allowing India to participate in NSG decision-making procedures. Former U.S. Assistant Secretary of State for South and Central Asia Nisha Biswal, who served in the Obama administration, said in a 2017 interview that "clearly there is one outlier that needs to be addressed and that is China."

When President Xi hosted Modi for an informal summit in Wuhan in 2018, New Delhi had a range of concerns to be discussed, including its pending NSG membership application. China's position remained unchanged, with it justifying "exempting India as unfair especially to other non-NPT states who want to join the NSG." Beijing's firm opposition to India's NSG membership further reflects two factors.

First, Beijing, actively involved in the development of Pakistan's nuclear capabilities, disapproves of the increasing spotlight given to New Delhi's membership bid and the discrimination against Islamabad's. Second, it realizes that Washington's successful lobbying and India's rising clout has greatly reduced the transaction costs for its bid, and China is keen to retain question marks over India's complicated insider/outsider status in the non-proliferation regime by denying it NSG membership.

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China also previously had serious concerns over the India-U.S. civil nuclear deal and believes that

India's enhanced civil nuclear capabilities will aid its nuclear weapons modernization due to constraints in verifying diversion of dual use items. Although China does not consider India a security threat and views relations with its neighbor through the prism of China-U.S. strategic competition, its perceptions about India as a nuclear weapons power and the intensifying Sino-Indian border dispute render significant costs for India's NSG bid….India's G-20 presidency can be an opening and should be leveraged by policymakers to restart NSG membership talks by constructing pragmatic pathways to further its bid, which may need to involve some level of bargain and cooperation with Beijing.

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Equally important will be the role of Brazil, which currently presides over the NSG and will assume the G-20 presidency later in 2023 from India. As South-South and BRICS partners, Brazil under Lula da Silva's presidency will present a new opportunity for Modi's government to start on a fresh note and convey its interests for securing membership, which may rekindle India's bid during Brazil's NSG presidency.

Source: https://thediplomat.com/2023/04/can-india-revive-its-quest-for-nuclear-suppliers-group-membership/, 01 April 2023.

India Eyes Major Expansion of Nuclear Power

India's government is pushing for construction of more nuclear power plants as the country looks to increase its supply of cleaner energy. Officials have made some ambitious pronouncements, calling for as many as 20 new nuclear power facilities to be brought online over the next decade, more than doubling the number of operating nuclear power plants in the country. Officials in February announced that Haryana state in northern India will be home to that of region's first nuclear plant, as a 1,400-MW facility already is under construction near Gorakhpur village, about 90 miles northwest of New Delhi. That plant will feature two 700-MW PHWR of Indian design.

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The U.S. and India in 2019 signed a deal in which the U.S. pledged to support construction of at least six nuclear power plants in India, and the two countries in February revisited previous agreements from as long ago as 2008 that could facilitate U.S. backing of India's nuclear power program.

Officials in India also have signed civil nuclear cooperation agreements with another dozen countries, including Russia, Canada, and France, that would support the deployment of additional reactors. The NPCIL has received government backing to build a series of 700-MW PHWR reactors as part of the country's domestic nuclear power program. Westinghouse and the NPCI in 2016 had a broad agreement for the U.S. company to build as many as six reactors in India, but the deal collapsed after Westinghouse declared bankruptcy in 2017.

Jitendra Singh, India's Union Minister of State for Atomic Energy, said the agency is working with Prime Minister Modi's government on the installation of nuclear power plants in new areas. Most of India's operating reactors are located in the southern and western parts of the country.

Singh earlier this year said the government is seeking investment from companies in the public

sector to help advance India's nuclear power and other energy goals. Modi's government has talked about a goal of having 500 GW of energy from non-fossil fuel sources by 2030, which would require a rapid ramp-up of nuclear and renewable energy generation capacity. Singh said Modi's government already has given approval for construction of at least 10 new nuclear reactors.

Fast additions of nuclear power likely would require changes to India's historical construction timelines of new reactors. An analysis of data from the IAEA released earlier this year shows the median construction time for nuclear plants in India historically has been just more than 14 years, from the start of construction until connection to the power grid. Officials have said the country must improve that mark to achieve its nuclear power goals, citing the same analysis that shows China has been building and commissioning nuclear reactors in fewer than six years. "India is looking to reduce its fossil fuels by half by 2032; building nuclear plants is seen as a central part of that strategy," said Irina Tsukerman, a geopolitical analyst and president of Scarab Rising, a Connecticut-based business advisory group.

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"From a safety perspective, it is not a significant risk given that India is already a nuclear power. Civilian plants would not necessarily introduce any greater risk; the key would be cooperation with reputable companies and Western states toward building safe and well-maintained facilities." ... "The Indian government is indeed pushing nuclear particularly strongly and the current plans may lead to tripling the nuclear power generation capacity in the next 10 years," said François Le Scornet, president and Cleantech & Climate Tech senior consultant at Carbonexit Consulting in France....

"Foreign companies like Areva and Westinghouse have had in-depth discussion with Indian authorities about new projects that focus on larger reactor models, with EPR [evolutionary pressurized water reactor] models at Jaitapur and the [Westinghouse] AP1000 model at Kovvada and/or Chhaya-Mithi Virdi, respectively. Russian AES-2006 and VVER-1200 models are also considered for other sites as well," said Le Scornet.

Source: https://www.powermag.com/india-eyes-major-expansion-of-nuclear-power/, 03 April 2023.

NAMIBIA

Combined Water-Saving and Nuclear Techniques Help Improve Farmers' Productivity and Income in Namibia

Namibia is one of the driest countries in Africa. It is home to the world's oldest desert, the Namib, as well as the Kalahari Desert, whose name derives from the Tswana word for "great thirst". Approximately 92 per cent of the country is defined as very arid, arid or semi-arid, and its rainfalls are rare and erratic.

In the last decade, Namibia's government declared national emergencies three times due to severe droughts that caused substantial harm to the country's agriculture and economy. The most recent drought in 2019 – the worst for the country in 90 years – saw agricultural production hit an all-time low, leading to serious food shortages.

With support from the IAEA and the Food and Agriculture Organization of the UN (FAO), farmers in the northern regions of Kavango East, Kavango West, Omusati, Oshikoto and Tsumeb are now using a combination of nuclear techniques and a water-saving irrigation technology, known as small-scale drip irrigation, for watering their fields.

Based on cosmic ray neutron sensors, which provide real-time data on soil moisture, it has

allowed farmers to deliver small but precise amounts of water directly to the plants. Drip irrigation, which is made possible with the help of nuclear and isotopic techniques that can measure moisture levels in both the soil and the plants, enables farmers to work out exactly how much water and nutrients to use and when.

It allows water to be fed to the plants through a network of pipes or narrow tubes that deliver water directly to either the base or the root. The process helps to reduce water use. Implemented as part of an IAEA technical cooperation project, which started in 2020, this drip irrigation system has helped increase irrigation water use efficiency by over 80 per cent compared to rainfed agriculture, and has improved yields by up to 70 per cent in the farmers' fields that were part of the project.

Most smallholder farmers in Namibia rely solely on rainfall for crop production. However, scarce and unpredictable rains, as well as poor soil fertility, mean yields of the country's staple food crops remain low. At any stage of plant growth — be it after sowing or during flowering — drought adversely affects its development, resulting in low productivity and weak harvest. ...

Gaeseb's farm used to rely on a diesel water pump, but the high cost limited his agricultural output. He and other farmers participated in demonstration trials coordinated by the IAEA and FAO. They received small-scale, solar-powered drip irrigation equipment capable of filling a 10,000-litre water tank within an hour. Gaeseb explained that his production has quadrupled thanks to this technology.

Andreas Naoseb, a farmer from Oshikoto who also took part in the project, said that before the drip irrigation system "our 10-hectare land had been lying idle without being utilized for crop or animal production." He explained that the new irrigation equipment has breathed new life into the farm, uniting the family around the business and providing income throughout the year.

Growing More, Watering Less: The IAEA and FAO are working with scientists in Namibia to advance the application of drip irrigation to protect crops amid severe droughts. "Drip irrigation provides the minimum amount of water needed for crops to flourish and thrive, to mitigate the effects of unprecedented droughts at any crop growth stages, helping local farmers substantially increase yields with less water and prevent water loss due to evaporation," said Joseph Adu-Gyamfi, Integrated Soil Fertility Management Specialist at the Joint FAO/IAEA Centre of Nuclear Techniques in Food and Agriculture.

Namibia's government is developing programmes to enhance food security and strengthen food production. The plan includes increasing yields of major crops, such as maize, sorghum and cowpea by 25 to 50 per cent. As part of these efforts, the government is exploring the possibility of introducing more small-scale drip irrigation systems to increase the efficiency of agricultural output, protect water resources and expand the cultivation of other high-value crops, such as onions, tomatoes, cabbages and groundnuts, including off-season.

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Source: https://www.iaea.org/newscenter/news/combined-water-saving-and-nuclear-techniques-help-improve-farmers-productivity-and-income-in-namibia, 06 April 2023.

USA

A New Era for Nuclear Power in America?

...The U.S. has consistently been the world's leading producer of nuclear energy, with a 29% global share in 2021. Nuclear energy is

responsible for 8% of all U.S. energy consumption. However, after rapid growth from 1965 to 2000, nuclear power growth in the U.S. has been stalled for the past 20 years. ...The Watts Bar Unit 1 nuclear reactor came online in 1996 in Tennessee, and the Watts Bar Unit 2 nuclear reactor came online in 2016.

That should change this year, as Georgia Power, a subsidiary of Atlanta-based Southern Co. prepares to start up two new reactors. The reactors at Plant Vogtle, southeast of Augusta, Georgia, were approved by the Georgia Public Service Commission in 2009. The reactors are two Westinghouse AP1000 nuclear units with a capacity of about 1,117 MW each.

The first reactor was supposed to start generating power in 2016, but the project has suffered years of delays and billions in cost overruns. But, last month Vogtle Unit 3 began to split atoms, as startup testing got underway. Commercial operation is expected to commence in May or June. Unit 4 could start up as early as November of this year. So, nuclear power should finally see a boost in the U.S. this year.

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According to the U.S. Nuclear Regulatory Commission (NRC), a number of new reactors were approved in the U.S. over the past decade or so. But most of those were cancelled by the applicants in the wake of the Fukushima disaster. Beyond Vogtle, there are no more nuclear reactors under construction in the U.S. Given the significant delays and cost overruns seen in the Vogtle project, it may be a long time before we see another conventional nuclear reactor built in the U.S.

The next generation will likely see the rise of SMRs. SMRs are designed to be more flexible than traditional nuclear reactors.... In January 2023, GE Hitachi Nuclear Energy (GEH), Ontario Power Generation (OPG), SNC-Lavalin and Aecon announced a contract for the deployment of a BWRX-300 SMR at OPG's Darlington New Nuclear Project site. This is the first commercial contract for a grid-scale SMR in North America, and it represents a significant step towards the adoption of SMRs.

Source: https://oilprice.com/Alternative-Energy/Nuclear-Power/A-New-Era-For-Nuclear-Power-In-America.html, 06 April 2023.

Vogtle 3 & 4 Nuclear Units Take Significant Steps Toward Operations

Georgia Power announced it has achieved another important milestone for the new nuclear units under construction at its Vogtle 3 & 4 nuclear expansion project near Waynesboro, Ga. The generator at Vogtle Unit 3 has generated electricity for the first time, and the unit has successfully synchronized and connected to the electric grid. Meanwhile, at Vogtle Unit 4, nuclear operators began hot functional testing last month. Both achievements represent significant steps toward operations.

Georgia Power announced it has achieved another important milestone for the new nuclear units under construction at its Vogtle 3 & 4 nuclear expansion project near Waynesboro, Ga. The generator at Vogtle Unit 3 has generated electricity for the first time, and the unit has successfully synchronized and connected to the electric grid. Meanwhile, at Vogtle Unit 4, nuclear operators began hot functional testing last month. Both achievements represent significant steps toward operations.

"What an incredibly inspiring time to join Georgia Power as we celebrate this milestone that marks the first day of generating clean, reliable power at this new nuclear unit, which will serve our

customers over the next 60 to 80 years," said Kim Greene, chairman, president and CEO of Georgia Power....

Connecting to the electric grid is part of ongoing startup testing for Vogtle Unit 3, and operators will continue to raise reactor power for electricity generation while performing tests at various power levels. This Unit 3 milestone follows initial criticality, reached on March 6, when operators safely started the nuclear reaction inside the reactor, generating nuclear heat to produce steam. Once all startup testing is successfully completed and the unit is available for reliable dispatch, the unit will enter commercial operation.

At Unit 4, hot functional testing, which began last month, marks the last series of major tests underway for the new nuclear unit ahead of initial fuel load. The testing is being conducted to verify the successful operation of reactor components and systems together and confirm the reactor is ready for fuel load. As part of the testing, the site team will begin running Unit 4 plant systems, without nuclear fuel in the reactor, and advance through the testing process towards reaching normal operating pressure and temperature.

Nuclear operators will use the heat generated by the unit's four reactor coolant pumps to raise the temperature and pressure of plant systems to normal operating levels. Once normal operating temperature and pressure levels are achieved and sustained, the unit's main turbine will be raised to normal operating speed using steam from the plant. During these series of tests, nuclear operators will be able to exercise and validate procedures as required ahead of fuel load....

Source: https://www.prnewswire.com/news-releases/vogtle-3—4-nuclear-units-take-significant-steps-toward-operations-301787633.html, 01 April 2023.

Just last week the government launched its 'Powering Up Britain' plan and 'Great British Nuclear' which will start to deliver the ambition to build up to 24GWe of nuclear capacity by 2050. At the Environment Agency and Natural Resources Wales, the work delivered by our nuclear regulators is all about protecting communities and the environment. We've been looking at the Rolls-Royce SMR design to determine if it is environmentally acceptable for England and Wales.

SMALL MODULAR REACTORS

UK

Taking the Rolls-Royce SMR to the Next Step

New nuclear power stations are an important part of the government's plans for generating secure low carbon energy. Just last week the government launched its 'Powering Up Britain' plan and 'Great British Nuclear' which will start to deliver the ambition to build up to 24GWe of nuclear capacity by 2050. At the Environment Agency and Natural Resources Wales, the work delivered by our nuclear regulators is all about protecting communities and the environment. We've been looking at the Rolls-Royce SMR design to determine if it is environmentally acceptable for England and Wales.

After a year of learning about this new design and reviewing information provided by Rolls-Royce SMR Ltd, we've completed the preparatory step of our Generic Design Assessment and declared that the company is ready to start Step 2 today. The UK's nuclear regulators work together, assessing designs at an early stage, before construction begins. Doing it early means we can spot any design issues that might impact on the environment and ask Rolls-Royce SMR Ltd's designers to address them.

The Office for Nuclear Regulation (ONR) cover the safety and security whilst we and Natural Resources Wales (NRW) focus on protection of the environment and radioactive waste. The regulators have set up a joint programme office to help deliver the GDA and our teams work together in person and virtually as part of a single project. Our communications and engagement with stakeholders is also joined up and we've set up joint webpages to provide information about

GDA.

The GDA process has up to 3 steps, with our assessment getting more detailed as we progress. Now we've moved to Step 2 our team of nuclear regulators and scientists will be scrutinizing even more information from Rolls-Royce SMR Ltd, identifying issues and highlighting any concerns we have.

Step 2 is when the first technical assessment takes place and we focus on what features and arrangements are in place to protect the environment. This includes looking at how the design can be optimized to reduce the amount of radioactive waste produced and how that waste is managed and disposed of. We meet regularly with the company and it's at these meetings where we talk thorough what we've found and make sure the Rolls-Royce engineers understand our expectations....

Source: https://environmentagency.blog.gov.uk/2023/04/03/taking-the-rolls-royce-small-modular-reactor-smr-to-the-next-step/, 03 April 2023.

USA

U.S. Company Signs Deals in Europe for Small Nuclear Reactors

Last week, Washington, D.C. based Last Energy announced that it had signed agreements in the UK and Poland for thirty-four small modular reactors. Frankly, when we first saw the headline we assumed editorial failure by the UK press and moved on. But our initial impression was wrong. These are among the tiniest modular reactor designs we have seen to date, producing a mere 20 MWs of electricity. All of the 34 orders cited above collectively equal about one half of a gigawatt scale power plant regardless of type.

By contrast the proposed NuScale reactors produce 77 MWs and the GE Hitachi BWRX 300 reactor under consideration by TVA for its Clinch River site is, as the name implies, 300 MWs. But size is not the only thing that differentiates Last Energy from its more conventional competitors. Last Energy is unusual in that its financial backing comes from libertarian, Silicon Valley funders who typically have been portrayed in the press as "disrupters".

In terms of cost, the UK press cited a figure of £100 million or less per 20 MW unit, or about $6,135 per kw. This was for a total of 34 European reactors, 24 in the UK and 10 in Poland. Romania is also considering the design. The company has secured PPAs, purchase power agreements, with 4 industrial partners. In Poland they are partnering with the Katowice Special Economic Zone in southwest Poland. In the UK they have three industrial partnerships only identified as "a life sciences campus, a sustainable fuels manufacturer, and a developer of hyperscale data centers.

The company bears little resemblance to the conventional array of government-backed defense contractors representing most of the other SMR technologies. Given its background, not surprisingly Last Energy sounds to us a bit like Uber or WeWork but for new nukes. Their lofty and worthwhile goal is to reverse the impacts of climate utilizing off the shelf nuclear technology with an innovative delivery mode. Their claim is to "follow the best practices of the renewables industry: scaling of quantity rather than size."...

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Last Energy is unique in that they offer "one stop shopping" for nuclear energy purchasers. They state that, "We cover all aspects of the investment process including design, construction, financing,

service, and operation." The European Nuclear Energy Agency (NEA), which monitors nuclear issues, currently lists no fewer than twenty-one promising nuclear technologies on its SMR dashboard. (Last Energy's PWR 20 is not currently listed.)

There are multiple entries in each of the five categories of new, small nuclear technology: water cooled, gas cooled, fast spectrum, micro (which would include Last Energy), and molten salt. The dashboard approach ranks these various technologies on five criteria: licensing, siting, supply chain, engagement, and fuel. None of these technologies has as yet been commercially licensed outside of China and Russia.

From a commercial acceptance perspective, it is difficult to even hazard a guess about future SMR technology since we're really talking about a replacement cycle, mostly for aging natural gas power plants in the 2040s. Assuming that a new generation of SMRs begin operating at the end of this decade as planned, there is no reason to believe the market will coalesce around one SMR size or technology much before the mid to late 2030s.

The NEA stated that less than half of the featured technologies could obtain financing for a first-of-its-kind unit and an even smaller subset would be able to obtain purchase power agreements, which Last Energy has done…. Regardless of how they describe the regulatory/licensing process, the NEA summarizes the basic process in the US and Europe as consisting of four essential steps:

1) pre-licensing interaction with regulators,

2) design approval,

3) construction, and finally

4) issuance of an operating license and commercial operation. Stated differently, it won't matter how quickly Last Energy engineers can fabricate and assemble their PWR 20 until various regulators approve their design.

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Right now, all we can say broadly is that there seem to be two markets for SMRs, the almost utility scale reactors producing 300 MWs like the BWRX model and micro reactors in the 5-50 MW range including Last Energy. And that these are being pitched to very different types of customers. Electric utilities have been gravitating towards larger reactors for reasons of cost, bigger is still considered cheaper. Smaller reactors on the other hand have appeal for inside the fence commercial and industrial activities, provision of process steam, and compatibility with district heating systems. And this is where Last Energy seems to be making some inroads…

Source: https://oilprice.com/Energy/Energy-General/US-Company-Signs-Deals-In-Europe-For-Small-Nuclear-Reactors.html, 01 April 2023.

Saudi Arabia is exploring options to develop a nuclear energy program alongside China, Russia, or "a US ally" as talks with longtime partner Washington on the topic have "dragged on," according to officials with knowledge on the matter, the New York Times (NYT) has reported. Riyadh has for years pressed Washington for help in developing a civilian nuclear energy program as part of the kingdom's push to be "a global leader in the renewable energy sector.

NUCLEAR COOPERATION

SAUDI ARABIA–CHINA / RUSSIA

KSA Looks Past US to China, Russia in Push for Nuclear Power: Report

Saudi Arabia is exploring options to develop a nuclear energy program alongside China, Russia, or "a US ally" as talks with longtime partner

Washington on the topic have "dragged on," according to officials with knowledge on the matter, the New York Times (NYT) has reported. Riyadh has for years pressed Washington for help in developing a civilian nuclear energy program as part of the kingdom's push to be "a global leader in the renewable energy sector." "The kingdom intends to utilize its national uranium resources, including in joint ventures with willing partners in accordance with international commitments and transparency standards," Saudi Energy Minister Prince Abdulaziz bin Salman said in January after unveiling plans to use domestically-sourced uranium to build up the kingdom's nuclear power industry.

Iran has raced ahead with enrichment activity in recent months while talks on restoring the 2015 nuclear agreement have stalled. Iran knows about the US proposal, but the Iranians are not on board, saying they only want to return to the full agreement, the reports said

Last December, the Saudi Ministry of Industry and Mineral Resources announced that the kingdom's mineral wealth was valued in excess of $1.3 trillion and included copper, zinc, phosphates, uranium, and gold deposits. China is already working with Saudi Arabia on uranium prospecting. In recent years, Saudi Arabia and its Gulf partners have invested heavily in renewable energy.

Saudi Crown Prince Mohammed bin Salman (MbS) revealed last November that the kingdom would commit $2.5 billion to the so-called 'Middle East Green Initiative' over the next 10 years. US officials are reportedly wary of Riyadh's nuclear aspirations due to the Saudi government's refusal to agree to conditions intended to prevent it from developing nuclear weapons or helping other nations do so, according to the NYT...

The Biden administration has long supported a diplomatic path to halting Iran's nuclear ambitions, but talks stalled as Iran started supporting Russia in its invasion of Ukraine, and cracked down on domestic rights protesters, irking the US and other Western countries.

But despite deteriorating relations, the Biden White House approved several new arms sales to Saudi Arabia last year, ignoring both the president's campaign promise to make the kingdom a "pariah" as well as the calamity US bombs have caused in Yemen. Last year, Biden also gave MbS immunity for the murder of Saudi journalist Jamal Khashoggi after the crown prince was named prime minister.

Source: https://thecradle.co/article-view/23181/ksa-looks-past-us-to-china-russia-in-push-for-nuclear-power-report, 01 April 2023.

NUCLEAR PROLIFERATION

IRAN

US Reportedly Discusses Possible Interim Iran Nuclear Deal with Israel, Other Allies

The US has discussed with its allies a proposal for resuming talks with Iran aimed at reaching an interim deal to freeze Iran's nuclear program, according to April 3 reports. Iran has raced ahead with enrichment activity in recent months while talks on restoring the 2015 nuclear agreement have stalled. US officials informed counterparts in Israel, France, the UK and Germany that they were considering proposing a deal in which Tehran would curb nuclear enrichment above 60 percent purity, a step nearing weapons-grade levels, in exchange for sanctions relief, the Axios and Walla news websites reported....

Iran knows about the US proposal, but the Iranians are not on board, saying they only want to return to the full agreement, the reports said.... The US National Security Council said President Biden is committed to stopping Iran "and we still believe diplomacy is the best way to achieve that objective." Talks between Iran and the US to revive the deal, known formally as the JCPOA, restarted in 2021 but fell apart last year, after months of halting progress. Israel opposed a resumption of the deal....

Iran and the Western powers that are party to the talks reached several interim deals to freeze enrichment and suspend sanctions in the years leading up to the 2015 JCPOA agreement. The Biden administration has long supported a diplomatic path to halting Iran's nuclear ambitions, but talks stalled as Iran started supporting Russia in its invasion of Ukraine, and cracked down on

domestic rights protesters, irking the US and other Western countries.

Raising tensions further, inspectors from the UN nuclear watchdog in February found uranium particles enriched up to 83.7 percent in Iran's underground Fordo nuclear site. Uranium at nearly 84% is almost at weapons-grade levels of 90% — meaning any stockpile of that material could be quickly enriched for the purposes of building an atomic bomb if Iran chooses. The inspectors only mentioned finding "particles" at that level, suggesting Iran wasn't yet stockpiling above 60% — the level it has been enriching at for some time, which nonproliferation experts already say has no civilian use for Tehran. The US intelligence community has continued to maintain its assessment that Iran isn't pursuing an atomic bomb, but American officials have said Iran could produce enough fissile material for a weapon within weeks and would only need several additional months to assemble a weapon for use...

Source: https://www.timesofisrael.com/us-reportedly-discusses-possible-interim-iran-nuclear-deal-with-israel-other-allies/, 04 April 2023.

Xi, Macron Back Diplomatic Solution to Iranian Nuclear Deal

President Xi and President Macron confirmed on April 7 their commitment to resolve the stalemate in reviving the Iran nuclear deal through diplomacy. In a joint declaration, the two presidents said, "France and China reiterate their commitment to promoting a political and diplomatic solution to the Iranian nuclear issue." China and France further considered the 2015 nuclear agreement a triumph for multilateral diplomacy, as per the statement. Additionally, Xi and Macron reaffirmed their support for the UN nuclear watchdog, the IAEA, and their commitment to the full implementation of the Security Council resolution obligating states to prevent the proliferation of nuclear weapons, the statement concluded. ...

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Source: https://english.almayadeen.net/news/politics/xi-macron-back-diplomatic-solution-to-iranian-nuclear-deal, 07 April 2023.

URANIUM PRODUCTION

GENERAL

Red Book Sees Modest Decrease in Uranium Resources but Expects Nuclear Capacity to Increase

"Uranium 2022: Resources, Production and Demand", widely known as the Red Book, is the 29th edition of the OECD Nuclear Energy Agency (NEA) and IAEA's biennial report. The 568-page report presents the most recent review of world uranium market fundamentals and offers a statistical profile of the uranium industry. It includes 54 country reports on uranium exploration, resources, production and reactor-related requirements, 36 of which were prepared from officially reported government data and narratives, and 18 that were prepared by the NEA and IAEA secretariats.

Overall, global uranium resources decreased "modestly" in the reporting period (January 2019

Overall, global uranium resources decreased "modestly" in the reporting period (January 2019 to January 2021) compared with slight increases in previous recent editions. This was mainly due to mining depletion and cost category re-assignments of resources in Kazakhstan and Canada. However, Australia continues to lead with 28% of the world's identified recoverable resources. Global expenditures on domestic exploration and mine development decreased to approximately $250m in 2020, continuing a downwards trend.

to January 2021) compared with slight increases in previous recent editions. This was mainly due to mining depletion and cost category re-assignments of resources in Kazakhstan and Canada. However, Australia continues to lead with 28% of the world's identified recoverable resources. Global expenditures on domestic exploration and mine development decreased to approximately $250m in 2020, continuing a downwards trend.

Total exploration and mine development expenditures from 2018 through 2020 in the reporting countries amounted to $1.25bn, with Canada, China, India, Russia and Kazakhstan leading the way. Expenditures in Canada alone exceeded the total spending of the remaining top five countries and amounted to 44% of the total. Global uranium mine production decreased by nearly 12% from 2018 to 2020. Major producing countries limited total production in recent years in response to a depressed uranium market and the COVID-19 pandemic in early 2020. As of 1 January 2021, the annual production capacity of idled mines amounted to more than 29 400 tU. The report says these operations could potentially be brought back into production relatively rapidly given appropriate market conditions. In 2020, 16 countries produced uranium for a global total of 47 432 tU. Kazakhstan remained the world's largest producer, even as production was eased back from 21 705 tU in 2018 to 19 477 tU in 2020. Kazakhstan's 2020 production alone totaled more than the combined production in that year from Australia, Namibia, Canada, and Uzbekistan, respectively the second, third, fourth and fifth largest producers of uranium in 2020.

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These five countries accounted for 81% of global uranium output that year. World nuclear capacity is expected to rise "for the foreseeable future" and sufficient uranium resources exist to support continued use of nuclear power and significant growth in nuclear capacity for electricity generation and other uses. East Asia is projected to experience the largest increase of generating capacity in absolute terms, which, by 2040, could result in increases of 35-152 GW over 2020 capacity.

This corresponds to 130-240% increases in the low and high cases. The report notes: "It is important to note that countries of this region (e.g. China) have in recent years demonstrated the ability to build multiple reactors with predictable costs and schedules. Other regions projected to experience significant nuclear capacity growth by 2040 include the Middle East, Central and Southern Asia. The low and high cases project an additional growth of 27-51 GW compared with 2020.

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In Europe, nuclear capacity in non-EU member countries is projected to increase in the high case scenario to 93 GW by 2040. However, in the European Union, nuclear capacity in 2040 is projected to decrease by 25% in the low case scenario and increase only by 16% in the high case.... However, the 2024 edition of the Red Book will aim to provide a fuller picture of the implications of these developments on uranium demand and supply.

The report concludes: "Looking ahead, with the easing of efforts to control the COVID-19 pandemic at production facilities, and the recent run-up in the spot price of uranium in the latter half of 2021, a modest increase in the production of uranium can be expected. However, with

ongoing geopolitical tensions that threaten the continuation of some aspects of global trade in nuclear materials, the market's ability to continue supplying an adequate amount of uranium to the global nuclear fuel supply chain will be tested."

Source: https://www.neimagazine.com/news/newsred-book-sees-modest-decrease-in-uranium-resources-but-expects-nuclear-capacity-to-increase-10741481, 07 April 2023.

ROMANIA

Kazatomprom Exports Uranium to Romania via Trans-Caspian International Transport Route

Kazatomprom national atomic company delivered uranium for Romania's nuclear power plant via the Trans-Caspian International Transport Route (TITR), reported the company's press service on April 5. In December 2022, Kazatomprom won the open tender of the Societatea Nationala Nuclearelectrica SA (SNN), a Romanian state owned power-generating company, for the supply of uranium oxide.

Kazatomprom is the world's largest uranium producer with natural uranium production in proportion to the company's participatory interest of about 24 percent of the total global primary uranium production in 2021. The group has the largest uranium reserve base in the industry. Kazatomprom, together with subsidiaries, affiliates and joint organizations, is developing 26 deposits combined into 14 uranium-mining enterprises.

SNN is also the operator of the Cernavoda Nuclear Power Plant, which supplies approximately 20 percent of Romania's energy production. According to the company, it will continue to diversify the geography of supplies and enter new markets. Kazatomprom is the world's largest uranium producer with natural uranium production in proportion to the company's participatory interest of about 24 percent of the total global primary uranium production in 2021. The group has the largest uranium reserve base in the industry. Kazatomprom, together with subsidiaries, affiliates and joint organizations, is developing 26 deposits combined into 14 uranium-mining enterprises.

Source: https://astanatimes.com/2023/04/kazatomprom-exports-uranium-to-romania-via-trans-caspian-international-transport-route/, 06 April 2023.

NUCLEAR SAFETY

GENERAL

IAEA Releases Annual Data on Illicit Trafficking of Nuclear and other Radioactive Material

A total of 146 incidents of illegal or unauthorized activities involving nuclear and other radioactive material were reported in 2022, the IAEA said today in an annual fact sheet summarizing data from the ITDB. The numbers, which include some incidents connected to illicit trafficking or malicious use, remained at around the same levels as in recent years. The ITDB aims to foster global information exchange about events that involve nuclear and other radioactive material falling out of regulatory control because they were lost, stolen, improperly disposed of, or otherwise neglected.

The ITDB contains information from 143 participating states. It covers events involving nuclear material, radioisotopes and radioactively contaminated material such as scrap metal. States can also report scams or hoaxes where the material is purported to be nuclear or otherwise radioactive. This year's ITDB data is based on voluntarily submitted reports from 31 States. In five of the 146 incidents reported in 2022, there was sufficient information to determine that they related to trafficking or malicious use.

The ITDB's detailed data is confidential, and only participating States and relevant international organizations, such as the International Criminal Police Organization

(INTERPOL), can access it. The ITDB contains information from 143 participating states. It covers events involving nuclear material, radioisotopes and radioactively contaminated material such as scrap metal. States can also report scams or hoaxes where the material is purported to be nuclear or otherwise radioactive. This year's ITDB data is based on voluntarily submitted reports from 31 States. In five of the 146 incidents reported in 2022, there was sufficient information to determine that they related to trafficking or malicious use.

Additionally, trends from the ITDB show that thefts occurring during the transportation of nuclear or radioactive material stand at almost 52% of all reported cases since 1993. The figure has reached almost 62% for the preceding ten-year period, highlighting the ongoing importance of strengthening transport security measures.

Three of these five incidents involved scams. The material involved in the two other trafficking-related incidents was seized by the relevant competent authorities within the reporting States. "The ITDB maintains and analyses reported information with a view to identifying common threats and patterns," said Elena Buglova, Director of the IAEA Division of Nuclear Security. "By analysing trends in States' reports, we support international cooperation in nuclear security and help States to improve their regulations governing the use, storage, transport and disposal of nuclear or radioactive material." Elena said.

It is very important that the international community and countries, whether they have nuclear power or not, or whether they are considering it or not, recognize that the CNS is an instrument for all, and we all have a need and obligation to participate. As more governments embrace nuclear power to address both energy security and the climate change crisis, it is vital that they are committed to being bound by the CNS provisions.

A total of 4075 cases have been recorded in the ITDB since 1993. Three hundred forty-four of these cases were related to trafficking or malicious use. The frequency of such incidents remains low while cases of attempted scams involving non-nuclear material that was claimed to be nuclear or radioactive have been rising. Additionally, trends from the ITDB show that thefts occurring during the transportation of nuclear or radioactive material stand at almost 52% of all reported cases since 1993. The figure has reached almost 62% for the preceding ten-year period, highlighting the ongoing importance of strengthening transport security measures....

Source: https://www.iaea.org/newscenter/pressreleases/iaea-releases-annual-data-on-illicit-trafficking-of-nuclear-and-other-radioactive-material, 04 April 2023.

Review Meeting of Convention on Nuclear Safety Identifies Shared Priorities for Future Action

Strengthening national regulatory capabilities, taking into account safety aspects of new and innovative technologies; fostering international collaboration and peer review missions; and strengthening emergency preparedness and response arrangements were all identified as shared priorities at the Joint Eighth and Ninth Review Meeting of the Convention on Nuclear Safety (CNS), which concluded in Vienna last week. The meeting was attended by 900 delegates representing 82 Contracting Parties. IAEA Director General Grossi focused on the relevance of the Convention not only to countries with an existing nuclear power programme, but to any country considering nuclear power.

In his opening remarks, Grossi said: "The CNS is one of the most important and respected legally binding instruments in the field of nuclear safety. It is very important that the international community and countries, whether they have nuclear power or not, or whether they are considering it or not, recognize that the CNS is an instrument for all, and we all have a need and

obligation to participate. As more governments embrace nuclear power to address both energy security and the climate change crisis, it is vital that they are committed to being bound by the CNS provisions." ...

Participants were also involved in the Open-Ended Working Group to discuss procedural and other issues relevant to the functioning of the Convention, and shared their experiences and lessons learned in two topical sessions – on safety culture and on ageing management of nuclear facilities.... This concern was echoed by the President of the Joint 8th and 9th CNS Review Meeting, Dana Drábová, who said: "The objectives and purpose of the Convention are particularly important to bear in mind in these challenging times, when the safety of nuclear power plants is once again at the forefront of public concern." "We shall be mindful of the importance of nuclear safety of nuclear installations in all circumstances," she continued. "It is the aim of the CNS review process that, despite all challenges, ensuring the highest possible level of nuclear safety remains the goal at every moment."...

At the Fukushima Daiichi site, contaminated water - in part used to cool melted nuclear fuel - is treated by the ALPS system, which removes most of the radioactive contamination, with the exception of tritium. This treated water is currently stored in about 1000 tanks on site.

Obligations under the CNS: The CNS, in force since 1996 under the auspices of the IAEA, is the key international legally binding instrument that commits Contracting Parties operating land-based civil nuclear power plants to maintain a high level of safety. It does so by establishing fundamental safety principles to which States must adhere. The obligations of the Contracting Parties cover legislative and regulatory frameworks; the regulatory body; and technical safety obligations related to the siting, design, construction, and operation of nuclear installations. It also includes the availability of adequate financial and human resources and the assessment and verification of safety, quality assurance and emergency preparedness....

Source: https://www.iaea.org/newscenter/news/review-meeting-of-convention-on-nuclear-safety-identifies-shared-priorities-for-future-action, 03 April 2023.

JAPAN

IAEA Sees Progress in Safety-Related Aspects of Fukushima Water Release Plan

At the Fukushima Daiichi site, contaminated water - in part used to cool melted nuclear fuel - is treated by the ALPS system, which removes most of the radioactive contamination, with the exception of tritium. This treated water is currently stored in about 1000 tanks on site.... Japan announced in April 2021 it planned to discharge treated water stored at the Fukushima Daiichi plant into the sea over a period of about 30 years, and asked the IAEA to review its plans against IAEA safety standards.

The task force conducted a mission on 14-18 November last year, during which it met with plant owner Tokyo Electric Power Company (Tepco) and Japan's Ministry of Economy, Trade and Industry (METI) in Tokyo. It also visited the Fukushima Daiichi plant to review the progress made in the design and construction of equipment and facilities for the discharge, including the tunnel that is being built to transport the treated water one kilometer out to sea.

Its latest report assesses Tepco's technical responsibilities, including the safety-related aspects of the systems built to discharge the ALPS treated water, the radiological environmental impact assessment, source and environmental monitoring programmes, and occupational radiation protection. The report says Tepco has taken account of the issues raised during the previous technical mission in February 2022 and has made significant progress to update its plans in accordance with feedback from the task force.

It says any additional revisions made since the November 2022 mission will be assessed as part of the ongoing safety review after they are

finalized and also approved by Japan's Nuclear Regulation Authority. The task force said it would need to finalize the full safety review of the planned water discharge - encompassing technical, regulatory, and independent sampling and analysis aspects - before concluding whether Tepco had addressed the fundamental safety principles.

"The task force was satisfied that our observations were considered and reflected in revisions to key documents such as the Radiological Environmental Impact Assessment," said Gustavo Caruso, Director and Coordinator for the ALPS Safety Review, IAEA Department of Nuclear Safety and Security and chair of the task force. The task force's safety review continues. Two more reports will be released - on regulatory and independent sampling and analysis aspects - before a comprehensive report detailing the collected findings and conclusions of the task force across all aspects of the review is issued later this year.... In response to the latest report, Tepco said it "will continue to make absolutely sure that it guarantees safety when handling ALPS treated water by subjecting its initiatives to IAEA reviews that compare them to international safety standards, while providing information to parties both in Japan and overseas in a highly transparent manner".

Source: https://world-nuclear-news.org/Articles/IAEA-sees-progress-in-safety-related-aspects-of-Ja, 06 April 2023.

SOUTH KOREA

S.Korea Suspends Operation of Kori-2 Reactor for Permission Renewal

South Korea has temporarily suspended the Kori-2 nuclear reactor for safety inspections and improvements required to extend its operations, its operator said on April 9. The No. 2 reactor at the Kori Nuclear Power Plant, located in Busan, 325 kilometers southeast of Seoul, was halted on April 8 at 10PM upon the expiry of its 40-year permission to operate, according to the Korea Hydro & Nuclear Power (KHNP) Co, Yonhap News Agency reported.

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The industry ministry earlier said that the suspension was inevitable as the process to extend its life span has been delayed due to the previous government's nuclear phase-out policy. The government began procedures to resume its operations recently. The extension process is expected to take around three to four years, but the government is seeking to move up the schedule as much as possible to June 2025 as long as safety is ensured.

Demolition of the "highly deteriorated and contaminated" facility by the end of this year has been identified as a 2023 priority for the US Department of Energy Office of Environmental Management (EM).

Even if the process is expedited, the reactor is expected to be suspended for at least two years and two months. The Kori-2 unit began commercial operations in April 1983 as the country's third nuclear reactor. Currently, South Korea operates 18 out of its 25 nuclear reactors. The Yoon Suk Yeol government reversed the nuclear phase-out policy of the previous administration and is working to expand the country's generation of nuclear power to boost energy security and better achieve net-zero goals....

Source: https://www.daijiworld. com/news/newsDisplay?newsID=1068573, 09 April 2023.

USA

Demolition of Famous US Reactor Begins

This reactor was built as a mock-up of the Materials Test Reactor that was being

constructed at the Idaho National Laboratory, the LITR - also known as Building 3005 - operated from 1951 to 1968. As well as being used for training purposes, experiments at the reactor established the feasibility of water-cooled reactors and the LITR was one of the design prototypes for commercial nuclear power plants.... Demolition of the "highly deteriorated and contaminated" facility by the end of this year has been identified as a 2023 priority for the US Department of Energy Office of Environmental Management (EM).

The Oak Ridge Office of Environmental Management and its cleanup contractor, UCOR, began tearing down the facility in late March, after nearly five years of planning and deactivation work. The unique conditions associated with the facility - including structural concerns such as slab floor structures that were not adequately supported, and original facility drawings with insufficient information to support work planning - have posed additional challenges and complications.

Workers used high-tech equipment to detect previously undocumented radiological material in some areas of the facility to enable characterization work that could not be supported from the original drawings. Workers are now taking down ancillary facilities, with the goal of demolishing all structures surrounding the reactor, removing and sampling additional shield blocks to support waste disposal, and tearing down and packaging the reactor for transport and disposal.....

Source: https://www.world-nuclear-news.org/Articles/Demolition-of-famous-US-reactor-begins, 06 April 2023.

VIETNAM

Viet Nam Makes Progress to Set Up National Nuclear Security Regime: IAEA Team

An IAEA team concluded an International Security Advisory Mission (INSServ) to Viet Nam today. The team said the country has made progress towards establishing an effective national nuclear security regime for nuclear or other radioactive material out of regulatory control. It encouraged Vietnamese authorities to further integrate existing systems and measures into a national nuclear security policy.

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The mission — the first of this kind to Viet Nam — was conducted at the request of the Government and hosted by the Viet Nam Agency for Radiation and Nuclear Safety (VARANS) from 19 to 31 March. INSServ missions aim to help States to better prevent, detect and respond to criminal and intentional unauthorized acts involving nuclear or other radioactive material lost, missing, stolen, improperly disposed of, or not adequately stored or handled. These cases are known as Material out of Regulatory Control or MORC.

INSServ missions aim to help States to better prevent, detect and respond to criminal and intentional unauthorized acts involving nuclear or other radioactive material lost, missing, stolen, improperly disposed of, or not adequately stored or handled.

During the mission, the INSServ team met with officials to discuss and review the country's laws and regulations. The team assessed the roles and responsibilities of authorities that deal with nuclear security and their stakeholders.... "A strong nuclear security culture and a smooth cooperation among involved stakeholders are essential for the detection and response to criminal acts involving nuclear or other radioactive material," said Elena Buglova, Director of the IAEA Division of Nuclear Security.

"By requesting a full scope INSServ mission, Viet Nam has shown its commitment to further focus

on areas such as the legislative and regulatory framework for nuclear security in relation to MORC, the sustainability of detection systems and measures, and the response system related to MORC." Buglova said. The INSServ team made several recommendations to Viet Nam to enhance its nuclear security regime concerning MORC.

... The team included four other nuclear security experts from Brazil, Malaysia, Pakistan, the United States of America and one from the IAEA. The team also identified a number of good practices, including Viet Nam's cooperation with other countries to share information for better understanding of threats and to activate response mechanisms in a timely manner; an on-going research programme on radiation detection instruments for ensuring a sustainable approach at the national level; and the capacity built in the area of nuclear security systems and measures for major public events. ...

Source: https://www. devdiscourse.com/article/science-environment/2403337-viet-nam-makes-progress-to-set-up-national-nuclear-security-regime-iaea-team, 03 April 2023.

NUCLEAR WASTE MANAGEMENT

GENERAL

Extract Energy from Used Nuclear Fuel, Says Environmental Group

In its new report - What a waste: How fast-fission power can provide clean energy from nuclear waste - RePlanet says Europe's nuclear power reactors "have a long history of safe use, and have provided prodigious quantities of clean electricity for decades". However, it notes that they use less than 1% of the actual energy potential in the natural uranium used to make their fuel and irradiated fuel assemblies removed from reactors are considered 'nuclear waste'.

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"While this nuclear 'waste' is not a serious environmental or health threat - it occupies trivial volumes compared to waste produced by other industries, and does not harm anyone if properly shielded and safeguarded - it does provide a political challenge, and is among the most oft-cited reasons for continued opposition to carbon-free nuclear power," the report says....

If unconventional uranium and thorium resources are considered in the global picture, nuclear fuel is essentially limitless: sufficient to supply a growing human civilisation with carbon-free energy for tens of thousands of years, and likely far longer"....

The report found that using a calculation based mainly on current inventories of uranium, "there is sufficient energy in nuclear 'waste' to run Europe at current electrical power consumption" for between 600 and 1000 years. It adds: "If unconventional uranium and thorium resources are considered in the global picture, nuclear fuel is essentially limitless: sufficient to supply a growing human civilisation with carbon-free energy for tens of thousands of years, and likely far longer"....

Launching the report, RePlanet campaigners call on green parties of Europe to end their "dangerous and unscientific" opposition to nuclear energy. This, it says, is particularly important given the recent release of the Intergovernmental Panel on Climate Change (IPCC) Synthesis Report, which shows the world is rapidly running out of time to cut carbon emissions sufficiently to meet the Paris goal of 1.5°C. ...

"Current political narratives treat spent nuclear

fuel like it is a waste product that needs to be buried underground, leaving a toxic legacy for future generations," said Mark Lynas, climate author and RePlanet co-founder. "Anti-nuclear campaigners never tire of repeating this mantra in their campaign to shut down nuclear plants irrespective of our climate emergency. However, we show in this RePlanet report that nuclear waste simply needs to be recycled efficiently in order to generate centuries of clean power for Europe and the UK. This material is not waste, it is fuel for the future." "The IPCC has again made it extremely clear that we just have to get off fossil fuels, and that opposing clean energy technologies like nuclear puts the world on the path to irreversible climate breakdown," said RePlanet Secretary General Karolina Lisslö Gylfe.

Source: https://world-nuclear-news.org/Articles/Extract-energy-from-used-nuclear-fuel,-says-enviro, 04 April 2023.

Centre for Air Power Studies

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

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