



OPINION – Marianne Hanson

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The Darkening Prospect of Mass Destruction on Earth

Last week marked the 54th anniversary of the NPT. The treaty was designed to freeze the number of states with nuclear weapons – beyond the five countries that had already developed these weapons prior to 1967 – in the hope of averting what John F Kennedy warned was ‘the darkening prospect of mass destruction on earth’. Australia ratified the NPT in 1973. It has since been a self-declared champion of the need to prevent nuclear proliferation. But it continues to ignore a key requirement spelled out in the NPT, namely, the need to take ‘effective measures in the direction of complete nuclear disarmament’.

The most effective of all measures that could be taken – and indeed the logical outcome of the NPT – was the decision made in 2017 to make all nuclear weapons illegal, and to ban them under the UN’s Treaty on the Prohibition of Nuclear Weapons (TPNW). Yet Canberra has not yet signed up to this vital step. Instead, it continues to give unwavering support to the NPT, despite the fact that this treaty is suffering from several maladies, and may not remain a viable treaty for much longer unless effective

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The NPT: A Success Story for Curbing Nuclear Proliferation: President Kennedy had warned in the 1960s that unless global restraints were put in place, the world might see 25 or more nuclear weapon states by the late 1970s. Thanks to the normative and legal pressure of the NPT, the vast majority of states disavowed nuclear weapons. Only four states (India, Pakistan, Israel, and since 2003, North Korea) have rejected the treaty and gone on to

develop their own nuclear arsenals – and while the failure to stop these four states is regrettable, we must give credit to the NPT for these numbers mercifully low.

The NPT was based on an extraordinary bargain: the five existing nuclear states – at that time the US, the Soviet Union, Britain, France, and China – wished to prevent other states from acquiring nuclear weapons. And in exchange for the rest of the world saying no to nuclear weapons, they would eventually get rid of their own arsenals. All states were obliged, under the NPT's Article VI to 'pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament.'

This promise to disarm, plus an agreement to allow non-nuclear weapon states access to nuclear materials and technology for peaceful purposes, was accepted by (most of) the rest of the world, on the understanding that the inequality of the NPT – in terms of who could legitimately possess nuclear weapons and who could not – was only a temporary arrangement. Eventually, disarmament would occur, as Article VI presaged. And even if some states were hesitant about the good-faith nature of the treaty, it was clearly in their interests that nuclear proliferation should be halted. And so, they signed, expecting that the five nuclear states would keep their word. In 1995, they were persuaded to extend the NPT indefinitely, although by then there was concern that the

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On top of this, every arms control agreement between the US and Russia, and between Russia and Western Europe more broadly, has been discarded. The Anti-Ballistic Missile Treaty, the Intermediate Nuclear Forces Treaty, the Conventional Forces in Europe Treaty, and the Open Skies Treaty are all lost. And the hugely important New START agreement between the US and Russia has been suspended. All this as relations between Washington and Moscow and Washington and China are at an all-time low.

nuclear weapon states were keeping their arsenals even as they repeated their promises to disarm.

A Range of Maladies Troubles the NPT:

Although bilateral agreements between the US and Russia brought down the number of nuclear weapons, there remain around 12,500 of these weapons in existence, many of them vastly more destructive than the Hiroshima bomb. The nuclear weapon states show no signs of moving to the elimination of their nuclear arsenals. Instead, they continue to threaten using their nuclear weapons (notably by Russia at the beginning of the Ukraine war, by the US recently against China, and outside of the NPT, by Israel against Gaza).

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idea of summit diplomacy or even dialogue between leaders to minimise dangers seems to be deeply out of fashion.

This has not been lost on the non-nuclear states; at every NPT Review Conference since 2000, they

have shown their disappointment at the refusal of the nuclear states to take their disarmament obligations seriously. Many of them regret extending the NPT in 1995, and now believe that the nuclear states are intent on keeping their weapons indefinitely, while expecting non-nuclear states to live with this unequal situation. Their view is that a handful of nuclear weapon states hold the rest of the world hostage as they continue to threaten destruction of large parts of the world.

And they certainly do not have confidence that nuclear deterrence will always work. As a result, many argue that the NPT is now 'in mortal peril'. The nuclear states, while continuing to promise that they will disarm, are all modernising their arsenals and show no indication of fulfilling their NPT pledge. Because of these broken promises, there is the possibility that some non-nuclear states might leave the NPT, opening the door to further nuclear proliferation. This would be a dangerous outcome.

The Treaty on the Prohibition of Nuclear Weapons: An 'Effective Measure' Required by the NPT: The frustration felt by

many non-nuclear states led naturally to the TPNW. After decades of hoping that the elimination of these weapons of mass destruction could be achieved via the NPT, non-nuclear states voted to create a new treaty, making them illegal under international humanitarian law for all states. It was a logical outcome of the NPT, which is now seen increasingly as unfit for purpose, at least in the way it is currently constituted. The TPNW currently has 93 states as signatories, and this number is set to grow. Its value lies in the normative pressure it can bring to bear on states that retain their

nuclear weapons. Its fundamental message is that just like the other weapons of mass destruction nuclear weapons must also be delegitimised, prohibited, and eventually destroyed.

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Canberra can Rest Easy on the Interaction of the TPNW with the NPT: Our PM has noted that the government will sign the TPNW, 'after taking account of the need to ensure the interaction of the TPNW with the longstanding NPT'. This is one of three issues the government has said it will consider before signing.

None of these issues presents any serious obstacle to Australia signing up, least of all the compatibility of the TPNW with the NPT. Canberra will know that interactions between the two treaties are harmonious and coherent. All states who have signed the TPNW remain members of the NPT and participate fully in NPT Review Conferences. But they do see far more promise in the TPNW, while the NPT continues to be mired in its inequalities and unfulfilled promises.

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There has been considerable research on how states such as Australia can overcome

their hesitations and sign the TPNW. The issues to take account of can be met easily; indeed, Australia has an obligation as an NPT member to support effective measures called for by the NPT, such as the TPNW. The TPNW is already supported by some US allies (and populations in some NATO states are exploring ways of joining the treaty). The Labor government has shown some positive moves towards the TPNW, and it is to be commended for this. But it must realise that ardently supporting the NPT, without doing the same for the TPNW, is no longer a rational pathway forward.

The problem is this: the NPT is ailing, largely due to the intransigence of the nuclear states. As a result, an important measure, the TPNW, was taken in 2017. But if they do not support the TPNW, states may find that their faith in the NPT does little to help that treaty. The NPT, despite its importance and contribution, may wither and fail. It can be rescued, but this depends on its signatories, including Australia, taking seriously the 'effective measures' it requires, including signing the TPNW and encouraging the nuclear states to disarm.

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Source: <https://johnmenadue.com/the-darkening-prospect-of-mass-destruction-on-earth/> 14 March 2024.

OPINION – David Kearn

Strategic Myopia: The Proposed First Use of TNWs to Defend Taiwan

The US first deployed nuclear weapons in Europe in September 1954. Over time, thousands were sent to a series of bases to offset the vast conventional advantage of Red Army and Warsaw Pact forces, and deter their use against NATO allies. These weapons were not only viewed as important for defending the alliance but also for maintaining an unambiguous link to U.S. strategic nuclear forces that would virtually guarantee any Soviet incursion into Western Europe would quickly escalate to general nuclear war, or so the logic was explained.

In reality, serious questions persisted throughout the Cold War concerning the utility of tactical nuclear forces, the capacity to control nuclear

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escalation, and the willingness of the US to tie its fate to that of its European allies. Scholars and practitioners devoted significant time and effort to analysing the problem of fighting limited wars against nuclear-armed adversaries, attempting to devise means to achieve strategic objectives while avoiding escalation to a large-scale nuclear exchange and mutual catastrophe. Their efforts bore little fruit.

China's rapid nuclear build up, after a massive two-decade program of conventional military modernization, confronts the US once again with the prospect of fighting a conventional conflict against a major nuclear power. It may be prudent to revisit the topic of limited nuclear war and the use of tactical nuclear weapons given the challenges of the current security environment. However, one idea that has emerged from the Scowcroft Center at the Atlantic Council seems particularly short-sighted and fraught with dangers: the proposal to plan and

prepare for the first use of tactical nuclear weapons against a Chinese naval and amphibious force massed in the Taiwan Strait in the initial stages of an invasion.

In a series of recent reports, analysts from the Scowcroft Center argue that the potential first use of tactical nuclear weapons by the US would be particularly useful against an enormous Chinese amphibious invasion force as it began to stage operations off Taiwan's coast. It would have a high probability of destroying or crippling the fleet and therefore defeat the invasion, its use against military targets in the Taiwan Strait would minimize collateral

damage, and its clear limitation to explicitly military targets would mitigate potential escalation dynamics by avoiding more provocative targets on the Chinese mainland, for example.

Acknowledging the importance of defending Taiwan, the proposal seems to be an overreaction to a significant — but not irreversible — shift in the conventional military balance in the region in

China's favor. So, first and foremost, it is not clear that such a policy shift is necessary. It is also not evident that a deterrent threat based upon the first use of tactical nuclear weapons would have the desired, decisive impact on Beijing that the authors seek. If employed, such a

policy would trigger dangerous escalatory dynamics — something proponents downplay. The proposal is likely to be seen as dangerous and provocative, alarming allies and increasing regional tensions. Finally, it may undermine broader U.S. foreign policy goals, such as non-proliferation. Fortunately, the military challenge of a Chinese invasion can be addressed with existing and planned conventional forces, making such a radical departure from U.S. national security policy unnecessary.

The Resort to First Use of Tactical Nuclear Weapons: A Rash Overreaction:

While the conventional military balance in the Taiwan Strait has certainly shifted in China's favor over the past two decades, the first use of tactical nuclear weapons against an invasion force is an extreme and unnecessary option. Precisely because that large force would have to traverse nearly a hundred nautical miles to reach shore on Taiwan, it would be highly vulnerable to a host of conventional military options that the US currently possesses or could feasibly develop and deploy in short order to credibly threaten the success of

such an operation. For example, U.S. attack submarines coordinating with long-range U.S. bombers carrying conventional cruise missiles and other precision-guided munitions should be able to significantly attrit Chinese forces as they attempt the risky voyage across the strait.

Various analysts have offered several potentially inexpensive and innovative concepts based on

autonomous unmanned underwater vehicles, mines, and other counter measures that could be developed relatively quickly. Two platforms that seem particularly useful that are scheduled for retirement with no planned follow-on programs are the four nuclear-powered,

Ohio-Class guided missile submarines (each of which carry up to 154 conventionally armed cruise missiles, as well as mines and unmanned underwater drones), and the B-1B bomber, which can deliver precision-guided munitions and anti-ship missiles from ranges outside of contested

areas. The central objective is to confront China's leadership with the high probability that its invasion force will be severely degraded — if not destroyed — during its misguided attempt to reunify Taiwan by force. The US can achieve this without resorting to the threatened first use of tactical nuclear weapons through continued

investment in conventional platforms, munitions, and innovative countermeasures.

Impact on Deterrence: Less than Meets the Eye:

The proposed shift to planning and threatening — whether overtly or tacitly — the first use of tactical nuclear weapons is unlikely to significantly enhance the ability of the US to deter China from attacking Taiwan. Taiwan is not a formal treaty ally, and thus it enjoys no guarantee of direct military intervention by the US on its behalf in the

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Taiwan is not a formal treaty ally, and thus it enjoys no guarantee of direct military intervention by the US on its behalf in the event of an attack. Thus, a U.S. deterrent threat to employ nuclear weapons against a conventional invasion force after nearly 80 years of non-use of nuclear weapons, and in the face of likely Chinese escalation, may not be perceived as credible.

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A credible deterrent threat is composed of material capabilities and an assessment of the defender's resolve. The former typically comprises military forces sufficient to ensure that the expected costs suffered by the adversary in response to taking a proscribed action is so high as to undermine any perceived benefits accrued (punishment), or that the risks of failure to achieve the adversary's objectives are so great that doing so is seen as futile (denial). The latter — a defender's resolve — is more difficult to achieve and sustain with confidence. It boils down to

a psychological relationship between the defender and the adversary in which the adversary believes that the defender has the will and commitment to follow through on its threat should the adversary take unwanted action. Detering an aggressive and risk-acceptant adversary from launching a direct attack may be difficult. But given that the defender is fighting for its people, territory, and survival as a sovereign state, making the adversary believe that the costs and risks will outweigh any expected benefits should be straightforward with the possession of sufficient military power.

The challenge of constructing and sustaining a credible deterrent threat becomes significantly more difficult when a defender attempts to prevent an adversary from acting against a third-party, such as an ally. Extending a deterrent guarantee demands making an adversary believe not only that the defender will follow through on its commitment and intervene on behalf of its ally in the event of an attack, but also that the defender is willing to suffer significant damage in doing so. With the advent of nuclear weapons and the arrival of a strategic nuclear stalemate

between the US and the Soviet Union — where either superpower could annihilate the other in the event of a large-scale nuclear exchange — maintaining a strong and credible deterrence that extended to NATO allies required careful calibration of military capabilities, extensive and painstaking diplomacy, and constant reassurance to maintain alliance cohesion.

While the *Taiwan Relations Act* can be interpreted as obligating the US to support Taiwan with direct military intervention in the event of a Chinese attack, it is equally valid to interpret the commitment to "provide Taiwan with arms of a defensive character" and "maintain the capacity of the US to resist any resort to force or other forms of coercion" as primarily constituting military aid, vital supplies, and other forms of material support. This is simply not the formal diplomatic and

security relationship that would provide a foundation to consider the potential use of nuclear weapons under virtually any circumstance, never mind launching a nuclear first strike against an adversary's conventional forces.

Moreover, U.S. public support for Taiwan, which is as high as it has ever been according to polls, supports aiding Taiwan to defend itself against China in the event of an attack, but consistently opposes any direct military intervention by the US. Taken together, these two facts — an ambiguous and murky diplomatic obligation and scant public support for direct U.S. involvement — significantly undermine the credibility of a threat of U.S. nuclear use in the Taiwan context. If implemented as a formal U.S. policy, it could place an unfortunate U.S. president in an interminably difficult position of a credibility trap — forced to choose between utilizing tactical nuclear weapons in a situation that does not directly engage vital U.S. national security interests or standing down. For this reason alone, it should be rejected.

Source: <https://warontherocks.com/2024/03/strategic-myopia-the-proposed-first-use-of->

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tactical-nuclear-weapons-to-defend-taiwan/, 14 March 2024.

OPINION – Barbara Slavin

How to Prevent a Nuclear Crisis with Iran

Non-proliferation experts are scrambling for new ideas to avoid what some have called a binary choice between bombing Iran and Iran with a bomb. Amid wars in Gaza and Ukraine, attacks on Red Sea shipping, tit-for-tat killings between Americans and Iran-backed militias in Iraq and Syria and skirmishes across the Israel-Lebanon border, an issue that once galvanized the international community has receded into the background. Yet Iran's nuclear program is advancing largely unchecked, posing an additional potential flashpoint for a world already overloaded with crises.

According to the latest report by the IAEA, Iran had amassed more than 5,000 kilograms of enriched uranium by the end of February 2024, of which more than 120 kilograms were enriched to 60 percent purity, perilously close to weapons' grade. That is enough, if further enriched, to make several bombs. Under a 2015 nuclear deal, the JCPOA, Iran was allowed only 200 kilograms of uranium enriched below 5 percent until 2031 and its entire program was subject to unprecedented scrutiny by the IAEA. That deal fell apart after the Trump administration quit in 2018, while Iran was in full compliance. Iran waited a year before beginning to move beyond the JCPOA's restrictions and has kept on going as efforts by the Biden administration, the European Union and others to restore the deal have faltered.

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In September 2023, the U.S. and Iran did manage to reach an informal understanding on a series of disputes that slowed Iran's accumulation of 60 percent uranium and also freed five U.S.-Iran dual nationals who were held in Iranian jails. In return, the U.S. eased enforcement of efforts to block Iranian oil exports and gave South Korea a green light to release \$6 billion in Iranian oil revenues that had been frozen in South Korean banks

because of U.S. sanctions. The money was transferred to banks in Qatar but has essentially been refrozen in the aftermath of the deadly attack by Hamas on Israel of Oct. 7, 2023, and rising tension between the U.S. and other Iran-backed militant groups after Israel invaded Gaza. The Gaza war pre-empted what was

supposed to be a follow-on meeting in Oman in late October between Iranian officials and Brett McGurk, White House coordinator for the Middle East and North Africa. McGurk did participate in indirect talks with Iran in Oman in January 2024,

according to published accounts, but the main topic was to urge Iran to exert pressure on the Yemeni Houthis to halt their attacks on shipping in the Red Sea. A second meeting in February was postponed as the Biden administration focused on getting an Israel-Hamas cease-fire and freeing Israeli hostages.

Non-proliferation experts are trying not to be distracted by the war and are scrambling for new ideas to avoid what some have called a binary choice between bombing Iran and Iran with a bomb. Iranian officials insist that they are not seeking weapons and that the only thing that could provoke them to develop a bomb would be a U.S. or Israeli attack on the Iranian homeland. The latter appears unlikely now, but President Biden has repeatedly said he would not allow Iran to develop nuclear weapons and has not excluded

military action. Recent comments by a veteran Iranian nuclear expert, Ali Salehi, that Iran possesses “all the pieces” necessary for a bomb have heightened concerns. With the window for progress under Biden’s first term closing, Iranian officials appear to be trying to increase their leverage in case Donald Trump returns to the White House. They also understand that Biden is reluctant to make significant concessions during an election year, having already been accused of “appeasement” over last year’s informal understanding. Whoever wins, however, will have to confront the issue soon.

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The U.N. Security Council Resolution that enshrined the JCPOA expires in October 2025. After that, the only international constraint on Iran will be its promise, as a signatory of the NPT to continue to forswear nuclear weapons, as well as a religious ruling or fatwa against developing weapons of mass destruction issued some time ago by Iranian Supreme Leader Ayatollah Ali Khamenei and widely discounted by Iran’s adversaries.

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Given their bitter experience with the Trump withdrawal, Iranians have sought guarantees that any additional constraints they accept will have concrete benefits for Tehran that cannot be removed with the stroke of a pen. One idea is to allow Iran to hold onto a large quantity of 60 percent enriched uranium under IAEA supervision on Iranian soil, but that appears to be a non-starter unless Iran dramatically increases transparency about its program and restores

some of the intrusive monitoring provided for under the JCPOA. This could entail restoring daily IAEA access to Iran’s main enrichment facilities at Natanz and Fordow as well as allowing inspections of manufacturing sites for centrifuges to guard against undetected diversion. Iran could also finally resolve a dispute with the IAEA clarifying the source of uranium particles found at two sites undeclared to the agency. It could comply with

its legal obligation to implement a modified Code 3.1, under which a country with a safeguards agreement with the IAEA must inform the agency as soon as it has made the decision to build a new nuclear facility, rather than six months before introducing nuclear material. If Iran wants to be able

to continue as essentially a nuclear weapons threshold state without generating wider international opposition, greater accountability and transparency are a minimum requirement.

Another idea is to utilize Iran’s year-old restoration of diplomatic relations with Saudi Arabia to devise a regional deal that would compensate Iran with Arab investment in return for

rolling back some of its nuclear advances. This could also include regional cooperation on civilian nuclear energy, especially the safety of nuclear facilities. With the Saudis eager to develop their own nuclear power and the United Arab Emirates about to bring a fourth power reactor online, such regional cooperation under the auspices of the IAEA might be a useful confidence-building step. Like the rest of the world, Iran is trying to prepare itself for the possibility of a second Trump administration. Trump’s advisors have generally been very tough on Iran and vowed to ramp up their policy of so-called “maximum pressure.” However, the Saudis

and Emiratis – who bore the brunt of Iran’s retaliation for Trump’s withdrawal from the JCPOA – may advise Trump to go in a different direction.

In campaigning for his first term, Trump vowed to ditch the JCPOA, which he called the “worst” deal ever negotiated. That doesn’t mean he wouldn’t try for an alternative so long as it isn’t called JCPOA 2.0 and offers the prospect of besting Biden and equaling Barack Obama by winning a Nobel Peace Prize. Iranians might be reluctant to reward a man who ordered the assassination in 2020 of their most famous general, Qasem Soleimani. But if Trump fancies himself a master of the “art of the deal,” Iranians are practiced at handling friends and foes through the excessive flattery known as “tarooof.” Their economy faltering and their government’s legitimacy in question, the Islamic Republic could use a diplomatic win. Ultimately, there is no other way to contain Iran’s nuclear program except through diplomacy. No other path has succeeded, and a new military confrontation is the last thing a Middle East already in flames can afford.

Source: <https://www.stimson.org/2024/how-to-prevent-a-nuclear-crisis-with-iran/>, 15 March 2024.

OPINION – Al Jazeera

Why are the US and Japan Pushing to Ban Nuclear Weapons in Space?

The US and Japan proposed a United Nations Security Council resolution calling on countries not to deploy or develop any kind of nuclear weapons in space. The draft resolution did not directly name Russia, but the move comes days after a US intelligence assessment said Moscow’s antisatellite weapons posed a threat to US space capabilities. Washington fears space detonations could result in the disruption of US military satellite communications.

Last month, the administration of US President Joe

Biden claimed that Moscow was creating a space weapon designed to target US satellites. Russian President Vladimir Putin and Defence Minister Sergei Shoigu have denied developing such a weapon. “We have always been categorically against and are now against the deployment of nuclear weapons in space,” Putin said last month. “We are doing in space only what other countries have, including the United States.”

Russia warned the United States against using commercial satellites for spying after reports that Elon Musk’s company SpaceX had inked a deal with a US intelligence agency to build a network of spy satellites. Such systems, Russian Foreign Ministry Spokeswoman Maria Zakharova said, could “become a legitimate target for retaliatory measures”.

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Who Said What at the UN

Security Council Meeting? “Any placement of nuclear weapons into orbit around the Earth would be unprecedented, dangerous and unacceptable,” US Ambassador to the UN Linda Thomas-Greenfield said on Monday. Invoking the Oscar-winning film *Oppenheimer* on Monday, UN Secretary-General Antonio Guterres said “humanity cannot survive a sequel to *Oppenheimer*”. “[Countries] should not develop nuclear weapons or any other kinds of weapons of mass destruction designed to be placed in orbit,” the UN chief said during his speech at the United Nations Security Council, expressing his concerns about the nuclearisation of space.

Japan’s Foreign Minister Yoko Kamikawa, who chaired the council meeting, said: “During the Cold War, despite the confrontational environment at that time, the international community established legal frameworks to ensure the peaceful and sustainable use of outer space, which prohibit placing nuclear weapons or any other kinds of weapons of mass destruction in outer space.”

What are Space Weapons? What are Laws/Treaties to Regulate Them? Antisatellite weapons, commonly referred to as ASATs, are weapons used to interfere with other satellites. Satellites may be destroyed or rendered inoperable through a variety of methods, including physical destruction – crashing a satellite into another satellite or non-kinetic attacks like electromagnetic jamming, lasers or cyberattacks. Space-based weapons designed to target either space or ground targets may include ballistic missile defence interceptors and ground-attack weapons. They typically fall into three categories, Earth-to-space, space-to-space, and space-to-Earth.

The PTBT, formally known as the 1963 Treaty Banning Nuclear Weapon Tests in the Atmosphere, prohibits nuclear detonations in outer space and underwater environments. This was initially ratified by the US, Russia (formerly USSR) and the UK. Article IV of the 1967 Outer Space Treaty joined by 114 countries, bans WMD in outer space, including testing and deployment. At the present moment the United States, Russia, India and China have developed some form of antisatellite weaponry. On November 15, 2021, Russia launched an ASAT test hitting a Russian satellite and creating more than 1,500 pieces of orbital debris.

What Does the US Intelligence Assessment Say about Russia's Space Weapons? A US intelligence annual threat assessment report released last week said Russian space weapons pose a serious threat to US national security. "Russia continues to train its military space elements and field new antisatellite weapons to disrupt and degrade US and allied space capabilities. It is expanding its arsenal of jamming systems, directed energy weapons, on-orbit counter-space capabilities, and ground-based ASAT missiles that are designed to target US and allied satellites," it said.

The annual intelligence assessment also

highlighted threats from China, Iran and North Korea. The US Defense Intelligence Agency wrote in February 2019 report that Russia and China "are developing jamming and cyberspace capabilities, directed energy weapons, on-orbit capabilities, and ground-based anti-satellite missiles that can achieve a range of reversible to non-reversible effects".

In addition, the Senate Intelligence Committee held a hearing on March 11 where the head of the key US intelligence agencies gave their congressional testimony. Committee chair Senator Mark Warner raised his concerns in the opening of the hearing regarding space weapons: "We are now even seeing the possibility of foreign adversaries weaponising space in ways that could be massively destructive not only to our national security but to our way of life." In 2019, President

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Donad Trump launched the US space command to counter looming threats to the United States's space-based infrastructure. At present, there are no known operational orbital weapons systems, though several nations have implemented orbital surveillance networks to monitor other nations or military forces.

Will the Resolution Pass at the UN? Given Russia's veto power at the Security Council, it is unclear whether the draft resolution would pass. First Deputy Permanent Representative of Russia to the UN, Dmitry Polyansky, denounced the resolution proposed by the US and Japan as "just another propaganda stunt by Washington" and "divorced from reality".

"Any interaction will only be possible if the United States and NATO review their anti-Russian course, and when they show that they are ready to participate in comprehensive dialogue, taking into account all of those strategic stability factors and removing all of the concerns that we have about

our security," he said. Thomas-Greenfield, the US envoy, said Washington was willing to engage in bilateral arms control discussions with Russia and China. "All they have to do is say yes and come to the table in good faith," she said.

Source: <https://www.aljazeera.com/news/2024/3/21/why-us-and-japan-are-pushing-to-ban-nuclear-weapons-in-space>, 21 March 2024.

NUCLEAR STRATEGY

CHINA-USA

Can the US Counter China's Rising Nuke Capabilities?

The US policymakers view nuclear deterrence as the cornerstone of the nation's security. Since nuclear weapons' inception, the US has prioritized maintaining a robust, credible nuclear force, ready at a moment's notice. However, as per a *Newsweek* report, concerns are mounting about the aging US nuclear arsenal, especially in light of rapid advancements by China and an increasingly assertive Russia. Questions arise about whether the US is adequately investing in modernizing its nuclear capabilities for an uncertain future.

Heather Williams from the CSIS highlights the criticality of the next five years for US nuclear modernization. The US is updating its deterrent, replacing old Minuteman IIIs with Sentinels, introducing the Columbia class submarines to replace the Ohio class, and integrating the stealthy B-21 Raider. Yet, as modernization coincides with the end of the current arsenal's

The US is updating its deterrent, replacing old Minuteman IIIs with Sentinels, introducing the Columbia class submarines to replace the Ohio class, and integrating the stealthy B-21 Raider. Yet, as modernization coincides with the end of the current arsenal's lifecycle, there's concern that without swift, decisive action, and in the face of possible delays, the US nuclear position could be precarious by the next decade.

lifecycle, there's concern that without swift, decisive action, and in the face of possible delays, the US nuclear position could be precarious by the next decade, the *Newsweek* report said.

Williams stresses that decisions critical for a 21st-century nuclear arsenal are overdue. The challenges include ensuring new systems are timely,

maintaining political continuity, and developing a coherent strategy to deter adversaries and reassure allies. Failures here could lead the US into its weakest nuclear stance by 2030.

The US nuclear triad's modernization, delayed post-Cold War, is now proceeding rapidly. Issues like Minuteman III's reliability and potential delays

in introducing new systems have raised concerns. However, experts like Robert Soofer, former deputy assistant secretary of defense, assure that measures are in place to ensure a seamless transition to newer systems, the *Newsweek* report said.

The political landscape influences nuclear modernization significantly. Conflicts within Congress

and between administrations over nuclear strategies introduce uncertainties that could affect the US's ability to maintain a coherent nuclear posture.

Looking forward, the US faces challenges from China's growing nuclear capabilities and Russia's modernized arsenal. The Biden administration's Nuclear Posture Review underscores the urgency of addressing these challenges, with projections of China having 1,000 deliverable warheads by

Looking forward, the US faces challenges from China's growing nuclear capabilities and Russia's modernized arsenal. The Biden administration's Nuclear Posture Review underscores the urgency of addressing these challenges, with projections of China having 1,000 deliverable warheads by 2030. The US finds itself preparing for a potential strategic competition with two major nuclear powers, a scenario it has never faced before.

2030. The US finds itself preparing for a potential strategic competition with two major nuclear powers, a scenario it has never faced before.

Despite these challenges, there's still optimism. Solutions exist to extend current systems' lifespans and expedite the new deterrent's deployment. However, decisions must be made promptly to ensure the US is prepared for emerging threats, the Newsweek report said.

Source: <https://timesofindia.indiatimes.com/world/china/race-against-time-can-the-us-counter-chinas-rising-uke-capabilities/articleshow/108921781.cms>, 31 March 2024.

BALLISTIC MISSILE DEFENCE

INDIA

India Releases First Image of Game-Changing Missile

India released the first image of the Agni-5 ballistic missile with MIRV technology tested on 11th March. "The first successful flight-test of indigenously-developed Agni-5 missile with Multiple Independently Targetable Re-Entry Vehicle Technology has been carried out by DRDO from Dr. APJ Abdul Kalam Island in Odisha," India's MoD said on Instagram in a post along with the photo on 12th March.

India conducted a successful test of its Agni-5 ICBM, with its ability to carry multiple nuclear warheads. This test has now put India in the elite club of countries with the same capability, including the UK, France, Russia, and China. India's DRDO, the leading force behind the Agni series, has been developing missile technology to deter India's two primary adversaries, China and Pakistan. Agni-5 can carry micro-nukes, mini-nukes, and even large thermo-nuclear weapons, NDTV reported....

The Agni-5 ICBM has a range between 3,100-4,900 miles, according to the Washington think tank Center for Strategic and International Studies.

The range of the missile suggests that its primary target is China rather than New Delhi's traditional adversary, Pakistan. The missile test was conducted as China and India have been locked in a four-year-long military stand-off at their border, with thousands of soldiers deployed at the Line of Actual Control.

The Agni-5 test has allowed for the deployment of three MIRVs over a distance exceeding 2,000 miles, showcasing the missile's capability of reaching up to 3,000 miles. Rakesh Sharma, a retired Indian Army general who is now a distinguished fellow at the Vivekananda International Foundation think tank in New Delhi, recently told *Newsweek* that the test sends a signal to China. "China has attempted to geopolitically pressurize in manifold ways by creating a technological asymmetry. Indigenous development of MIRVed ICBM intimates to the region and world at large that India has the technological prowess. India also is a capable nation against an expansionist China," Sharma said.

Meanwhile, Chinese experts have said India's hypothetical enemy is China. "Usually, ICBMs have ranges greater than 5,500 KM, but this Indian missile with a range of 5,000 KM, which is also referred to as an ICBM, particularly shows that India's main hypothetical enemy is China," Qian Feng, director of the research department at the National Strategy Institute at Tsinghua University, told the Chinese state-run newspaper *Global Times* on Tuesday.

Source: <https://www.newsweek.com/india-missile-test-image-deterrence-game-changer-china-1879056>, 14 March 2024.

NORTH KOREA

North Korea Fires Short-Range Missile, Condemns U.S. for Raising Tensions

North Korea fired a short-range ballistic missile on Sunday, as it condemned U.S.-led military shows of force including the arrival of a submarine in South Korea as tantamount to “a preview of a nuclear war”. The missile was launched towards the sea off North Korea’s east coast and flew about 570 km (350 miles) before falling in the ocean, according to the South Korean Joint Chiefs of Staff (JCS). The launch came after warnings from officials in Seoul and Tokyo that nuclear-armed North Korea was preparing to test-fire a missile, including one of its longest-range ICBMs this month.

All of North Korea’s ballistic missile activities are banned by UN Security Council resolutions, though Pyongyang defends them as its sovereign right to self-defence. “North Korea’s recent ballistic missile launch is a clear violation of the UN Security Council resolution, which prohibits the use of ballistic missile technology and scientific and technological cooperation,” South Korea’s JCS said in a statement....

“The armed forces of the DPRK will thoroughly neutralize the U.S. and its vassal forces’ attempt to ignite a nuclear war and thus reliably ensure peace and security in the Korean peninsula,” the statement said, using the initials of North Korea’s official name, the Democratic People’s Republic of Korea.... The launch was immediately detected, tracked and monitored, and information

was closely shared between the US and Japan, South Korea’s military said... The three countries had said that a real-time missile information sharing system would become operational this month.

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Source: <https://www.reuters.com/world/asia-pacific/north-korea-fires-suspected-ballistic-missile-south-korea-japan-say-2023-12-17/>, 18 March 2024.

YEMEN

Yemen’s Houthis Reported to Have a Hypersonic Missile, Possibly Raising Stakes in Red Sea Crisis

Yemen’s Houthi rebels claim to have a new, hypersonic missile in their arsenal, Russia’s state media reported, potentially raising the stakes in their attacks on shipping in the Red Sea and surrounding waterways against the backdrop of Israel’s war with Hamas in the Gaza Strip. The report by the state-run RIA Novosti news agency cited an unidentified official but provided no evidence for the claim. It comes as Moscow maintains an aggressively counter-Western foreign policy amid its grinding war on Ukraine.

However, the Houthis have for weeks hinted about “surprises” they plan for the battles at sea to counter the US and its allies, which have so far been able to down any missile or bomb-carrying drone that comes near their warships in Mideast waters...

Meanwhile, Iran and the U.S. reportedly held indirect talks in Oman, the first in months amid their long-simmering tensions over Tehran’s rapidly advancing nuclear program and attacks by its proxies. Iran, the Houthis’ main benefactor, claims to have a hypersonic missile and has widely armed the rebels with the missiles they now use. Adding a hypersonic missile to their arsenal could pose a more formidable challenge to the air defense systems employed by America and its allies, including Israel.

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and has widely armed the rebels with the missiles they now use. Adding a hypersonic missile to their arsenal could pose a more formidable challenge to the air defense systems employed by America and its allies, including Israel.

Hypersonic weapons, which fly at speeds higher than Mach 5, could pose crucial challenges to missile defense systems because of their speed and manoeuvrability. Ballistic missiles fly on a trajectory in which anti-missile systems like the U.S.-made Patriot can anticipate their path and intercept them. The more irregular the missile's flight path, such as a hypersonic missile with the ability to change directions, the more difficult it becomes to intercept.

China is believed to be pursuing the weapons, as is America. Russia claims it has already used them.

The Houthis have attacked ships since November, saying they want to force Israel to end its offensive in Gaza, launched in response to Hamas' Oct. 7 attack on southern Israel. The ships targeted by the Houthis, however, have increasingly had little or no connection to Israel, the U.S. or other nations involved in the war. The rebels have also fired missiles toward Israel, though they have largely fallen short or been intercepted....

A new suspected Houthi attack targeted a ship in the Gulf of Aden on Thursday, but missed the vessel and caused no damage, the British military's United Kingdom Maritime Trade Operations center said. A later attack similarly missed a vessel in the Red Sea off Yemen's port city of Hodeida, the center said early Friday. The UKMTO reported another suspected attack early Friday off Hodeida, though details remained scarce. ...

Source: <https://www.abc27.com/international/ap-report-claims-yemens-houthis-have-a-hypersonic-missile-possibly-raising-stakes-in-red-sea-crisis/>, 14 March 2024.

NUCLEAR ENERGY

GERMANY

Germany Aims to Build Fusion Power Plant

A new funding programme for nuclear fusion research has been announced by Germany's Federal Research Minister Bettina Stark-Watzinger aimed at paving the way for the first fusion power plant to be constructed in Germany by 2040. The Federal Ministry of Education and Research (BMBF) has long supported fusion research at the Max Planck Institute for Plasma Physics (IPP) in Garching and Greifswald, at the Karlsruhe Institute of Technology (KIT) and at the Research Center Jülich (FZJ).

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"This institutional funding is supplemented by a second pillar with the new project funding programme," the ministry said. "The aim of the project funding is to advance the technologies, components and materials needed for a

fusion power plant in a first phase by the early 2030s. In the second phase, the focus is on integration into a power plant design. The funding programme is open to technology and addresses both the technology of so-called magnetic confinement and laser fusion."

In order to achieve the construction of a fusion power plant as quickly as possible, the programme is essentially based on application-oriented collaborative research as a form of public-private partnership. Projects on specific sub-technologies are to be carried out jointly by research institutions, universities and industry. The ministry said this allows new findings from research to be taken up at an early stage and know-how to be transferred to the domestic industry for further use.

"The energy crisis has shown us how important a clean, reliable and affordable energy supply is," Stark-Watzinger said. "And fusion is a huge opportunity to solve all of our energy problems. Thanks to its excellent research landscape and strong industry, Germany offers excellent

conditions for the construction of fusion power plants. "This is where we come in with our new funding programme - named Fusion 2040 - Research on the way to a fusion power plant - and we want to pave the way to the first fusion power plant in Germany. We want to build a fusion ecosystem made up of industry, start-ups and science so that a fusion power plant in Germany becomes a reality as quickly as possible."

In September last year, Stark-Watzinger announced that Germany would significantly increase research funding for fusion with an additional EUR370 million (USD403 million) over the next five years. Together with funds already earmarked for research institutions, the ministry will provide more than EUR1 billion for fusion research by 2028. In August 2011, the 13th amendment of the Nuclear Power Act came into effect, which underlined the political will to phase out fission nuclear power in Germany. As a result, eight units were closed down immediately....

Source: <https://www.world-nuclear-news.org/Articles/Germany-aims-to-build-fusion-power-plant>, 14 March 2024.

IRAQ

Iraq Discusses Nuclear Energy Plans with IAEA

Iraq's plans for SMRs and nuclear medicine, as well as its decommissioning progress, were among topics discussed during a visit by IAEA Director General Rafael Mariano Grossi. Iraq's PM Mohammed Shia' Al Sudani and senior government leaders met Grossi in Baghdad for discussions about the country's plans and the agency's support for "peaceful, safe and secure use of nuclear technology in Iraq".

Grossi said: "The IAEA has committed to support the foundations of what should be an entirely peaceful programme here in Iraq. We are living in a world where there is an intense growing interest in nuclear technology... This time we are going to get it right, in strict adherence to the non-proliferation norms and international conventions, which are indispensable."

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Iraq is looking at options such as small modular reactors for energy security and water desalination projects and has become a contracting party to the Convention on Nuclear Safety, which seeks to ensure countries operating land-based civil nuclear power maintain a high level of safety by establishing fundamental safety principles.

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There was also discussion about collaboration on nuclear medicine, oncology and radiotherapy, with Grossi saying that through its Rays of Hope programme, which aims to boost availability of nuclear medicine-based

treatments, the agency would "give more support, more equipment, more training, more capacity" for Iraq to improve cancer outcomes.

There is currently an IAEA mission to Iraq seeking to help with the development of a national integrated strategy for radioactive waste management, with Grossi saying: "It's crucial that we bring to a successful and satisfactory phase, the work of decommissioning, the work of remediation of the remnants from the past."

Source: <https://www.world-nuclear-news.org/Articles/Iraq-meets-with-IAEA-to-discuss-nuclear-energy-pla>, 19 March 2024.

KENYA

Kenya Unveils New Strategic Plan for Nuclear Energy

Kenya is taking major steps towards incorporating nuclear power into its energy mix with the launch of the Nuclear Power and Energy Agency's (NuPEA) 2023-2027 Strategic Plan. This roadmap outlines a comprehensive approach to achieving this goal, which aligns with the country's broader strategy of addressing its growing energy demands through clean, affordable, and reliable sources. The plan underscores the critical role that nuclear energy will play in Kenya's development agenda. Chairman Ezra Odhiambo emphasizes its compatibility with the nation's climate-focused energy goals.

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The launch, officiated by Energy Cabinet Secretary Davis Chirchir, coincides with Kenya's plan to begin construction of its first nuclear power plant in 2027, with an estimated completion timeframe of five years. This new strategic plan builds upon the successes of the previous 2020-2025 blueprint. NuPEA CEO Justus Wabuyabo highlights how the prior plan effectively streamlined the agency's operations and resource allocation, as mandated by the Energy Act of 2019 and other relevant legislation. ...

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Source: <https://www.mwakilishi.com/article/kenya-news/2024-03-16/kenya-unveils-new-strategic-plan-for-nuclear-energy>, 16 March 2024.

USA

US Proposed Budget Supports Nuclear Projects

The US Administration's 2025 budget request includes nearly USD1.6 billion for the Department

of Energy's Office of Nuclear Energy, with support for securing supplies of high-assay low-enriched uranium, developing new reactor technologies, supporting R&D, advancing the use of additive manufacturing and AI, and deploying US reactors overseas.

The comprehensive budget request submitted by the president to the US Congress outlines the Administration's policy and funding priorities and the economic outlook for the coming fiscal year, compiled with input from the various federal agencies. It is then considered by both House and Senate, with both legislative chambers holding hearings and creating their own budget resolutions, which must be negotiated and merged before final approval by Congress. The US fiscal year begins on 1 October.

The budget request for the DOE Office of Nuclear Energy includes USD188 million to secure a near-term supply of high-assay low-enriched uranium (HALEU) for DOE-supported research and demonstration projects, such as the recovery and down blending of government-owned legacy uranium and ramping up enrichment operations in Piketon, Ohio, to help make

limited quantities available.

The request also includes USD142.5 million to support the continued execution of five advanced reactor projects supported through DOE's Advanced Reactor Demonstration Program, and USD56 million to establish new testing facilities at US national laboratories. This includes USD12 million to finish the construction of the NRIC DOME micro reactor test bed at Idaho National Laboratory, which the Office of Nuclear Energy says could start testing designs as soon as 2026; USD16.5 million to complete the fabrication of fuel and key components for the MARVEL micro reactor

testing platform; and USD18 million to initiate construction of the LOTUS testbed.

The Office of Nuclear Energy is also requesting USD143 million to support university R&D; USD32 million to advance the use of digital tools and manufacturing methods such as artificial intelligence and additive manufacturing to strengthen nuclear supply chains, and USD8 million for projects to support the international deployment of US reactor technology. The Office of Nuclear Energy's request is part of the DOE's wider budget request which also includes USD8.5 billion to support clean energy research and innovation. USD845 million of this is earmarked for a Department-wide initiative to accelerate the viability of commercial fusion energy, coordinating academia, national laboratories, and the private sector, in support of the Bold Decadal Vision for Commercial Fusion Energy which was announced by the DOE in 2022....

Source: <https://www.world-nuclear-news.org/Articles/US-proposed-budget-supports-nuclear-projects>, 14 March 2024.

Atomic Canyon Unveils AI-Powered Search Platform for Nuclear Sector

The launch of Atomic Canyon along with Neutron, a custom-built AI search platform for the nuclear energy sector, has been announced by CEO and Founder Trey Lauderdale. With a background in developing communications and software systems for the health sector, he explained: "I got my start in healthcare, and there are definite parallels with nuclear energy, which – for good reason – is far more regulated than any other industry in the US." He added: "Both systems are slow to change, both systems produce large amounts of sensitive information and both systems must adapt to meet the need for far greater capacity. I brought a new perspective to healthcare. With Atomic Canyon, I look forward to bringing a new perspective to

nuclear energy."

The Neutron platform is "designed to improve efficiency, modernise the regulatory approval process and streamline workflows". It was trained on millions of pages of documents from the US NRC and "marks a pivotal step in advanced AI search capabilities". Beginning with Neutron, Atomic Canyon envisions empowering a "nuclear regulatory renaissance" – a new era of nuclear innovation fuelled by AI and a more efficient data navigation process....

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Neutron reduces search time from days to minutes, which will improve operations and workflows – and, in turn, drive growth and innovation in the nuclear energy sector. At Atomic Canyon, we believe AI is essential to nuclear energy, and vice versa, as we move toward a more sustainable future."

At a time of renewed support in the US and worldwide for nuclear energy, Atomic Canyon says it aims to facilitate a better, cleaner, safer nuclear future. Nuclear currently supplies about 20% of US electricity and has the lowest lifecycle emissions of any major generating source" and "operates at full power 92% of the time," making it indispensable to any decarbonisation strategy. "With this in mind, Atomic Canyon designed Neutron to help address inefficiencies in the nuclear sector.... A technological breakthrough is necessary to reduce the costs of maintaining and building new nuclear power plants – and that technological breakthrough is occurring before our eyes as artificial intelligence emerges in multi-modal forms."

In the next 3-5 years, AI is going to enable workflow optimisation equivalent to the smartphone plus cloud computing plus internet plus PC all summed together times 10, he notes. The ability to unlock the value from nuclear power will be driven from the adoption of AI across all sectors of nuclear power generation. And in an ironic twist of fate.... AI needs nuclear. The energy

demands for AI are way more than anyone expected, and if we're going to continue to feed this AI revolution the GPUs it needs, we're going to need a lot more power. Atomic Canyon will be the company to help unlock this upward circular relationship."

Source: <https://www.neimagazine.com/news/newsatomic-canyon-unveils-ai-powered-search-platform-for-nuclear-sector-11604169>, 15 March 2024.

Constellation Energy Issues Green Bond Worth \$900 Mln to Fund Nuclear Energy Projects

Electric utility Constellation Energy Corp (CEG.O), opens new tab said it is issuing a corporate green bond worth \$900 million to finance the company's nuclear energy projects. Proceeds from the 30-year term offering will help maintain and expand Constellation's nuclear power generation, the company said.

Green bonds, a financial instrument specifically designed to fund projects that deliver a positive environmental impact, have become increasingly popular with investors looking to invest in sustainable projects. The Baltimore, Maryland-based company generates electricity through its nuclear, hydro, wind and solar generation facilities, powering more than 16 million homes and businesses across the US.

Source: <https://www.reuters.com/business/energy/constellation-energy-issues-green-bond-worth-900-mln-fund-nuclear-energy-2024-03-18/>, 18 March 2024.

Google, Microsoft and Nucor Team Up on Clean Energy Development

North American steel manufacturer Nucor Corporation and US tech giants Google and

Microsoft Corporation are to work together across the electricity ecosystem to develop new business

models and aggregate their demand for advanced clean electricity technologies, including advanced nuclear. These models, they say, will be designed to accelerate the development of first-of-a-kind and early commercial projects, including advanced nuclear, next-generation geothermal, clean hydrogen, long-duration energy storage and others.

As a first step, the companies will issue a Request for Information in several US regions for potential projects in need of offtake, and encourage technology providers, developers, investors, utilities and others to get involved. By developing new commercial structures and aggregating demand from three of the world's largest energy buyers, this approach aims to reduce the risks for utilities and

developers considering early commercial projects and enable the investments that are needed - ultimately helping to bring these projects online by the early 2030s and reducing technology costs through repeated deployment.

The companies will initially focus on proving out the demand aggregation and

procurement model through advanced technology pilot projects in the USA. The companies will pilot a project delivery framework focused on three enabling levers for early commercial projects: signing offtake agreements for technologies that are still early on the cost curve; bringing a clear customer voice to policymakers and other stakeholders on broader long-term ecosystem improvements; and developing new enabling tariff structures in partnership with energy providers and utilities....

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North American steel manufacturer Nucor Corporation and US tech giants Google and Microsoft Corporation are to work together across the electricity ecosystem to develop new business models and aggregate their demand for advanced clean electricity technologies, including advanced nuclear.

they develop is transparent and scalable, Google, Microsoft and Nucor will share their lessons learned and the roadmap from their first pilot projects, and encourage other companies to consider how they can also support advanced clean electricity projects.... Last year, Microsoft agreed a new hourly energy-matching agreement with Constellation that harnesses the environmental attributes of nuclear to put the data centre in Boydton, Virginia “very close” to the goal of 100% carbon-free operation. Microsoft has also signed an agreement with fusion energy developer Helion Energy for the provision of electricity from its first fusion power plant.

Source: <https://www.world-nuclear-news.org/Articles/Google,-Microsoft-and-Nucor-team-up-on-clean-energy>, 20 March 2024.

SMALL MODULAR REACTORS

UK–USA–CANADA

Transatlantic Collaboration on SMR Regulation Expanded

A trilateral memorandum of cooperation has been signed between the British, Canadian and US nuclear regulators to collaborate on technical reviews of advanced reactor and small modular reactor technologies. The Memorandum of Cooperation (MoC) between the Canadian Nuclear Safety Commission (CNSC), the UK’s Office for Nuclear Regulation (ONR) and the US Nuclear Regulatory Commission (NRC) was signed during the NRC’s *Annual Regulatory Information Conference* in Maryland, USA, on 12 March. It was signed by CNSC acting CEO Ramzi Jammal, NRC Chair Christopher

To ensure that the project delivery framework that they develop is transparent and scalable, Google, Microsoft and Nucor will share their lessons learned and the roadmap from their first pilot projects, and encourage other companies to consider how they can also support advanced clean electricity projects.

The partners said the MoC underscores their commitment to share best practices and regulatory experience as new technologies move toward standardisation that facilitates international deployment. The agreement is expected to aid development of shared approaches for reviewing common technical safety issues to meet each country’s regulatory requirements. The agencies will also collaborate on pre-application activities, research, training, and emerging novel technical issues.

Hanson and ONR Chief Executive and Chief Nuclear Inspector Mark Foy.

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deployment. The agreement is expected to aid development of shared approaches for reviewing common technical safety issues to meet each country’s regulatory requirements. The agencies will also collaborate on pre-application activities, research, training, and emerging novel technical issues.

“Importantly, the trilateral agreement signals a partnering approach that will improve both regulatory effectiveness and efficiency, essential given the rapid growth in reactor technologies that are seeking regulatory consideration and approval,” ONR’s Foy said “This agreement shows the great progress we’ve made with our international counterparts to ensure advanced reactor technology can be safely and efficiently deployed,” added NRC Chair Hanson.

The agreement builds on the information-sharing aspects of several previous agreements, as well as recent bilateral memorandums of cooperation on SMR and advanced modular reactor (AMR) technology. International collaboration and initiatives to harmonise the regulatory process are seen as vital for the safe and successful deployment of new reactor designs such as SMRs.

The CNSC and NRC have been working together on this for several years, and in 2019 signed an MoC covering technical reviews of advanced reactor and SMR technologies. In January 2023,

Terms of Reference were signed and published between the CNSC and the ONR for an MoC between the two organisations on sharing best practice and experience around reviewing AMR and SMR technologies. The agreement also allowed for future working to facilitate a joint technical review of AMR and SMR technologies and to cover pre-application activities to ensure mutual preparedness to review them effectively and efficiently.

Source: <https://www.world-nuclear-news.org/Articles/Transatlantic-collaboration-on-SMR-regulation-expa>, 14 March 2024.

USA

Washington State Lawmakers Allocate \$25 Million to Advance SMR Development

Utility Energy Northwest wants to develop a 960 MW small modular reactor project nuclear-powered Columbia Generating Station. Washington state legislators have allocated \$25 million in the state's 2023-2025 capital budget for SMR development. The allocation is provided as a non-federal match for Energy Northwest's participation in the U.S. DOE loan programs office application. The utility wants to develop "up to 12 Xe-100 advanced small modular reactors" capable of generating up to 960 MW of electricity adjacent to the large nuclear-powered Columbia Generating Station in Richland.

The capital allocation received bipartisan support but still needs to be signed by Washington Gov. Jay Inslee. The \$25 million allocation represents the first significant investment in nuclear energy generation by the Washington State Legislature in over a decade.

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Energy Northwest said it expects to bring the first Xe-100 module online by 2030. X-energy's Xe-100 SMR is a high-temperature gas-cooled reactor. The Maryland-based company said its SMR can address a broad range of uses, including applications that currently rely on fossil fuels to produce steam and heat for processes like manufacturing, petroleum refining and hydrogen production.

Energy Northwest and X-energy have discussed plans for an Xe-100 reactor facility in central Washington since 2020. At one time X-energy's goal was to have an operational unit by 2028, starting with a 320 MW four-unit Xe-100 power plant in the state.

Source: <https://www.power-eng.com/nuclear/washington-state-lawmakers-allocate-25-million-to-advance-smr-development/#gref>, 13 March 2024.

NUCLEAR COOPERATION

GENERAL

Leaders Commit to 'Unlock Potential' of Nuclear Energy at Landmark Summit

The summit of nuclear-backing countries was jointly organised by the IAEA and Belgium, where it was held. In his opening remarks, IAEA Director General Rafael Mariano Grossi noted that it had taken 70 years since US President Eisenhower's Atoms for Peace UN speech for the first nuclear energy summit at the level of national leaders to be held.

Leaders and representatives from 32 countries at the Nuclear Energy Summit backed measures in areas such as financing, technological innovation, regulatory cooperation and workforce training to enable the expansion of nuclear capacity to tackle climate

change and boost energy security.

The summit of nuclear-backing countries was jointly organised by the IAEA and Belgium, where it was held. In his opening remarks, IAEA Director General Rafael Mariano Grossi noted that it had taken 70 years since US President Eisenhower's Atoms for Peace UN speech for the first nuclear energy summit at the level of national leaders to be held.

He said that with the need for clean energy, "this is a global effort, the world needs us to get our act together" and ensure that international financial institutions can finance nuclear and increase nuclear energy capacity "in a safe, secure and non-proliferation way". He said "COP28 made it clear: to be pro-environment is to be pro-nuclear" and the summit "shows the nuclear taboo is over, starting a new chapter for nuclear commitment".

Belgium's PM Alexander de Croo noted his country's change of policy - from closing nuclear plants to extending operation - and said it was increasingly recognised that nuclear had to be part of the mix, with renewables, if the net-zero goals were going to be met. In a series of speeches from the leaders attending, the need for energy security and carbon-free energy was frequently referenced, with International Energy Agency Director Fatih Birol saying that "without the support of nuclear power, we have no chance to reach our climate targets on time".

Which countries signed the declaration: Argentina, Armenia, Bangladesh, Belgium, Bulgaria, Canada, China, Croatia, the Czech Republic, Egypt, Finland, France, Hungary, India, Italy, Japan, Kazakhstan, Netherlands, Pakistan, Philippines, Poland, Romania, Saudi Arabia, Serbia, Slovakia, Slovenia, South Korea, Sweden, Turkey, United Arab Emirates, UK, and the USA.

A number of industry representative groups issued a joint statement in which they welcomed the outcome of the summit, and "the commitment of the national leaders assembled to the development and deployment of nuclear energy to fight climate change, provide energy security, and drive sustainable economic development....

Source: <https://www.world-nuclear-news.org/Articles/Leaders-back-nuclear-at-summit>, 21 March 2024.

EU-RUSSIA

CERN's Decision to End Cooperation with Russian Scientists Criticised by Moscow

CERN, the European Council for Nuclear Research, is to cut cooperation with Russian scientists later this year, a decision the country's Foreign Ministry Spokeswoman Maria Zakharova called "politically motivated and absolutely unacceptable." ...

The decision to end the cooperation agreement was taken in December 2023 when CERN's Council passed a resolution "to terminate the International Cooperation Agreement between CERN and the Russian Federation, together with all related protocols and addenda, with effect from 30 November 2024; To terminate ... all other agreements and experiment memoranda of

Russian scientists are continuing to work at CERN at the moment - earlier this week Pavel Logachev, director of the Institute of Nuclear Physics at the Siberian Branch of the Russian Academy of Sciences, told the TASS news agency that six of their researchers would continue their work at CERN until the end of the agreement.

understanding allowing the participation of the Russian Federation and its national institutes in the CERN scientific programme, with effect from 30 November 2024; AFFIRMS That these measures concern the relationship between CERN and Russian and Belarusian institutes and do not affect the relationship with scientists of Russian

nationality affiliated with other institutes". The cooperation agreement with Belarus will come to an end on 27 June, before the Russian one ends.

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CERN, which is based in Geneva, says its mission is to help "uncover what the universe is made of and how it works. We do this by providing a unique range of particle accelerator facilities to researchers, to advance the boundaries of human

knowledge". Among its achievements have been the Large Hadron Collider, which started up in 2009, the Higgs boson was discovered in 2012 and it was also the birthplace of the World Wide Web. CERN has 23 Member States, 10 Associate Member States and includes 17,000 people from all over the world, with more than 110 nationalities represented.

Source: <https://www.world-nuclear-news.org/Articles/CERN-s-decision-to-end-cooperation-with-Russian-sc>, 20 March 2024.

EU–USA

EU, US Eye Collaboration on Nuclear Materials

The European Union and the US intend to forge cooperation to curb the globe's reliance on Russia in the nuclear energy supply chain, a joint statement said. This was agreed at the recent US-EU Energy Council meeting in Washington, where the allies affirmed support for climate action, energy security in Ukraine and efforts to curb world demand for Russian energy.

"The Council noted the role that nuclear power can play in decarbonizing energy systems in countries that have decided or will decide to rely on nuclear energy", said the statement, shared by the U.S. DOE. "The US and the EU intend to intensify cooperation to reduce dependency on Russia for nuclear materials and fuel cycle services, and support ongoing efforts by affected EU Member States to diversify nuclear supplies, as appropriate. The Council expressed support for multilateral efforts to identify alternative nuclear energy-related suppliers across the global nuclear supply chain for relevant countries." ...

"In combination with other sources of clean energy, SMRs will play a role in achieving the clean energy transition and boosting energy security in Europe in the coming years by helping to decarbonize industry, produce low-carbon hydrogen and provide heat to industry and urban districts", it explained. "Compared to the larger, conventional nuclear power plants, SMRs have

several advantages - such as shorter construction time schedules, enhanced safety features and a sounder appeal to private investors thanks to their lower initial costs and shorter development timelines"

The IAEA says HALEU is only produced in the U.S. and Russia but only the latter makes the fuel at a commercial scale. SMRs need HALEU, which contains five to 20 percent of uranium-235, beyond the five percent level that powers most of today's nuclear power plants, according to the UN nuclear watchdog. The UK move was followed by an announcement by the U.S. DOE offering contracts worth up to \$500 million in total for HALEU production. "Currently, HALEU is not commercially available from U.S.-based suppliers, and boosting domestic supply could spur the development and deployment of advanced reactors in the US", the DOE noted in a media statement January 9 announcing the

funding offer.

However, Europe's biggest economy, Germany, has already abandoned nuclear energy. Germany on April 15, 2023, shut down its three remaining nuclear power plants. And a December 2023 briefing paper by the German Federal Office for the Safety of Nuclear Waste Management warned SMRs were costlier to build than big nuclear power plants and could still pose radioactive dangers.

Source: https://www.rigzone.com/news/eu_us_eye_collaboration_on_nuclear_materials-18-mar-2024-176108-article/, 18 March 2024.

IRAQ–IAEA

IAEA Director General Meets Iraq PM to Discuss Intensified Support for Nuclear Energy, Cancer Care and Radioactive Waste Clean-Up

IAEA Director General Rafael Mariano Grossi met with Iraq's PM Mohammed Shia' Al Sudani and senior government leaders in Baghdad on Monday [18 March]. Discussions centred on Iraq's plans for a possible nuclear energy programme,

including SMRs, with strict adherence to non-proliferation norms. Mr Grossi announced that the IAEA will intensify support for cancer care at under the IAEA's flagship Rays of Hope scheme. This scheme aims to close the cancer care gap in lower- and middle-income countries by enabling the provision of life-saving cancer treatments, such as radiotherapy, where the need is greatest....

Intensified Support for Decommissioning: The IAEA is also intensifying its support to Iraq in the decommissioning and remediating of sites which have been contaminated with radioactive material. The latest IAEA missions from 10 March to 22 March aim at incorporating Iraq's advancements into a national integrated strategy for radioactive waste management, emphasizing environmental safety and international standards compliance.

The proposed Al Tuwaitha Disposal Facility has been designed with IAEA assistance under the EU's Instrument for Nuclear Safety Cooperation project and aims to provide a solution for the disposal of low-level radioactive waste arising from the decommissioning of Iraqi nuclear installations....

High-Level Meetings Centred on Peaceful Uses of Nuclear Technology: Mr Grossi emphasized the IAEA's support for the peaceful, safe and secure use of nuclear technology in Iraq, having also spoken of the importance of non-proliferation efforts in his written statement at the Board of Governors earlier this month. He announced that a multidisciplinary team of Iraqi experts would come to Vienna in a few days, to conduct a meeting setting out a roadmap for the country's peaceful nuclear programme....

Iraq recently become a contracting party to the Convention on Nuclear Safety, which aims to commit countries operating land-based civil nuclear power plants to maintain a high level of safety by establishing fundamental safety principles.

Background on Clean-up of Al Tuwaitha Complex: The IAEA missions now underway in Iraq build on the Agency's Iraq Decommissioning Project which ran from 2006-2012 and began the clean-up of the Al Tuwaitha site and other contaminated facilities and areas of Iraq. Twenty countries and the European Commission provided financial and in-kind support. This project led to the development of decommissioning and remediation plans for some of the highest risk facilities in the country....

Source: <https://www.iaea.org/newscenter/news/iaea-director-general-meets-iraq-pm-to-discuss-intensified-support-for-nuclear-energy-cancer-care-and-radioactive-waste-clean-up>, 18 March 2024.

URANIUM PRODUCTION

AUSTRALIA

ERA Applies to Renew Jabiluka Lease

Energy Resources of Australia Limited says it has lodged an application to renew the lease in Australia's Northern Territory but says it has no plans to develop the high-grade uranium deposit. The deposit's Mirarr Traditional Owners have said they oppose both the renewal and development of the lease, which is surrounded by the World Heritage-listed Kakadu National Park.

Energy Resources of Australia Limited (ERA) has a long-term care and maintenance agreement with the Mirarr Traditional Owners that includes a veto over development of Jabiluka unless approved by the Mirarr. Renewing the lease - which is due to expire in August - extends this arrangement and is the best way to preserve this veto, and Jabiluka's cultural heritage, CEO Brad Welsh said.

The Jabiluka uranium deposit was discovered in the early 1970s and, with resources of more than 130,000 tU3O8 (110,240 tU), is one of the world's largest high-grade uranium deposits. Jabiluka is

Discussions centred on Iraq's plans for a possible nuclear energy programme, including SMRs, with strict adherence to non-proliferation norms. Mr Grossi announced that the IAEA will intensify support for cancer care at under the IAEA's flagship Rays of Hope scheme. This scheme aims to close the cancer care gap in lower- and middle-income countries by enabling the provision of life-saving cancer treatments, such as radiotherapy, where the need is greatest.

also a site of international cultural heritage significance, containing extensive rock art galleries of World Heritage significance as well as sacred sites and the archaeological site of the oldest known human occupation in Australia.

ERA Independent Non-Executive Director and former Federal Indigenous Affairs Minister Ken Wyatt said the application for the lease renewal protects the rights of the Mirarr to control the future of the site. "The best way to preserve the veto right is to renew the MLN1Jabiluka lease," he added.

The Gundjeihmi Aboriginal Corporation, which represents the Mirarr Traditional Owners, has publicly expressed its intention to oppose both the renewal and development of the Jabiluka Mineral Lease, and say the Traditional Owners "remain concerned about ERA's capacity to deliver on their commitments in Kakadu National Park": the company is currently rehabilitating the former Ranger uranium mine after more than 35 years of uranium production operations came to an end in January 2021, and recently said it will need to raise further funds this year to cover the work.

CEO of the Gundjeihmi Aboriginal Corporation Thalia van den Boogaard said the Mirarr Traditional Owners would now seek formal protection of Jabiluka's cultural heritage and called on the Australian and Northern Territory governments as well as ERA to support this. ...

Source: <https://www.world-nuclear-news.org/Articles/ERA-applies-to-renew-Jabiluka-lease>, 21 March 2024.

KAZAKHSTAN

Kazatomprom 'Action Plan' Addresses Supply Chain Risks

Kazatomprom is "fully capable" of maintaining its position as a reliable supplier of natural uranium, with an action plan that enables it to react to evolving geopolitical events, the company said in its yearly financial results statement.

Despite geopolitical tensions in 2023, the demand for nuclear power as a stable, low-carbon energy source has "notably increased", the Kazakh national atomic company's CEO Meirzhan Yussupov said. "With Kazakhstan accounting for about 40% of the world's uranium production on an annual basis, we're proud that at least every third nuclear reactor in the world runs on Kazakh uranium.

The current global geopolitical situation saw sanctions packages and lists of sanctioned goods, works and services being constantly updated throughout the year. The company said it "constantly works" to assess and monitor sanctions risks. It has developed an action plan to minimise possible negative impacts on the company's activities, which evolves upon identification of new risks and adapts to updates.

To date, events in Ukraine have not affected the group's financial position, it said. The majority of its revenues are received in US dollars, and financing is also raised in US dollars,

creating a "natural hedging effect" against currency risks.

The group - which transports material through Russia - said it continuously monitors the potential impact of sanctions on its ability to transport material, although it is not currently experiencing restrictions on activities related to supplying its products to end customers. The Trans-Caspian International Transport Route continues to mitigate the risk of Kazatomprom's primary uranium transportation route via St Petersburg being unavailable for any reason.

The Kazatomprom group's consolidated 2023 revenue, at KZT1435 billion (USD3.19 billion) was 43% up on 2022's figure, with operating profit showing a 49% year-on-year increase to KZT681 billion. The increase was mainly due to the growth in average realised prices associated with an increase in the spot market price for U3O8; an increase in sales volumes, mainly related to additional requests from customers to flex up their annual delivery quantities within existing contracts, plus some new long-term contracts with

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delivery during 2023; and an increase in revenue from the sale of uranium products related to the growth of fuel assembly deliveries from the Ulba-FA fuel plant and from Kazatomprom's rare metal products segment.

Uranium production volumes for 2024 are still expected to be 21,000-22,500 tU (100% basis), as announced in January. The company said it has "contracted the relevant volumes of sulphuric acid to meet its 2024 production guidance", but added that delays in construction works at new deposits/sites "make significant uncertainties" and may affect operating performance for the year.

Source: <https://www.world-nuclear-news.org/Articles/Kazatomprom-action-plan-addresses-supply-chain-ris>, 15 March 2024.

NAMIBIA

Bannerman Completes Scoping Study for Extended Operations at Etango

The study evaluates two future-phase options for a higher throughput and operating life post ramp-up at the project in Namibia. Bannerman Energy is currently advancing front end engineering and design, offtake marketing and strategic financing workstreams for its base-case development - Etango-8 - with a throughput of 8 Mtpa per year. Etango-8 was the subject of a definitive feasibility study (DFS) completed in 2022.

The future options investigated in the new scoping study are: a post ramp-up expansion of throughput capacity to 16 Mtpa, referred to as Etango-XP; and an extension of operating life to 27 years, referred to as Etango-XT.

Etango-XT would involve a life extension with mine and plant throughput maintained at 8 Mtpa. For

this scenario, a life-of-mine output of 95.2 million pounds over 27 years is envisaged (the Etango-8 DFS envisaged 52.6 million pounds over 15 years), with an annual average output of 3.5 million pounds U3O8 (Etango-8: 3.5 million pounds), with no expansion phase capital expenditure and a life-of-mine average all-in-sustaining cash cost of USD45.3 per pound U3O8.

All Etango-8 cost estimates, including pre-production capex of USD320 million, remain materially unchanged. Bannerman's core focus is still the development of Etango at an initial 8 Mtpa throughput scale, CEO Gavin Chamberlain said. The scoping study was done to demonstrate "the ready technical and financial viability" of expanding or extending the base case Etango operation following construction and ramp-up, he added. "As evidenced by the announced outcomes, the Scoping Study has categorically demonstrated this further growth optionality. In short, the long-term scalability of the world-class Etango resource remains highly robust under the base case Etango-8 approach to initial project development."

Source: <https://www.world-nuclear-news.org/Articles/Bannerman-completes-scoping-study-for-extended-ope>, 19 March 2024.

Namibia's Nuclear Energy Opportunities, Challenges

As Namibia strives to use its huge uranium deposits for economic growth, officials face a complicated set of opportunities and constraints. ...Namibia's uranium business adheres to a stringent regulatory framework that ensures openness, accountability, and environmental sustainability. The government's dedication to strong governance and careful resource management has increased investor trust

Uranium production volumes for 2024 are still expected to be 21,000-22,500 tU (100% basis), as announced in January. The company said it has "contracted the relevant volumes of sulphuric acid to meet its 2024 production guidance", but added that delays in construction works at new deposits/sites "make significant uncertainties" and may affect operating performance for the year.

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and established Namibia as a dependable partner in the global uranium market. Uranium production can be a significant source of revenue for Namibia. The creation of jobs in the mining sector, coupled with export earnings, could provide a much-needed boost to the national economy. However, as a nation we should not be overly optimistic.

Environmental concerns surrounding uranium mining are well documented. Potential radioactive contamination and the long-term impact on water resources need to be thoroughly addressed before large-scale expansion takes place. Furthermore, the government needs to ensure the implementation of rigorous laws and independent monitoring to guarantee safe mining methods. I believe there is a delicate balance to be struck here. The government must weigh the economic benefits against potential environmental and social costs, including political. It is key to continue the value of openness and public engagement in decision-making processes. Local communities residing near mining sites must be involved in discussions and their concerns must be addressed effectively. Furthermore, there is significance in understanding the global context. The demand for uranium fluctuates based on global energy needs and the future of nuclear power as an energy source. Namibia should diversify its economy and invest in renewable energy sources to mitigate the risks associated with a volatile uranium market, in order to strengthen its position as a leading country in sustainable energy production and supply. Namibia has the potential to benefit from its uranium resources, but it must be done responsibly and sustainably. The importance of strong environmental rules, investments in renewable energy, and a commitment to long-term economic diversification, will remain fundamental as Namibia sustainably plans to use its uranium resources and generate energy from it.

Namibia has developed strategic collaborations with prominent worldwide uranium firms to

promote knowledge transfer, talent development, and local capacity building. These collaborations have encouraged the adoption of best practices in uranium mining and processing, hence increasing Namibia's competitiveness in the global uranium market. Namibia is at a critical point in its uranium production path, ready to capitalise on economic potential while resolving accompanying concerns. Namibia can realise the full potential of its uranium sector and move the country toward a wealthy and sustainable future

by taking a comprehensive strategy that combines economic growth with environmental stewardship and social inclusion.

Source: <https://neweralive.na/posts/opinion-namibias-nuclear-energy-opportunities-challenges-as-namibia-strives-to-use-its-huge-uranium-deposits-for>, 22 March 2024.

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USA

Ur-Energy to 'Build Out' Second Wyoming Project

Ur-Energy has announced a decision to "build out" the fully permitted and licensed Shirley Basin Project in Carbon County, Wyoming. The company recently made its first shipment of uranium from the restarted Lost Creek project.

The decision to build out Shirley Basin was based on the company's growing uranium sales contracts, a strong uranium market price, and an expectation of increasing uranium demand, the company said. Building out Shirley Basin will "nearly double" the company's annual permitted mine production capacity to 2.2 million pounds U3O8 (846 tU) while diversifying supply, CEO and Chairman John Cash said.

The satellite plant at the Shirley Basin project will be a "relatively low-cost facility" consisting of ion exchange, wastewater and groundwater restoration circuits, with the capacity to produce up to 1.0 million pounds U3O8 per year, the company said. Ion exchange resin loaded with uranium from the mine will be shipped to the

operating Lost Creek in-situ leach facility for processing before being recycled back into operations at Shirley Basin. This approach will help minimise costs, with initial facility capital costs of around USD24.4 million and pre-operational wellfield development costs of USD16.3 million.

The estimated time to finalise designs, order materials and construct the satellite plant and initial wellfield is approximately 24 months, Ur-Energy said. Work has already started on long-lead items and ion exchange vessels have already been designed and ordered.

Ur-Energy has been ramping up operations at Lost Creek over the past year since its decision in 2022 to restart operations, making its first shipment of

U3O8 to the converter in February this year. The project produced a total of 22,278 pounds of drummed U3O8 in 2023; 2024's production had already reached some 32,000 pounds of drummed product as of 29 February.

Lost Creek has estimated measured and indicated mineral resources of 12.7 million pounds U3O8 and inferred resources of 6.1 million pounds, according to updated S-K 1300 reports filed by the company earlier this month. Shirley Basin is estimated to have mineral resources of 8.8 million pounds, all in the Measured and Indicated categories.

Source: <https://www.world-nuclear-news.org/Articles/Ur-Energy-to-build-out-second-Wyoming-project>, 14 March 2024.

NUCLEAR SAFETY

CANADA

NWMO Reports Reinforce Confidence in Safety at Potential Canadian Repository Sites

Canada's Nuclear Waste Management Organisation (NWMO) has published new research – the 2023 Confidence in Safety reports – on the two potential sites under consideration to host a deep geological repository (DGR) for

used nuclear fuel. NWMO says the reports reinforce confidence in safety of both sites, building on the previous 2022 Confidence in Safety reports. They support the conclusion that the NWMO is confident a DGR can be constructed at either site to safely and responsibly manage Canada's used nuclear fuel for the long term.

The site selection process began in 2010 when 22 communities expressed interest exploring their

potential to host the DGR. Following years of technical assessment and community engagement, two potential sites remain in the process: one in the Wabigoon Lake Ojibway Nation-Ignace area in north western Ontario and the other in the Saugeen Ojibway Nation-South Bruce area in southern Ontario.

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Both potential sites are situated in stable, seismically quiet settings with rock formations of the necessary depth, breadth and volume to host the repository. In addition, the studies found no economically viable resources within the rock, such as minerals, salt or gas, reducing the possibility of human intrusion in the future.

The updated Confidence in Safety reports provide a comprehensive summary of the NWMO's understanding of each potential siting area based on years of research. The reports highlight the strength of geological features in each location, which ensure the site can safely contain and isolate used nuclear fuel. They also include initial site-specific safety assessment results and additional research on the geology and engineering for both potential sites.

Once a site is chosen with informed and willing hosts, additional technical studies will be conducted to provide more precise information for the repository design and formal safety case, which will be submitted to regulators. The safety of a proposed site will also be confirmed through a rigorous regulatory review of the repository design and safety case, including through the federal Impact Assessment Act process and licensing by the Canadian Nuclear Safety

Commission. The regulatory and licensing process is expected to take approximately 10 years to complete.

Source: <https://www.neimagazine.com/news/newsnwmo-reports-reinforce-confidence-in-safety-at-potential-canadian-repository-sites-11605683>, 15 March 2024.

JAPAN

IAEA Satisfied with Fukushima Treated Water Release Process

The IAEA is satisfied with the process of releasing tritium-containing treated water from the crippled Fukushima Daiichi NPP into the sea, IAEA Director-General Rafael Marino Grossi said during a visit to Japan. The earthquake and tsunami in 2011 that resulted in triple meltdowns at the NPP caused large amounts of radioactive wastewater to accumulate. After more than a decade of clean-up work, the plant began discharging the water after treating it and diluting it with large amounts of seawater in #august 2023 – a process expected to take some 30 years.

Grossi said talks are being held with China, which imposed a ban on Japanese fishery products after the start of the water release in August last year.

The head of the U.N. atomic agency since the contentious program began months ago and called it an “encouraging start.” The soil has been in an interim storage facility in Fukushima. A government plan to recycle it for road construction and other public works after safety tests has met strong protests. The government has promised a final disposal plan outside of the prefecture by 2045.

Grossi also held talks with Foreign Minister Yoko

Kamikawa and Economy & Industry Minister Ken Saito for discussions on cooperation in nuclear disarmament, non-proliferation, North Korea and Iran as well as peaceful use of atomic energy, Japanese officials said.

During talks with Saito, Grossi offered technical assistance to improve the idled Kashiwazaki-Kariwa NPP in Niigata, operated by Tepco, which is keen to restart it as soon as possible. Kashiwazaki-Kariwa units 6&7 have passed regulators’ safety tests for a restart, but were suspended from making further preparations after security problems were revealed in 2021. IAEA is sending a team of experts to the plant shortly to assist Tepco’s efforts to gain public trust. “We want to be of assistance in helping Japan’s nuclear capacity to be up and running as soon as possible,” Grossi told Saito.

Source: <https://www.neimagazine.com/news/newsiaea-satisfied-with-fukushima-treated-water-release-process-11605466>, 15 March 2024.

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NUCLEAR NON-PROLIFERATION

GENERAL

US, Japan Urge Nations Not to Deploy Nuclear Weapons in Orbit

The US and Japan on Monday proposed a U.N. Security Council resolution stressing that nations should comply with a treaty that bars putting nuclear weapons in space, a message that appeared aimed at Russia. Washington believes Moscow is developing a space-based anti-satellite nuclear weapon whose detonation could cause havoc by disrupting everything from military communications to phone-based ride services.

The US and Japan on Monday proposed a U.N. Security Council resolution stressing that nations should comply with a treaty that bars putting nuclear weapons in space, a message that appeared aimed at Russia. Washington believes Moscow is developing a space-based anti-satellite nuclear weapon whose

detonation could cause havoc by disrupting everything from military communications to

phone-based ride services, a source familiar with the matter has said.

Russia, a party to the 1967 Outer Space Treaty that bars putting “in orbit around the earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction,” has previously said it opposes deploying nuclear weapons in space.

Russia’s defense minister has also denied it is developing such a weapon. Deploying a nuclear weapon in orbit is barred by the treaty; developing one, however, is not prohibited. In their resolution seen by Reuters, the US, the only nation to use a nuclear weapon in war, and Japan, the only nation attacked with one, urged countries bound by the treaty not to place such weapons in space and also not to develop them.

Reports about possible Russian development emerged after a Republican lawmaker on Feb. 14 issued a cryptic statement warning of a “serious national security threat.” The clearest public sign Washington thinks Moscow is working on such a weapon was a White House spokesman’s Feb. 15 comment that the lawmaker’s letter was related to a space-based anti-satellite weapon that Russia was developing but had not deployed, and that would violate the Outer Space Treaty.

Source: <https://www.reuters.com/world/us-japan-urge-nations-not-deploy-nuclear-weapons-orbit-2024-03-18/>, 19 March 2024.

NUCLEAR WASTE MANAGEMENT

CANADA

NWMO Reports Reinforce Confidence in Safety at Potential Canadian Repository Sites

Canada’s Nuclear Waste Management Organisation (NWMO) has published new research – the 2023 Confidence in Safety reports – on the two potential sites under consideration

to host a deep geological repository (DGR) for used nuclear fuel. NWMO says the reports reinforce confidence in safety of both sites, building on the previous 2022 Confidence in Safety reports. They support the conclusion that the NWMO is confident a DGR can be constructed at either site to safely and responsibly manage Canada’s used nuclear fuel for the long term.

The proposed DGR will be constructed roughly 650-800 metres below ground level and encased in a natural shield of solid rock. The repository design incorporates a series of engineered barriers to ensure the fuel can be isolated safely for many thousands of years. Both potential sites are situated in stable, seismically quiet settings with rock formations of the necessary depth, breadth and volume to host the repository. In addition, the studies found no economically viable resources within the rock, such as minerals, salt or gas, reducing the possibility of human intrusion in the future.

The updated Confidence in Safety reports provide a comprehensive summary of the NWMO’s understanding of each potential siting area based on years of research. The reports will be used to support continuing dialogue with Canadians and Indigenous peoples about the project. They will also help inform the potential host communities as they make their willingness decisions in the lead-up to a site being selected later this year.

Once a site is chosen with informed and willing hosts, additional technical studies will be conducted to provide more precise information for the repository design and formal safety case, which will be submitted to regulators. The safety of a proposed site will also be confirmed through a rigorous regulatory review of the repository design and safety case, including through the federal Impact Assessment Act process and licensing by the Canadian Nuclear Safety Commission. The regulatory and licensing process

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is expected to take approximately 10 years to complete.

Source: <https://www.neimagazine.com/news/newsnwmo-reports-reinforce-confidence-in-safety-at-potential-canadian-repository-sites-11605683>, 15 March 2024.

Canadian Township Signs Potential Repository Hosting Agreement

The agreement between the Township of Ignace and Canada's Nuclear Waste Management Organization outlines the community's role and potential benefits, and is the next step in the ongoing process to select a site for a repository for the nation's used nuclear fuel. The Ignace Council unanimously passed a resolution on 18 March to allow Mayor Kim Baigrie to sign the potential hosting agreement for the Deep Geologic Repository (DGR) with the Nuclear Waste Management Organization (NWMO). The agreement is the "next logical step" in the process of staying engaged and advancing the willingness process.

The agreement will allow the Township to facilitate the DGR by building capacities to enable it to undertake tasks that will be assigned to it through the regulatory process to host the project. The new agreement is similar to, and will replace, the current Multi-Year Funding Agreement between the Township and NWMO but will provide more direct benefits to the community through the complete life cycle of the DGR project, the council said.

The NWMO launched the process to select a suitable site for the DGR for Canada's used nuclear fuel in 2010. The selected site must have the support of "informed and willing" hosts, and some 22 communities expressed interest in taking part

The agreement will allow the Township to facilitate the DGR by building capacities to enable it to undertake tasks that will be assigned to it through the regulatory process to host the project. The new agreement is similar to, and will replace, the current Multi-Year Funding Agreement between the Township and NWMO but will provide more direct benefits to the community through the complete life cycle of the DGR project, the council said.

willingness process and the Township of Ignace respects that their decision will also be required to proceed".

Source: <https://www.world-nuclear-news.org/Articles/Canadian-township-signs-potential-repository-hosti>, 21 March 2024.

SWEDEN

SKB Breaks Ground on New Geology Building in Forsmark

Swedish radioactive waste management company Svensk Kärnbränslehantering (SKB) said a ground-breaking ceremony has taken place for a new geology building in Forsmark. The building will be a centre for the collection and evaluation of data from surveys and site monitoring on the Forsmark peninsula. Modern construction technology and durable materials will be used in the construction of the building, which will be completed by the spring of 2025.

The new geology building will be of great importance for these construction projects. Sustainability will play a key role in the construction of the building, including the use of green concrete with lower carbon dioxide emissions will be used. The frame and facade will consist of wood and the building will have a so-called sedum roof, a roof with living plants on top of the sealing layer. The goal is to reach a silver level according to the environmental certification for environmental building.

Currently SKB has a number of projects underway in Forsmark including the SFR - final repository for short-lived radioactive waste, as well as the final repository for used fuel from Sweden's NPPs.

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construction of the building, including the use of green concrete with lower carbon dioxide emissions will be used. The frame and facade will consist of wood and the building will have a so-called sedum roof, a roof with living plants on top of the sealing layer. There will also be an opportunity for electric car charging. The goal is to reach a silver level according to the environmental certification for environmental building.

The plan is for the building to be erected in early 2024 and commissioned in the spring of 2025. The following summer, existing equipment will be transferred from the old premises and operations are scheduled to start in August 2025. Veidekke signed an agreement with SKB in October 2023 to build the geology building under a turnkey valued at SEK55m (\$5.3m).

Source: <https://www.neimagazine.com/news/newsskb-breaks-ground-on-new-geology-building-in-forsmark-11597439>, 13 March 2024.

UK

UK Completes Transfer of Winfrith Waste Drums

A project to transfer more than 1000 drums of radioactive waste from the Winfrith site in Dorset, in southern England, to the Low Level Waste Repository site in Cumbria, in northwest England, has been completed earlier than expected. The project was an accumulation of eight years' work and has seen 11 consignments of drums transported by rail from Winfrith to the LLW Repository site.

A total of 1068 drums of waste from the Winfrith Steam Generating Heavy Water Reactor (SGHWR) - which ceased operations in 1990 - were placed in the Treated Radwaste Store at the Dorset site, awaiting transfer to the intermediate-level waste storage facility at the Harwell site in Oxfordshire. However, the period of radioactive decay means

the drums are now classed as low-level, rather than intermediate-level, waste, allowing early disposal at the LLW Repository, the UK's primary LLW disposal facility.

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The drums have been disposed of utilising void space in Vault 8, optimising the use of the LLW Repository, and freeing up the Winfrith facility for alternative use or decommissioning, the UK's Nuclear Decommissioning Authority (NDA) said. Final

disposal of this waste has also removed the requirement for long-term storage, saving money for the UK taxpayer....

Source: <https://www.world-nuclear-news.org/Articles/UK-completes-transfer-of-Winfrith-waste-drums>, 13 March 2024.

GENERAL

Nuclear Waste Management Market to Observe Strong Development by 2032

Radioactive hazard mitigation and environment protection, volume reduction and long-term solutions, and resource conservation & energy generation are the upcoming trends of the Nuclear Waste Management Market in the world.

According to a new report published by Allied Market

Research, titled, "Nuclear Waste Management Market," The nuclear waste management market was valued at \$4.8 billion in 2022, and is estimated to reach \$5.7 billion by 2032, growing at a CAGR of 1.9% from 2023 to 2032. Nuclear waste management involves proper handling, storage, and disposal of radioactive waste that originates from nuclear power plants, nuclear research facilities, and other applications of nuclear technology. Effective management is crucial to safeguard human health and the environment against the potential harmful effects of radiation.

The commonly used classification systems include high-level waste (HLW), intermediate-level waste (ILW), and low-level waste (LLW). HLW, which consists of highly radioactive materials, necessitates the implementation of rigorous containment measures.... Careful planning is undertaken for transport routes and security protocols to minimize the risks associated with accidents or unauthorized access. Improper management of nuclear waste results in significant hazards to both human health and the environment due to the highly radioactive materials it contains. Exposure to radiation from nuclear waste leads to various adverse health effects, such as an increased risk of cancer and genetic mutations.

Therefore, it is crucial to implement strict safety measures at every stage of the waste management process to minimize the potential for radiation exposure. The development of advanced reactor technologies, such as SMRs and Generation IV reactors, indeed holds promise for more efficient and sustainable nuclear power generation. These advanced technologies often offer several benefits that positively impact nuclear waste management....

The Nuclear Waste Management industry's key market players adopt various strategies such as product launches, product development, collaboration, partnership, and agreements to influence the market. It includes details about the key players in the market's strengths, product portfolio, market size and share analysis, operational results, and market positioning.

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By region, the nuclear waste management market analysis is done across North America, Europe, Asia-Pacific, and LAMEA (Latin America, the Middle East, and Africa). Asia-Pacific region dominated the 2022 nuclear waste management market growth. However, Europe is projected to grow at a higher CAGR during the projection years owing to lucrative nuclear waste management market opportunities in the region.

Source: [https://www.whatech.com/og/markets-research/energy/789817-](https://www.whatech.com/og/markets-research/energy/789817-nuclear-waste-management-market-to-observe-strong-development-by-2032)

[nuclear-waste-management-market-to-observe-strong-development-by-2032](https://www.whatech.com/og/markets-research/energy/789817-nuclear-waste-management-market-to-observe-strong-development-by-2032), 13 March 2024.

USA

SHINE Technologies Selects Deep Isolation Technology for High-Level Waste

US-based nuclear waste storage and disposal company Deep Isolation has been selected by SHINE Technologies as its preferred solution for storage and disposal of the high-level waste (HLW) that will remain as a residue after deployment of SHINE's technology for recycling used nuclear fuel (UNF). The two companies signed a MoU to jointly drive forward used fuel recycling supported by a safe and scalable solution for the resulting waste streams.

SHINE and Deep Isolation will collaborate and exchange critical information for the use of Deep Isolation's Universal Canister System (UCS) and patented directional drilling solution for deep borehole disposal for HLW isolation and management.

A joint study by the two companies in 2023 looked at the feasibility and costs of disposing 100% of the HLW remaining from SHINE's pilot

A joint study by the two companies in 2023 looked at the feasibility and costs of disposing 100% of the HLW remaining from SHINE's pilot reprocessing facility by encapsulating the waste in the UCS and emplacing in deep boreholes. The study concluded that SHINE's recycling process reduced the HLW volume by more than 90% compared with the original UNF volume, and that Deep Isolation's solution is technically and economically viable for the remaining waste.

reprocessing facility by encapsulating the waste in the UCS and emplacing in deep boreholes. The study concluded that SHINE's recycling process reduced the HLW volume by more than 90% compared with the original UNF volume, and that Deep Isolation's solution is technically and economically viable for the remaining waste. The study also identified areas where further technical work could optimise Deep Isolation's technology for the remaining waste, reducing disposal costs even further.

SHINE founder & CEO Greg Piefer said the approximately 90,000 tonnes of civilian used nuclear fuel across the US represents an untapped and arguably renewable resource that if recycled will reduce emissions and accelerate the deployment of carbon free fission energy....

In February, SHINE and Orano USA signed agreed to cooperate on the development of a US pilot plant with commercial-scale technology for recycling used nuclear fuel from light water reactors. Site selection for the pilot facility is expected by the end of this year. The pilot plant concept – expected to recycle 100 tonnes a year of used nuclear fuel, extracting 99% of usable uranium and plutonium – will validate commercial-scale aqueous recycling with integrated non-proliferation measures. The system is based on

SHINE's separation technology and Orano's methods in operation at its La Hague facility in France.

Source: <https://www.neimagazine.com/news/newsshine-technologies-selects-deep-isolation-technology-for-high-level-waste-11597404>, 13 March 2024.

USA–GERMANY

GNS and Energy Solutions Team Up for Asian Market

Energy Solutions of the USA and Germany's GNS Gesellschaft für Nuklear-Service mbH have signed a memorandum of understanding on the transport and disposal of large components from the future dismantling of Asian nuclear power plants. The objective of the cooperation is the disposal of large components from decommissioned Asian nuclear power plants by EnergySolutions in the USA. German radioactive waste specialist GNS enables the transport with its worldwide unique know-how in the packaging and qualification of the components. ...

Source: <https://www.world-nuclear-news.org/Articles/GNS-and-EnergySolutions-team-up-for-Asian-market>, 18 March 2024.



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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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