



OPINION – Isabel Bosman, Keanen Isaacs

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The Future of SA Nuclear Energy Post-123 Agreement

The plant at Koeberg is the only current nuclear power station in Africa and is responsible for roughly 6% of South Africa’s total electricity production. More than one year has passed since the expiry of the Agreement for Cooperation between the US and South Africa Concerning the Peaceful Uses of Nuclear Energy (the 123 Agreement). With its expiration, the export license of Westinghouse Electric Corporation, a key nuclear fuel supplier to South Africa, was also suspended. This added to existing uncertainties about the future of the country’s Koeberg Nuclear Power Plant and the alleviation of loadshedding (rolling blackouts) typically attributed to South Africa’s fleet of ageing coal power plants. Loadshedding was additionally complicated last year due to ongoing interventions at Koeberg NPP to extend its operating life beyond the 40 years for which it was designed. According to statistics published by The Outlier, loadshedding in 2023 amounted to 6 947 hours.

The plant at Koeberg is the only current nuclear power station in Africa and is responsible for roughly 6% of South Africa’s total electricity production. It consists of two pressurised water reactors (each contributing some 920 MW to the grid) in operation since 1984 and was built by French company Framatome following an agreement between South Africa and France in 1976.

So-called 123 Agreements...allow the transfer of nuclear material from the US to other countries through formal agreements conditional to

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safeguards and security requirements. The plant at Koeberg is the only current nuclear power station in Africa and is responsible for roughly 6% of South Africa’s total electricity production. It consists of two pressurised water reactors (each contributing some 920 MW to the grid) in operation since 1984 and was built by French company Framatome

following an agreement between South Africa and France in 1976. South Africa’s power utility, Eskom, has been actively engaged in extending its operational life

beyond 2024 to 2045, plans which have been delayed at various stages of this intervention. With the ongoing problems in electricity supply shortage, the country can hardly afford to lose the nearly 2000 MW provided by the Koeberg NPP.

One of the most important processes of this extension involves the replacement of the reactors' steam generators, vital components to turn turbines to produce electricity. Unit 1 was taken offline in December 2022 to start the process. Replacement should have been completed by June 2023 so that the reactor could be brought back online, but the process was repeatedly delayed and at times the date of return to the grid of Unit 1 was unclear. However, on 30 December 2023 Unit 1 passed a critical test and has been cleared to resume operation. Repeated delays in the upgrade of Unit 1 pushed the replacement of the steam generator of Unit 2 back but with upgrades to Unit 1 completed, attention has now shifted to Unit 2. The reactor was taken offline on 11 December 2023 and is expected to remain so until September 2024. Renewal of Eskom's license to operate the NPP, which expires on 21 July 2024, depends on these critical upgrades. And with Unit 1 scheduled for another 200-day maintenance cycle, time is of the essence. While it is not envisaged, the already strained power grid will not benefit from both units potentially being offline at the same time, a condition South Africa's Minister of Electricity, Dr **Kgosientsho Ramokgopa**, also raised previously raised concerns about.

Although the 123 Agreement between the US and South Africa lapsed in 2022, this suspension has not caused a significant problem for the most recent round of refuelling at the NPP, but it could cause difficulties going forward. Negotiations for a new agreement, set in motion by both the US

and South African governments, have however reached a deadlock seemingly due to South Africa's insistence on its right to produce its own nuclear fuel. Indeed, this right is provided for in the NPT, of which South Africa is a party, as well as the continent's Treaty of Pelindaba, establishing a nuclear-weapon-free zone in Africa. With the expiration of the 123 Agreement, exports cannot take place since its safety requirements are also deemed invalid. However, the country's commitment to non-proliferation and the peaceful use of nuclear energy is still guided by the safeguards stipulated through the other legal regimes, like the NPT and Pelindaba Treaty, to which it adheres. That, along with the fact that South Africa voluntarily dismantled its

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former nuclear weapons programme and now champions nuclear disarmament globally, should be enough assurance.

After the Russia-Africa summit in July 2023 it was announced that the South African Nuclear Energy Corporation (Necsa) had signed a Memorandum of Understanding on cooperation for nuclear fuel and components manufacture with Russia's TVEL, the fuel section of Rosatom, its atomic energy agency. What this means for the renewal of the 123 Agreement with the US is not clear. South Africa has on several occasions come under scrutiny for its relationship with Russia since the outbreak of war in Ukraine. Its decision to host a joint military exercise with Russia over the one-year anniversary of the war as well as allegations by the US of an arms shipment to Russia (the famous Lady R incident) have sparked some of the biggest questions. Its decision to sign a nuclear fuel agreement with Russia may well be viewed with scepticism by the international community.

Building additional nuclear power plants has also

been a consideration in South Africa, however, not without controversy. Certainly, the most widely known incident involves the nuclear deal with Russia during the presidency of **Jacob Zuma**, declared unconstitutional after a legal challenge by Earthlife Africa and the Southern African Faith Communities Environment Institute (SAFCEI). In this court battle, Earthlife and SAFCEI wanted the nuclear agreement with Russia as well as the presentation to Parliament of nuclear agreements with South Korea and the US in 2015, declared invalid. Corruption allegations directed at government at the time also contributed to bringing down the nuclear expansion plans. Controversy aside, nuclear energy remains on the cards for South Africa. Indeed, on 12 December 2023 it was announced that the country plans to procure an additional 2500 MW of nuclear power to address the loadshedding problem. However, this is not a short-term solution, and the procurement and construction process will take at least a decade.

It remains to be seen whether the Koeberg life extension will be conducted successfully. But it is unlikely that failure to extend its operating life will mean the end of the road for nuclear energy in South Africa. With plans for nuclear expansion now made public, political will and committed follow-through from government will be the key to successfully navigating the mammoth task that is building a nuclear power plant.

Source: <https://www.polity.org.za/article/the-future-of-sa-nuclear-energy-post-123-agreement-2024-01-12>, 13 January 2024.

OPINION – Jacob Nagel, Andrea Stricker

Israel Must Remove Iran's Nuclear Insurance Policy

There is now an understanding that in the post-October 7 realities that Israel must face, there is

an imperative to deprive Iran of using its insurance policy as a shield. If the Islamic Republic of Iran decides to dash to a nuclear weapon, it will likely activate Tehran's formidable insurance policy, the terrorist group Hezbollah, to open another front in Israel's war and distract Jerusalem. This is the assessment of the Israeli government.

As the regime breaks out, Iran will almost certainly direct Hezbollah to assault Israel with some 150,000 to 200,000 rockets, missiles, drones, and projectiles it has stockpiled, many of them

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precision-guided-munitions (PGMs), all underwritten by Iran's generous funding and technology transfers. As of this writing, 50,000 to 100,000 Hezbollah terrorists are comfortably ensconced in southern Lebanon. Their forces have launched thousands of rockets, missiles, and drones at northern Israel since Hamas'

October 7th attack. Hezbollah's goals: avert Israel's focus on Gaza, drain precious military resources, and impose costs for Jerusalem's decimation of Hamas, also a well-funded Iranian proxy.

Israel has evacuated its northern communities due to Hezbollah's fire, with some 80,000 people now internally displaced. Hezbollah's attacks are only becoming more brazen. Last week's assault on a strategic Israeli air force base near Zefat is a case in point. Jerusalem's patience is wearing thin.

Of course, Israel is currently focused on eliminating Hamas and its leaders in Gaza and bringing home all kidnapped civilians and soldiers. However, there is an understanding in Israel that sooner or later, the Israeli Defence Forces (IDF) must confront Hezbollah's threat in Lebanon. Only after that has been accomplished, even partially, will the evacuated citizens be able to come back to their homes. But this is not just about the residents of the north. There is now an understanding that in the post-October 7 realities that Israel must face, there is an imperative to deprive Iran of using its insurance policy as a shield to acquire the ultimate deterrent weapon.

Iran's Nuclear Clock is Ticking: Iran's nuclear clock is ticking, and Israelis are keenly aware. Thankfully, although Tehran's incentive and capacity to sprint to nuclear weapons increases daily, it still lacks enough enriched uranium to create a formidable nuclear arsenal. But according to the latest data reported by the IAEA, Iran is very close (weeks) to producing the nuclear fuel needed for up to 12 nuclear weapons. The regime will likely require an additional 18-24 months to weaponize the material for operational nuclear devices and mount them on delivery vehicles. However, once Tehran moves enough weapons-grade enriched uranium to a secret underground site, Israel (and perhaps the US) would find it very difficult to act militarily and stop the effort.

This could be part of Supreme Leader Ali Khamenei's plan. Iran could be wielding its proxies, Hamas, Hezbollah, the Houthis, and Shiite militias in Iraq and Syria, to sow chaos in order to enable the regime to conduct a breakout. By the time the world notices and responds, Tehran might already have concealed enough enriched uranium and could be on the verge of an atomic bomb.

The moment Israel responds to this is the moment that Hezbollah is likely to launch an all-out war. That is why a widening group of Israeli officials believe that they must act soon. Israel must degrade the Hezbollah breakout shield before the regime acquires enough enriched uranium and secretly perfects its ability to weaponize.

The timing is not ideal now for an Israeli pre-emptive strike against Hezbollah in Lebanon. Both sides are on full alert. America and France are warning both sides to stand down while they attempt to broker a political agreement that would lead to Hezbollah abiding by UN Security Council

Resolution 1701 and move away from Israel's border.

If an agreement can be reached whereby Hezbollah and its elite Radwan forces move north, limiting their capability to attack the Israeli villages with anti-tank missiles and constraining their ability to strike Israeli bases and towns, Jerusalem could postpone its immediate attack plans. But make no mistake: Israel would still hone its plans for the near future. That future battle would include targeting Radwan forces and remaining bases and intelligence posts, near the Israeli northern border and deeper inside Lebanon. It would also include an assault on Hezbollah's long-range PGM's and production facilities, the command and control centres in Beirut, and the terror organization's leaders.

The attack of October 7th taught Israel that it has no other choice but to confront Iran-backed terror threats, sooner or later. Israel can no longer allow terrorists to encircle it in a ring of fire. Israel knows that it must also prevent Iran from obtaining nuclear weapons that would threaten Israel's very existence. Because Hezbollah is the regime's most powerful proxy, it is now seen as Tehran's insurance policy during a breakout. After a breakout, the regime's nuclear weapons would serve as an insurance policy for Hezbollah.

The Gaza war continues, and it is still Israel's main concern and centre. But another war beckons. Jerusalem must fulfil its commitment to protect its citizens. The IDF will soon have to act against Hezbollah. After that, there is an inevitable clash with Iran.

Source: <https://www.jpost.com/opinion/article-782163>, 16 January 2024.

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OPINION – Tom Patterson

Biden Inexplicably Helps Iran to Achieve Nuclear Arms

The Iranian mullahs must be thrilled at the progress they are making in obtaining nuclear capability. It represents the realization of their millennia-old ambition to turn the world into an Islamic caliphate. The world should be thoroughly alarmed. The West seemingly insists on not paying much attention, but observant Muslims, which is most of them, make no bones about it. It is a tenet of the faith that eventually, all non-Muslims will convert, die, or live in subjugation to Muslims. It is the duty of all faithful Muslims to devote their life to jihad, i.e., striving to bring about that day when sharia law rules the world.

Islam's lack of success so far is mostly because they lack the infrastructure necessary to support such a sustained, massive effort. Like the Soviet communists, their ideology creates the economic conditions that make advancing their cause difficult. The mullahs blame us, chanting "Death to America" and meaning it.

Until now, nations that have attained nuclear capability, starting with the United States, have at least to some degree recognized the awesome responsibility of having weapons so massively destructive that their deployment could set off a conflagration-ending civilization as we know it. The greatest threat ever may be that fanatical Muslims, who have no respect for human life or even their own people and who despise the values of Western civilization, will obtain nuclear capability.

So, faced with such obvious mortal danger, America's leaders are doing everything they can to prevent Iran from getting the bomb, right?

Almost unbelievably, President Biden is still working to relax the enforcement of sanctions and to provide enabling funds to Iran.

This glaring error goes back to 2015 and Barack Obama's belief that a policy of appeasement, rather than confrontation, was the best way to make an ally of the world's leading state sponsor of terrorism. For Obama and his advisors, negotiating the Joint Comprehensive Plan of Action (the "nuclear deal") was also the way to right our past injustices to Iran. "I do think you have to have the capacity to put yourself occasionally in their shoes," Obama said, always willing to stick up for Muslims while deeming America just another nation with nothing especially remarkable about it.

Obama's plan to produce an equilibrium of forces and, thus, stability in the Middle East by increasing Iran's access to resources and its standing in the Middle East was an unqualified failure. Lifting sanctions, terminating Justice Department operations against Iran, and requiring the Defence Department to work cooperatively with a sworn enemy craving nuclear capability predictably produced the opposite – more terrorism, more nuclear development, and more hostility to the US.

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Still, the American Left offered yet more support for Iran despite the fact that under the nuclear deal, we moved ever closer to facing a belligerent, nuclear-armed, and irrational enemy. Reversing Trump was all that mattered.

In 2022, Iran faced severe internal disruption due to its brutal treatment of women under sharia law. But instead of supporting the uprising or even letting it play out, the White House offered sanctions relief to prop up Iran's Revolutionary Guard. It slipped a note to Iran's government to

assure them we still supported the nuclear deal.

In 2023, the Obama/Biden team stubbornly continued to do about everything possible to subsidize Iran's nuclear ambitions, including: releasing \$20 billion from the International Monetary Fund, using a sanctions waiver to allow Iran to move \$10 billion out of Iraq, ending sanctions on oil sales, which produce \$30 million of annual revenue for Iran, releasing \$6 billion in oil revenue from South Korea.

Even the October 7 massacre and over 100 continued attacks on American military installations didn't stop Biden from allowing the UN missile embargo on Iran to expire. Plus, just to show there were no hard feelings apparently about attacking our ships in the Red Sea, we granted a waiver to allow Iran to access \$10 billion more from Iraq. Why do our leaders insist on enabling Iran's nuclear dreams and subsidizing terror? Do they honestly believe we can achieve peace through weakness? This isn't partisan bickering. Our bumbler-in-chief has put America in a very dangerous position.

Source: <https://townhall.com/columnists/tom-patterson/2024/01/19/biden-inexplicably-helps-iran-to-achieve-nuclear-arms-n2633863>, 20 January 2024.

OPINION – Sarah Bidgood

Preparing for the Uncertain Future of U.S.-Russia Arms Control: A Food for Thought

Despite their intense rivalry, Washington and Moscow have a long history of successful cooperation to reduce the threats posed by nuclear weapons. Over the course of five decades starting in 1963, they negotiated and implemented more than a dozen measures designed to halt the arms race, ranging from legally binding arms reduction treaties with intrusive verification protocols (e.g., the 1987 INF

to voluntary unilateral steps that the two sides took in parallel (e.g., the 1991-1992 Presidential Nuclear Initiatives). While the extent of this engagement ebbed and flowed over time, it persisted during some of the most difficult moments of the Cold War. Beyond driving a significant reduction in both sides' strategic and tactical nuclear arsenals, the results lent a degree of stability and transparency to their relationship that helped to lower the risk of escalation and slow the pace of the arms race.

This robust history of competitive cooperation between the first and largest nuclear weapon states contrasts sharply, however, with the present. The Trump administration's 2019 withdrawal from the INF treaty on the grounds that Russia failed to comply with its obligations left just one strategic arms control agreement in place between Washington and Moscow: the 2010 New START. Just two years later in 2021, this agreement was nearly allowed to expire with no follow-on to succeed or replace it.

While this outcome was ultimately averted thanks to a last-minute extension of the accord, Russia's 2022 invasion of Ukraine and corresponding break with the West have once again rendered the treaty's future far from certain.

Indeed, in part because of the alleged difficulties that Russian inspectors faced in entering U.S. airspace, Moscow announced in August 2022 that it would prohibit on-site inspections of its nuclear weapons facilities that are subject to verification under New START. Subsequently, in February 2023, Russian President Vladimir Putin indicated in his annual address before the Russian Federal Assembly that he would suspend his country's participation in the agreement. In response, US National Security Advisor Jake Sullivan indicated the following June that the United States was halting its "day-to-day notifications to Russia that are required under that

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treaty”—a move designed, per the US Department of State, to “encourage the Russian Federation to return to compliance” with its obligations. While Russia’s Ministry of Foreign Affairs has outlined some conditions under which this might occur, they appear to be predicated on a change in US position with respect to supporting Ukraine—an outcome that appears highly unlikely in the foreseeable future.

The future of bilateral arms control beyond New START looks no more promising, at least as long as the war rages on. Indeed, the US-Russia Strategic Stability dialogue process, which was initiated in June 2021 to “lay the groundwork for future arms control and risk reduction measures” has been on ice since February 25, 2022, with no indications of if or when it might resume. While Sullivan reiterated recently that the United States was ready to “engage Russia now to manage nuclear risks and develop a post-2026 arms control agenda,” Russian Deputy Foreign Minister Sergey Ryabkov claims that no further clarifications or additions from Washington followed from this overture. Instead, he described the current state of arms control dialogue with the Americans as “extremely sporadic and unsystematic” (translation mine) a characterization that does not augur well for negotiations in the near term.

These developments, while not unexpected, come at an inopportune time for the international security environment. Advanced conventional weapons are ushering in what Andrew Futter and Benjamin Zala call a “third nuclear age,” the taboo against the non-use of nuclear weapons appears

Advanced conventional weapons are ushering in what Andrew Futter and Benjamin Zala call a “third nuclear age,” the taboo against the non-use of nuclear weapons appears to be eroding, and the United States, Russia, and China are all in the process of modernizing their strategic forces. Managing these challenges and others will require more than just a return to the status quo ante when it comes to arms control.

to be eroding, and the United States, Russia, and China are all in the process of modernizing their strategic forces. Managing these challenges and others will require more than just a return to the status quo ante when it comes to arms control. Instead, it will take innovative, creative, and collaborative solutions to address these multi-player

and multi-domain threats effectively.

While identifying and implementing such solutions is possible, it is as yet unclear when there might be sufficient political will to do so. Particularly against the backdrop of Russia’s brutal war and in an environment of renewed great power competition, those voices on both sides calling for a more credible deterrent supported by more tools for so-called escalation dominance may prove louder than those calling for restraint. This outcome could pave the way for a resurgence of arms racing and increased crisis instability. What

What is more, as the aftermath of past nuclear crises suggest, the mistrust and mutual acrimony that currently characterize the US-Russian relationship make it less likely that officials in either Washington or Moscow will be prepared to show the kinds of flexibility necessary to reach new agreements—even if a return to the negotiating table is possible.

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even if a return to the negotiating table is possible. It remains unclear when or under what circumstances these emotions will dissipate sufficiently for productive discussions to resume.

Against this backdrop, the focus for both practitioners and scholars in the near term should be on shoring up what remains of the arms control architecture and preparing for more ambitious steps that can be implemented when the time is right. While these are two discrete tasks that

require different approaches, they are mutually reinforcing in the sense that—as the historical record shows—cooperation in one area of nuclear diplomacy can beget further cooperation in others. Both tasks will be more likely to yield results if arms control is understood to mean something more than just the legally binding strategic arms reduction treaties that emerged from the 1980s and 1990s, however. Instead, following Thomas Schelling and Morton

Instead, following Thomas Schelling and Morton Halperin, these efforts should take into account “...all the forms of military cooperation between potential enemies in the interest of reducing the likelihood of war, its scope and violence if it occurs, and the political and economic costs of being prepared for it.”

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A useful first step in this regard would be to conduct a thorough review of past cases of US-Soviet/Russian arms control cooperation and the conditions that contributed to their success. One valuable output from this exercise would be a comprehensive catalogue of existing, but lesser-known, measures to which the two sides could recommit now when the

Yet another benefit of this exercise is that it would shed light on the ways that past generations of arms controllers have grappled with emerging technologies and novel weapons over time. A useful example in this regard is the history of U.S. and Soviet attempts to conclude a convention prohibiting the development, production, stockpiling, and use of radiological weapons beginning in the 1970s.

future of New START is uncertain and further agreements appear to be out of reach. A salient example in this regard is the 1973 Agreement on the Prevention of Nuclear War, which obligates the United States and Russia sides to engage in urgent consultations if it appears that nuclear use is imminent. Implementing the key provisions of this agreement which remains in force today could help to reduce the risk of escalation at a time when this is urgently needed.

Another benefit of this exercise is that it would

afford experts and practitioners more granular insights into the circumstances under which arms control negotiations between Washington and Moscow succeed and fail. Earlier analyses of US-Soviet non-proliferation cooperation have revealed, for instance, that personal relationships between negotiators; institutional advocates for joint work; and a focus on technical rather than political issues all helped to sustain bilateral nuclear engagement at difficult moments in the past. A comparative analysis

of other examples of US-Soviet/Russia arms control could similarly point to additional factors that would facilitate further cooperation, as well as pitfalls to avoid. The results would inform efforts to lay the groundwork for future arms control progress if and when the geopolitical environment becomes more conducive.

Yet another benefit of this exercise is that it would shed light on the ways that past generations of arms controllers have grappled with emerging technologies and novel weapons over time. A useful example in this regard is the history of U.S. and Soviet attempts to conclude a convention prohibiting the development, production, stockpiling, and use of

radiological weapons beginning in the 1970s. The contours of this case reinforce the importance of adopting precise definitions in establishing new limits on military technology, of delinking arms control negotiations that are ongoing simultaneously, and when it comes to multilateral agreements of providing clear arguments in favour of limits that all key players find compelling. While the military and dual-use technologies with which the international community is currently contending have changed, the insights revealed by historical case studies like these may nevertheless prove

useful for addressing the challenges they present when the time is right.

An important driver behind successful arms control cooperation to which the historical record also points is the alignment of perceived threats and interests between negotiating parties. With this in mind, another way that experts and practitioners could lay the groundwork for future arms control success would be to explore by means of a parallel risk assessment what the United States, Russia, and perhaps China regard as the most destabilizing emerging technologies and probable pathways to nuclear use. While this type of exercise would be both more useful, and more difficult, to conduct at a Track 1/1.5 level possibly as part of the P5 process valuable insights could nevertheless be gleaned from Track 2 discussions involving individuals with insight into the perceived threats of these three governments. A comparison of the results could reveal areas of overlap and divergence in their views, which could usefully inform both bi- and multilateral arms control negotiations in the future.

Depending on how long it takes for talks to get underway, however, there is a real possibility that few in either the US or Russian governments at that time will have any first-hand experience negotiating or implementing arms control treaties on which to draw. The likelihood of this happening will only increase the longer that participation in New START remains suspended. With this in mind, initiating

more activities aimed at nurturing a diverse next generation of arms control experts including through the transfer of knowledge from seasoned practitioners to newer entrants by means of meetings and events, oral history projects, and activities like arms control simulations would constitute a major contribution to international security that can and should be pursued today. While this is, admittedly, a long-term game, there is little point in implementing the other measures identified here if there is no one to operationalize them when the time is right.

Source: <https://global.upenn.edu/perry-world>

house/news/preparing-uncertain-future-us-russia-arms-control-food-thought-paper, 23 January 2024.

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NUCLEAR STRATEGY

RUSSIA

Russia Rejects US Arms Control Talks for Now, Citing Ukraine

Russia on January 18 publicly rejected U.S.-Russian arms control talks for now because of U.S. support for Ukraine, a stance Washington said cast doubt on Moscow's openness to a successor to the last treaty limiting their strategic nuclear arsenals. Russian Foreign Minister Sergei Lavrov told reporters that Washington had proposed separating the issues of Ukraine, which Russia invaded in 2022, sparking a nearly two-year war, and the resumption of "strategic stability" talks on arms control.

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resumption of “strategic stability” talks on arms control.

But Lavrov said the U.S. proposal was unacceptable to Russia because of the West’s backing for Ukraine and accused the West of conducting a “hybrid war” against Moscow. However, he did not rule out the possibility of future arms control talks between the two, which possess the world’s largest nuclear arsenals.... In Washington, a senior White House official said Russia may change its mind as the February 2026 expiration of the New START treaty approaches, though he said there were no guarantees. The treaty limits deployed strategic nuclear arsenals of both nations.... New START’s lapse would leave the two nations with no nuclear arms agreement at a time when tensions between them are at the highest point since the Cuban missile crisis of 1962.

Lavrov accused the West of pushing Ukraine to use increasingly long-range weapons for strikes deep inside Russia. Such strikes have intensified in recent weeks, including an attack on the southern city of Belgorod that killed 25 people on Dec. 30. Lavrov did not provide evidence for his assertion that the West was encouraging Ukraine to carry out such strikes but accused the United States of seeking military superiority over Russia. ...

Source: <https://www.reuters.com/world/russia-says-it-wont-discuss-nuclear-arms-control-with-us-while-it-backs-ukraine-2024-01-18/>, 19 January 2024.

UK

The government on 11th January announced plans for the biggest expansion of nuclear power in 70 years to bolster the UK’s energy independence, reducing electricity bills and supporting thousands of jobs. The Civil Nuclear Roadmap details plans to quadruple the UK’s nuclear generation to 24

gigawatts by 2050, which would cover a quarter of the country’s electricity needs. The government has unveiled several proposals to help achieve this target. For example, plans are underway for the construction of a GW-scale power plant as big as Sizewell C in Suffolk or Hinkley C in Somerset, which can power up to six million homes each.

The government will also invest £300 million into the domestic production of HALEU, the fuel required to power high-tech nuclear reactors, making the UK the first European country to have a high-tech nuclear fuel programme. There are plans for a new production hub in the North West

The government will also invest £300 million into the domestic production of HALEU, the fuel required to power high-tech nuclear reactors, making the UK the first European country to have a high-tech nuclear fuel programme. There are plans for a new production hub in the North West to be operational from early next decade. The roadmap also includes a government ambition to secure 3-7GW worth of investment decisions on new nuclear projects every 5 years between 2030 and 2044.

to be operational from early next decade. The roadmap also includes a government ambition to secure 3-7GW worth of investment decisions on new nuclear projects every 5 years between 2030 and 2044. Analysis by the Nuclear Skills Strategy Group estimates that these ambitious targets will create 80,000 new jobs.... The new roadmap is a significant step towards the government’s target of decarbonising all sectors of

the UK economy and achieving net zero by 2050.

Source: <https://www.publicsectorexecutive.com/articles/uks-nuclear-launch-government-unveils-ambitious-roadmap-energy-security-and-growth>, 13 January 2024.

USA

U.S. Says Shift to Safer Nuclear Fuel Would Be Costly

The United States is making progress in developing a safer LEU fuel for use in Navy ships, but the project is very costly, and success is not assured, according to a report by the National Nuclear Security Administration (NNSA). The issue of nuclear fuel for navy ships has drawn increased attention since 2021, when the United States and

the United Kingdom agreed to sell nuclear-powered submarines to Australia. The United States now relies on highly enriched uranium to provide safe, long-lived, and reliable naval propulsion fuel. But non-proliferation experts have been urging a switch to LEU, which is more difficult to convert for use in nuclear weapons.

In a message accompanying the report, NNSA Administrator Jill Hruby said she was “pleased with the progress...made in this technically challenging effort...[because in] fiscal 2021, we reached a critical milestone” with experiments that will produce the first information evaluating novel fuel-fabrication techniques, as well as fuel performance characteristics. Nevertheless, the report struck a downbeat tone, concluding that “these initial activities are the first steps on a long, costly path to fuel development and success is not assured.”

It predicted a reactor fuel system design effort lasting 20 to 25 years that would cost more than \$1 billion and detract from higher-priority non-proliferation and naval propulsion research and development activities. The NNSA has been researching LEU fuel use in Navy systems since 2018 with \$50 million appropriated by Congress, but the program is now in doubt after a House subcommittee cut the funding, Reuters reported. The nuclear fuel issue has drawn increased attention since 2021, when the United States and the United Kingdom raised proliferation concerns by agreeing to sell nuclear-powered submarines

to Australia, which would become the first non-nuclear-weapon state to field a ship with an HEU-powered reactor.

Source: <https://www.armscontrol.org/act/2024-01/news/us-says-shift-safer-nuclear-fuel-costly>, 13 January 2024.

BALLISTIC MISSILE DEFENCE

IRAN

Iran Makes Range ‘Record’ by Launching New Ballistic Missile in Anger

Iran’s Islamic Revolution Guard Corps (IRGC) has reported that it has launched the nation’s furthest missile strike ever using a series of new MRBM. Called the “Kheibershekan,” which roughly translates to “castle buster,” the IRGC Aerospace Force has reported that its missiles were fired from the southern parts of *Khuzestan* Province towards belligerent targets in Syria and Iraq. The weapons were fired to combat alleged Iraqi Daesh and Israeli Mossad threats....

According to the official Iranian Tasnim news agency, Brigadier General Amir Ali Hajizadeh stated that the Islamic Revolutionary Guards Corps Aerospace Force (IRGC-AF) launched four “Kheibershekan” MRBMs from its facility located in the southern parts of

Iran’s *Khuzestan* Province. The missiles were launched on Monday and traveled about 800 miles (1,288 km). If true, this missile strike is considered the longest recorded.

On Monday, the IRGC-AF launched missiles from

The issue of nuclear fuel for navy ships has drawn increased attention since 2021, when the United States and the United Kingdom agreed to sell nuclear-powered submarines to Australia. The United States now relies on highly enriched uranium to provide safe, long-lived, and reliable naval propulsion fuel. But non-proliferation experts have been urging a switch to LEU, which is more difficult to convert for use in nuclear weapons.

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two different facilities in Iran. Four missiles were launched from the *Kermanshah* facility, while two were fired from the *West Azerbaijan* Province. It is unclear what type of missiles were used in the attacks, but *Kermanshah* is located approximately 200 miles (322 km) from *Erbil*, while *West Azerbaijan* Province is about 100 miles (161 km) away.... It was the first time that the “Kheibarshekan” MRBM was used in a military operation, and it was also the first time that Iran targeted two different territories in two different countries during the same attack. Additionally, this was the first missile launch from the IRGC-AF base in *Khuzestan* Province since the Iran-Iraq war.

The “Kheibarshekan” is a two-stage, solid-propellant, truck-launched MRBM that Iran unveiled on February 9, 2022. A third generation of the “Fateh” family of ballistic missiles, Iran claims it has a maximum range of 900 miles (1,450 km).

Source: <https://interestingengineering.com/military/iran-makes-range-record-ballistic-missile>, 18 January 2024.

NORTH KOREA

North Korea Fires Missile, Minister to Visit Russia as Tensions Rise

North Korea fired an apparent intermediate-range missile into the sea on Sunday, 14th January South Korea and Japan said, as tensions run high after Pyongyang’s recent launches of an intercontinental ballistic missile and its first military spy satellite. North Korea has stepped up pressure on Seoul in recent weeks, declaring it the “principal enemy”, saying the North will never reunite with the South and vowing to enhance its ability to deliver a nuclear strike on the U.S. and America’s allies in the Pacific.

Sunday’s missile, launched from the area of Pyongyang around 2:55 p.m. (0555 GMT), flew about 1,000 km (600 miles) off the country’s east coast, South Korea’s military said in a statement, adding that Seoul was running an analysis on the missile in coordination with the U.S. and Japan. The maximum altitude was at least 50 km (30 miles), and the missile appeared to fall outside Japan’s exclusive economic zone, Japan’s defence ministry said, criticising the launch as a violation of United Nations resolutions.

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In November, North Korea said it successfully tested solid-fuel engines designed for intermediate-range ballistic missiles. In December it said it had tested its newest intercontinental ballistic missile to gauge the war

readiness of its nuclear force against what it called mounting U.S. hostility, as Washington and its allies began operating a real-time missile data-sharing system.

North Korean soldiers brought heavy weapons back to the Demilitarized Zone around the North-South border and restored guard posts that the two countries had demolished, after Seoul suspended part of a 2018 military accord between the two Koreas in a protest over Pyongyang’s launch of the spy satellite.

The U.S. and its allies have condemned what they describe as Russia’s firing of North Korean missiles at Ukraine, with Washington calling it abhorrent and Seoul calling Ukraine a test site for Pyongyang’s nuclear-capable missiles. Moscow and Pyongyang have denied conducting any arms deals but vowed last year to deepen military relations. The U.S. State Department on Thursday imposed sanctions on three Russian entities and one individual involved in the transfer and testing of North Korea’s ballistic missiles for Russia’s use against Ukraine.

Source: <https://asia.nikkei.com/Spotlight/N-Korea-at-crossroads/North-Korea-fires-missile-minister-to-visit-Russia-as-tensions-rise>, 15 January 2024.

UK

UK to Upgrade Warship Defence Missile System Used in Red Sea

Britain's Ministry of Defence said on Sunday, 22nd January, it would spend 405 million pounds (\$514 million) to upgrade a missile system now being used by the Royal Navy to shoot down hostile drones over the Red Sea. The Sea Viper Air Defence system will be upgraded with missiles featuring a new warhead and software enabling it to counter ballistic missile threats, the MoD said in a statement.

The contracts were awarded to the British division of MBDA, a missiles joint venture owned by Airbus. "As the situation in the Middle East worsens, it is vital that we adapt to keep the UK, our allies and partners safe," defence minister Grant Shapps said in the statement. "Sea Viper has been at the forefront of this, being the Navy's weapon of choice in the first shooting down of an aerial threat in more than 30 years." U.S. and British naval forces in the Red Sea have shot drones and missiles fired by Yemen's Houthi movement this month as the conflict between Israel and Hamas spilled out into the broader region.

Source: <https://www.reuters.com/world/uk/uk-upgrade-warship-defence-missile-system-used-red-sea-2024-01-21/>, 22 January 2024.

NUCLEAR ENERGY

ARMENIA

Armenian Prime Minister Confirms Country's Interest in New NPP and SMRs

Armenian Prime Minister Nikol Pashinyan visited the Nuclear Safety Regulatory Committee to discuss the agency's report on its activities for 2023. It was noted that measures are ongoing to increase the safety of the existing Armenian NPP, to fulfil the conditions and requirements of its operating licence.

The currently operating Armenian NPP (ANPP) at Metsamor was built in the 1970s with two Soviet-supplied VVER-440-V230 units, but was closed following a devastating earthquake in 1988. However, unit 2 was recommissioned with

Russian help in 1995 following severe energy shortages. In March 2014, the Armenian government decided to extend the plant's service life to 2026. Most of the overhaul (until 2019) was funded by an interstate loan from Russia. Construction of a new nuclear plant has long been part of Armenia's overall plan, although finance has proved to be an obstacle.

Referring to plans for a new nuclear unit, Pashinyan noted that the creation of an organisation for the implementation of the project had been discussed and emphasised the importance of providing a powerful personnel base. It is planned to build a new NPP within 8-10 years and various options are being investigated including technologies from Russia, the USA, and South Korea. The preliminary feasibility study for the construction of a new 1200 MWe unit from is under consideration.

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The Prime Minister was presented with a sequence of steps for analysis and further actions regarding the advisability of building a new NPP in Armenia, deploying SMRs, as well as choosing the necessary technologies

Source: <https://www.neimagazine.com/news/newsarmenian-prime-minister-confirms-countrys-interest-in-new-npp-and-smrs-11447511>, 20 January 2024.

CHINA

Chinese-Developed Nuclear-Powered Battery can Last 50 Years without Recharging

The BV100 is smaller than a coin and captures energy from radioactive decay of elements. Battery could enable devices like smartphones to operate indefinitely without recharging or drones to fly without landing. A company in China has developed a battery that it says can last longer than the devices it powers. The nuclear-powered BV100 is smaller than a coin and can provide power for 50 years without the need for recharging, according to Beijing-based start-up Betavolt Technology, the company behind the product.

The prototype battery harnesses energy released by nuclear isotopes and uses semiconductors to convert that energy into electrical power, the company said. "The battery could enable devices like smartphones to operate indefinitely without recharging or drones to fly without landing," the company said on its website. Aside from a lengthy lifespan, the battery is also said to perform well under extreme conditions. "Unlike traditional batteries, this nuclear battery operates safely under extreme conditions, from temperatures of 120 to minus 60 degrees Celsius (248 to minus 76 Fahrenheit), and is resistant to punctures and

gunfire without catching fire or exploding," Science and Technology Daily said in an article on January 8.

In addition to general civilian use, such a battery could be used in military applications like continuously flying drones, or for deep-sea monitoring devices that require long-term power supplies under extreme conditions, according to industry experts. The BV100 measures just 15 x 15 x 5mm (0.59 x 0.59 x 0.2 inches), with a power output of 100 microwatts and 3 volts. The company said it planned to mass-produce the battery by the end of this year and introduce a 1 watt version next year.... Unlike nuclear fission or fusion, nuclear decay is a spontaneous process in which isotopes emit radiation, leading to more stable new atoms. Scientists encapsulate these isotopes, converting the energy emitted into usable electrical power.

Source: <https://www.scmp.com/news/china/science/article/3248960/>

[chinese-developed-nuclear-powered-battery-can-last-50-years-without-recharging](https://www.scmp.com/news/china/science/article/3248960/), 17 January 2024.

DENMARK

Danish University to Create New Nuclear Research Centre

The Technical University of Denmark is establishing a new interdisciplinary centre that will consolidate and strengthen research in nuclear power technologies. Although research into nuclear power has been limited in Denmark over the past 40 years, The Technical University of Denmark (*Danmarks Tekniske Universitet*, DTU) has maintained several research environments that work with nuclear physics and nuclear technologies, thus maintaining professional expertise in the field.

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Under the leadership of Bent Lauritzen, a senior researcher at DTU Physics, the new centre - to be named DTU Nuclear Energy Technology - will strengthen the collaboration between relevant research environments, currently located at the departments of DTU Physics, DTU Energy, DTU Chemistry and DTU Construct.

DTU Nuclear Energy Technology will ensure that Denmark continues to have strong competencies in the field and cooperate with Danish and international companies working to develop new reactor types, the university said. The purpose of the new centre will be to: attract and support academic talent to strengthen research in nuclear energy technologies; expand capacities for teaching and supervision of students, including PhD students; create experimental facilities for such areas as characterisation of materials and simulation of new reactor technologies; and strengthen collaboration with Danish and international companies.

Denmark had three nuclear research reactors, which started up between 1957 and 1960, at the Risø National Laboratory north of Roskilde on the island of Zealand. DR-1, a 2kWt homogeneous unit from 1957, stopped operating in 2001 and was fully decommissioned in 2006. A 5 MWt pool reactor (DR-2) closed in 1975, and a 10 MWt heavy water reactor (DR-3) closed in 2000. Fuel fabrication facilities for DR-2 and DR-3 were closed in 2002.... In 1985, the Danish parliament passed a resolution that nuclear power plants would not be built in the country and there is currently no move to reverse this situation.

Source: <https://www.world-nuclear-news.org/Articles/Danish-university-to-create-new-nuclear-research-c>, 19 January 2024.

GENERAL

Global Survey Finds Figh Public Support for Nuclear

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world's largest publicly-released international study on what people think about nuclear energy", with data collected from more than 20,000 respondents from 20 countries.

"The PACE index was set up to track support/opposition for clean energy sources, what drives

The survey found that, across the 20 countries surveyed, 28% of respondents oppose the use of nuclear energy while 46% support it. Of the 20 countries surveyed, 17 have net support for nuclear energy's use. Support was found to be more than three times higher than opposition in the world's two most populated countries, China and India.

those attitudes, and how institutions can better cater to what the public wants," Radiant Energy said. The survey found that, across the 20 countries surveyed, 28% of respondents oppose the use of nuclear energy while 46% support it. Of the 20 countries surveyed, 17 have net support for nuclear energy's use. Support was found to be more than three times higher than opposition in the world's two most populated countries, China and India.

Preference for nuclear energy was found to be larger than for onshore wind, biomass from trees, or gas with carbon capture and storage. Twenty five percent of those surveyed said their country should focus on nuclear energy, behind only the 33% preference for large-scale solar farms. Nuclear is seen as the most reliable thermal source of energy, with 66% of respondents

saying nuclear is reliable. The survey found that people who view nuclear energy as reliable have over four times more support for its use.

for-nuclea, 20 January 2024.

UK

However more than half (53%) of respondents thought nuclear energy created a fair amount or a great deal of greenhouse gas emissions. The cost of nuclear is seen as low by more people than the cost of wind or solar in countries that have previously phased out nuclear's use. In Germany, Japan, South Korea and Sweden - countries that have had the largest politically-mandated nuclear phase-outs - nuclear energy is the most positively viewed technology for reducing energy bills.

Globally, 79% of respondents said they are concerned about nuclear safety. Within this group, a majority of 40% nonetheless support the use of nuclear energy while 33% oppose it. "While support/opposition metrics provide a view of public sentiment they are a bad proxy for how the public wants governments to act," Radiant Energy noted. "Within the group of respondents who say they tend to oppose nuclear energy's use, 54% do nonetheless support government policy to keep operating existing nuclear plants and 17% wish to build more nuclear plants."

Within nuclear-powered countries, more than three times more respondents want to keep using nuclear power than phase it out. Within the four countries without existing commercial reactors, twice as many respondents want to construct new nuclear power plants rather than ban their use....

Source: <https://www.world-nuclear-news.org/Articles/Global-survey-finds-high-public-support->

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By commencing formal construction, a GBP250 million (USD318 million) package of funding for the local community will become available in phases during the construction phase of the project. That funding includes GBP23 million for community projects, GBP100 million for the environment, GBP12 million to support local tourism, and a GBP12 million housing fund to boost private housing and tourist accommodation.

Sizewell C Project to Enter Construction Phase

The Sizewell C nuclear power plant project has been awarded a Development Consent Order (DCO), paving the way for formal construction work to begin at the site in Suffolk, UK. EDF Energy submitted a DCO for the plant in May 2020. The DCO - which is from the nuclear site licence application - is considered by the Planning Inspectorate, which determines if the overall proposed scheme is acceptable under national planning legislation. The project was granted permission by the Planning Inspectorate to build in July 2022. However, while preparatory works subsequently began, many obligations needed to be satisfied before construction could commence under its DCO....

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To ensure local people continue to have their say on the project during construction, new Sizewell C Forums have launched so that residents can discuss key issues with the project team. There are four main forums, chaired independently, covering all the main project-related topics

relevant to the community. Parish and town councils will represent the community at the forums, and local people can attend the meetings as observers.

In September 2023, the UK government, Sizewell C and EDF launched an equity raise process to attract private investors into the project. While triggering the DCO and entering the construction phase is not dependent on a final investment decision (FID), constructive discussions with qualified potential investors are continuing and an FID is expected later in 2024....The plan is for Sizewell C to feature two EPRs producing 3.2 GW of electricity, enough to power the equivalent of around six million homes. It would be a "replica" of the Hinkley Point C plant, under construction in Somerset....

Source: <https://www.world-nuclear-news.org/Articles/Sizewell-C-project-to-enter-construction-phase>, 16 January 2024.

UK Invests in New Neutron Facility

The UK's National Physical Laboratory (NPL) has announced plans for a new neutron measurement facility at its site in Teddington, south-west London. The new accelerator system will be six times as powerful as the one it is replacing.

NPL said the new facility "will play a critical role in the safe and secure operation and continued development of the UK's nuclear energy, defence and fusion research sectors". It will provide "all-important traceability in terms of established safety protocols and stringent regulatory compliance that ensures new-build reactors can help drive the rapid and safe expansion of nuclear power in the UK".

It noted that the new system allows the UK government to continue to "provide an enduring and resilient measurement infrastructure,

ensuring that measurements can always be made in the UK with integrity and consistency", as set out in the government's 2022 UK Measurement Strategy for the National Measurement System. The facility consists of a new particle accelerator and is one of only a few known facilities worldwide that offers precision traceable neutron standards.

The new accelerator system will be a 2.0 MV Coaxial VHC Tandetron manufactured by High Voltage Engineering Europa BV of the Netherlands, the same company that manufactured the current KN3000 Van de Graaff accelerator over 60 years ago.

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NPL said the upgraded neutron facility addresses a number of current, future and emerging needs in the nuclear sector, including: the characterisation of new instrumentation and detectors required to ensure the UK's nuclear infrastructure and future reactors operate safely and efficiently; providing the expertise and facilities to enable the characterisation of neutron diagnostics, neutronics benchmark and

validation experiments and nuclear cross section and decay-data measurement, to support the work at UK-based world-leading fusion research organisations and their supply chains; producing both monoenergetic and thermal neutron fields for UK Defence and Security; and the characterisation and calibration of new area survey instruments and personal dosimeter products to assure the safety of workers within the nuclear sector. The upgrade has been funded by the former Department for Business for Energy and Industrial Strategy (BEIS) PSRE Infrastructure Fund.

Last week, the British government launched a roadmap for reaching its ambition for the UK to have 24 GWe of nuclear generating capacity by 2050, representing about 25% of the country's projected electricity demand. The plans include

next steps for exploring a large-scale nuclear power plant as well as small modular reactors. The roadmap also includes a government ambition to secure 3–7 GW worth of investment decisions every five years from 2030 to 2044 on new nuclear projects.

Source: <https://www.world-nuclear-news.org/Articles/UK-invests-in-new-neutron-facility>, 18 January 2024.

UK Plans to Build Third New 3.2 GW Nuclear Plant

The third new-generation nuclear plant is part of the UK's 'biggest expansion of nuclear power for 70 years'. The United Kingdom government said it is considering a third new-generation nuclear plant with the same power capacity as the under-construction Hinkley C and the approved Sizewell C.

The third plant is part of the Civil Nuclear Roadmap announced by the Department of Energy Security and Net Zero (DESNZ) Thursday, which the agency said envisions "the biggest expansion of nuclear power for 70 years".

Hinkley C in the county of Somerset and Sizewell C in the county of Suffolk have a planned capacity of 3.2 gigawatts each, enough to power a combined 12 million homes according to the DESNZ. Both are being developed by France's state-owned EDF Energy Ltd. The roadmap has set a goal of three GW to seven GW of approved nuclear generation capacity every five years from 2030 to 2044.... The International Atomic Energy Agency says HALEU is only produced in the United States and Russia but only Russia has a commercial-scale production. 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 United Nations nuclear watchdog.

"HALEU fuel will enable smaller designs, longer operating cycles and increased efficiencies," said Olena Mykolaichuk, director of the Division of Nuclear Fuel Cycle and Waste Technology at the IAEA in an IAEA bulletin report September 2023.

The DESNZ explained in a statement Sunday announcing the HALEU investment, "Advanced modular reactors will play an important role in the UK's nuclear revival as, like small modular reactors, they are smaller, can be made in factories, and could transform how power stations are built by making construction faster and less expensive" On the regulatory side, the roadmap

will allow authorities to "assess projects while designs are finalized, and better join-up with overseas regulators assessing the same technology", the DESNZ said in Thursday's announcement.

However, opponents have raised concerns about the costs of nuclear energy and the potential danger posed.

A campaign group has also been formed against Sizewell C. Together Against Sizewell C alleges various risks including damage to the environment, job displacement in the long term and an increase in energy prices.

UK

UK Releases Roadmap to Quadruple Nuclear Energy Capacity

The British government has launched a roadmap for reaching its ambition for the UK to have 24 GWe of nuclear generating capacity by 2050, representing about 25% of the country's projected electricity demand. It said the Civil Nuclear Roadmap "outlines plans for the biggest expansion of nuclear power for 70 years to reduce electricity bills, support thousands of jobs and improve UK energy security - including exploring building a major new power station and investing in advanced nuclear fuel production".

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Nuclear's share of energy in the UK is currently about 16%, however all but one of its existing reactors are due to retire by 2030. The roadmap "will give industry certainty of the future direction of the UK's ambitious nuclear programme, on top of the government's historic commitment to Sizewell C and world-leading competition to develop small modular reactor (SMR) technology," the government said.

The plans include next steps for exploring a large-scale nuclear power plant as well as SMRs. The roadmap also includes a government ambition to secure 3–7 GW worth of investment decisions every five years from 2030 to 2044 on new nuclear projects.... Earlier this week, the government announced it will also invest up to GBP300 million (USD381 million) in UK production of high-assay low-enriched uranium (HALEU), which is currently only commercially produced in Russia. HALEU - uranium enriched to between 5% and 20% uranium-235 - will be used in the advanced nuclear fuel required for most of the next-generation reactor designs currently under development.

The government has also published two consultations, one on a new approach to siting future nuclear power plants and another on supporting the sector and encouraging private investment to roll out advanced nuclear projects. The proposals aim to "attract investment in the UK nuclear sector by empowering developers to find suitable sites rather than focusing on eight designated by government".

The roadmap says: "The coming years are expected to bring further clarity on the costs and

effectiveness of new nuclear technology. This may require us to re-evaluate some of our strategies and policies for the long term. To take account of these developments, we therefore intend to publish a Roadmap 'update' by the end of 2025."

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positive action now being taken to deliver on the commitments made by those countries that endorsed the net zero nuclear Ministerial Declaration to Triple Nuclear Energy at COP28. The UK was a founding government partner of our Net Zero Nuclear initiative and I welcome today's announcement."

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World Nuclear Association Director General Sama Bilbao y León added: "The UK government's roadmap to streamline the process of future nuclear development and quadruple nuclear energy in the UK by 2050 is a pragmatic example of the

Source: <https://www.world-nuclear-news.org/Articles/UK-releases-roadmap-to-quadruple-nuclear-energy-ca>, 12 January 2024.

USA

Utility Invests USD10 Million in Advanced Reactor Feasibility Study

Puget Sound Energy - the oldest and largest utility in Washington State - is contributing USD10 million towards the feasibility stage of Energy Northwest's programme to develop and deploy a next-generation nuclear energy facility. Energy Northwest has already determined that X-energy's Xe-100 advanced SMR is the most suitable design to meet the region's specific needs.

State policies requiring a "substantial increase" in clean electricity are leading utilities to evaluate potential sources of new clean energy generation, Energy Northwest said. New nuclear energy

technologies, such as advanced SMRs, are approaching commercial readiness and feature enhanced safety systems; simplified, standardised, and scalable designs; and the ability to both swiftly integrate with renewables and provide around-the-clock electricity without producing any greenhouse gas emissions, it added....

The Xe-100 SMR is an 80 MWe high-temperature gas cooled reactor which uses TRISO (tristructural isotropic) particle fuel. A joint development agreement signed in July between Energy Northwest and X-Energy Reactor Company envisages the deployment of up to 12 Xe-100 units at a site adjacent to the existing Columbia nuclear power plant, with the first module expected to be online by 2030.

Energy Northwest is a joint operating agency set up by the state legislature in 1957, with 28 public power member utilities serving more than 1.5 million customers. It owns and operates the region's only nuclear power plant, the Columbia Generating Station, as well as solar, hydroelectric and wind generating facilities and a battery energy storage system. Puget Sound Energy owns over 3500 MWe of generating capacity, including hydroelectric, wind and thermal plants. Washington is committed to making its electricity supply completely free of greenhouse gas emissions by 2045, under a law signed in 2019.

Source: <https://world-nuclear-news.org/Articles/Utility-invests-USD10-million-in-advanced-reactor>, 13 January 2024.

US Administration Signs Off on Federal Funding for Diablo Canyon

The US Administration has signed the credit award and payment agreement finalising the USD1.1

billion in credit payments awarded under the Civil Nuclear Credit (CNC) programme to help keep the Diablo Canyon nuclear power plant in operation.

The payments are through the Civil Nuclear Credit (CNC) programme, a USD6 billion strategic investment under the Bipartisan Infrastructure Law to help keep the USA's existing reactor fleet in operation.

The Pacific Gas and Electric Company (PG&E) plant was conditionally awarded the credit in November 2022.

"Preserving the nation's nuclear fleet is critical not only to reaching America's clean energy goals, but also to ensuring that homes and businesses across the country have reliable energy," said Maria Robinson, director of the US Department of Energy's Grid Deployment Office....

The payments will be made in instalments over four years of operation from 2023, with the amounts adjusted to reflect factors including the actual costs of keeping the two-unit plant in operation. The first payment, to be made in 2025, will be based on the operation of the plant in 2023 and 2024.

While nuclear power currently provides nearly 50% of the USA's carbon-

free electricity, shifting energy markets and other economic factors have resulted in the early closures/ of some 13 of the country's commercial reactors since 2012. The CNC programme - part of the Bipartisan Infrastructure Law signed by President Joe Biden in November 2021 - aims to address those challenges by allocating credits to "certified" reactors which can show that they are projected to close for economic reasons and that closure will lead to a rise in air pollutants and carbon emissions....

Source: <https://www.world-nuclear-news.org/Articles/US-Administration-signs-off-on-federal-funding-for>, 22 January 2024.

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California Lifts Ban on Nuclear Reactor Construction

California has made a significant move towards a cleaner and more sustainable energy future. With the lifting of a 36-year ban on the construction of new nuclear reactors, the state is set to accelerate its transition to emission-free nuclear power. The decision to lift the ban comes as part of California's efforts to combat climate change and reduce greenhouse gas emissions. By embracing nuclear energy, the state aims to diversify its energy sources and decrease its reliance on fossil fuels.

Governor John Smith expressed his support for the decision, stating, "This is a crucial step towards achieving our goals of a cleaner and greener California. Nuclear power has the potential to provide a reliable and sustainable source of energy, and we need to explore all possible options to combat climate change."

The lifting of the ban opens up new opportunities for the development of nuclear power plants in the state. It is expected to attract private investments and create job opportunities in the construction and operation of these facilities. Industry experts have also welcomed the decision, highlighting the benefits of nuclear energy. Dr. Jane Johnson, a nuclear physicist, stated, "Nuclear power is a proven technology that can generate large amounts of electricity without emitting greenhouse gases. It is a crucial tool in the fight against climate change and can provide a stable and constant energy supply."

However, the decision to lift the ban is not without

its critics. Environmental groups have raised concerns about the potential risks associated with nuclear power, including the disposal of radioactive waste and the possibility of accidents. They argue that the focus should be on renewable energy sources such as solar and wind power.

The lifting of the ban opens up new opportunities for the development of nuclear power plants in the state. It is expected to attract private investments and create job opportunities in the construction and operation of these facilities. Industry experts have also welcomed the decision, highlighting the benefits of nuclear energy.

Responding to these concerns, Governor Smith emphasized the need for stringent safety regulations and oversight. He stated, "We understand the concerns raised by environmental groups, and we are committed to

ensuring the safety and security of any nuclear power plants built in California. We will work closely with experts and regulators to address these concerns and mitigate any potential risks."

The lifting of the ban on nuclear reactor construction in California marks a significant milestone in the state's clean energy journey. It is a clear indication of the state's commitment to exploring all viable options to fight climate change and transition to a sustainable future. With the ban lifted, California is now poised to harness the potential of nuclear power, contributing to a more sustainable and low-carbon future.

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Source: <https://willcountygazette.com/stories/653767522-california-lifts-ban-on-nuclear-reactor-construction>, 20 January 2024.

US Researchers Develop Nuclear Reactor Digital Twin

US Researchers at the Idaho National Laboratory (INL) and Idaho State University (ISU) nuclear engineering students have jointly developed the world's first nuclear reactor digital twin, INL announced. It is a virtual replica of ISU's AGN-201 reactor. By modelling nuclear reactors, digital

twins allow researchers to understand how certain changes affect the entire system, without making an irreversible change to the physical reactor itself. Digital twins could save nuclear energy researchers time and money, especially as new, innovative reactors come online, INL noted.

The AGN-201 digital twin receives real-time data from the reactor and then uses machine learning to anticipate its performance. Using the digital twin, researchers can interact with the real reactor in mixed reality by monitoring data. According to INL, nuclear reactor digital twins may eventually allow operators to control the reactor remotely. "The benefits of a nuclear reactor digital twin are enormous," said Christopher Ritter, INL's Digital Engineering manager. "Digital twins provide a comprehensive understanding of nuclear fuel cycle facility operations, strengthening nuclear security and non-proliferation efforts."

Bringing the first digital twin of a nuclear reactor online required more than a dozen tests and significant tenacity and patience. The project began when INL digital engineer Ryan Stewart, an ISU alum, recommended using the AGN-201 reactor for some of the team's planned demonstrations. The reactor is an ideal test bed for this project because it is simple compared with commercial power reactors.

The AGN-201 reactor, which began operating in 1965, produces fewer than five watts of heat and requires no active cooling. The physical reactor has a simple and safe design intended to perform research activities and teach students the practical aspects of nuclear reactor operation. ISU students installed data acquisition equipment in the reactor and developed operation

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scenarios to test the reactor twin – gaining a unique opportunity to take part in cutting edge research. INL provided much of the digital engineering support, including data acquisition, cloud streaming, machine learning and mixed reality.

Source: <https://www.neimagazine.com/news/newsus-researchers-develop-nuclear-reactor-digital-twin-11426524>, 15 January 2024.

NUCLEAR COOPERATION

RUSSIA–EGYPT

Putin, Sisi Mark New Phase of Egypt's Russian-Built Nuclear Plant

President Putin and Egypt's Abdel Fattah al-Sisi on Tuesday inaugurated the construction of a new unit at Egypt's Dabaa nuclear power plant via video link, as Moscow moves ahead with its global nuclear ambitions.

The power plant is being built by the Russian state corporation Rosatom at a reported cost of \$30 billion, and will consist of four power units with a combined capacity of 4.8 gigawatts. The two presidents were opening

the construction of the fourth and final unit, according to Egyptian state media. "The cooperation between our two countries continues and is developing. Egypt is a close friend of ours and a strategic partner," Putin said.

Egypt, which faces increasing power demand from a population of a 105 million, is seeking to position itself as a regional energy hub that exports electricity to neighbouring countries, and to diversify its energy sources. Since Sisi became president in 2014 the country developed a surplus

capacity for electricity generation but has been grappling with power cuts since last summer after heatwaves drove up demand for cooling. Production of natural gas used for power generation has also been dipping, and Egypt resorted to burning more polluting fuel oil in some power stations as it tried to keep up LNG exports - an important source of scarce foreign currency. "Introducing nuclear energy to the energy mix...is crucial to meeting the growing demand for electrical energy," Sisi said. Moscow and Cairo signed an agreement in 2015 for Russia to build a nuclear power plant in Egypt, with Russia extending a loan to Egypt to cover the cost of construction. ...

Source: <https://www.reuters.com/business/energy/putin-sisi-mark-new-phase-egypts-russian-built-nuclear-plant-2024-01-23/>, 24 January 2024.

UK-FRANCE

Newcleo and Naarea Launch Gen-IV Partnership

France's Naarea and the UK-headquartered Newcleo have announced a strategic and industrial partnership designed "to support all players in their industrial, technological, scientific and regulatory development" of Generation IV fast neutron reactors. The companies say that the partnership will be open to others to join and said it will focus on key areas where there are common interests, such as gaining access to the used nuclear fuel from conventional nuclear reactors that their Gen-IV reactors are designed to use as part of their efforts to close the fuel cycle.

Other areas of cooperation are the development of a joint research and development platform for areas such as heat

exchangers and materials, and working together to unlock financing and funding for both the research and for the fuel cycle infrastructure that will be required. They also propose to cooperate on the industrial development front with regulators and on "providing access to scientific computing tools particularly for safety demonstrations, making test centre sites available for future prototypes and developing and implementing shared test facilities".

Newcleo is planning a 30 MWe lead-cooled fast neutron test reactor in France in 2030, with a 200 MWe first-of-a-kind

commercial unit planned for the UK in 2032. Naarea is developing a 40 MWe/80 MWt molten salt fast neutron reactor with a target of 2027 for a prototype and by 2030 for construction of a manufacturing facility and launch of series production....

Source: <https://www.world-nuclear-news.org/Articles/Newcleo-and-NAAREA-launch-Gen-IV-reactor-partnersh>, 17 January 2024.

URANIUM PRODUCTION

CANADA

Canadian Uranium Producers Shares Climb as World's Largest Producer Warns of Output Lower

Shares of Canadian uranium producers were higher Friday after NAC Kazatomprom, the world's largest producer of uranium, warned of production difficulties. Kazakhstan's state uranium company said difficulties in obtaining sulfuric acid, as well as delays in completing

construction works at newly developed deposits, mean reaching production targets for 2024 could

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be challenging.

Sulfuric acid is a critical component used to extract uranium. It's used primarily in conventional mines where, after a mill crushes and grinds the ore, the material is then leached in sulfuric acid tanks to dissolve the uranium oxides before extraction. Scotiabank analyst Orest Wowkodaw said in a report that the bank expects Kazakhstan to produce 60 million pounds of uranium in 2024 and 80 million pounds in 2025, representing, respectively, 39% and 41% of global primary supply....

Kazatomprom's 2025 production targets could also be challenged if supply don't improve throughout the year and if the company isn't able to meet its construction works timelines, the uranium producer said. Demand for uranium is up amid a global shift away from carbon-emitting fuels. Uranium prices have more than doubled over the last year, with current spot price sitting at \$97.45 a pound. If Kazakhstan's production falls, Canadian producers could benefit.

RUSSIA

Rosatom's mining division exceeded its uranium production target by 90 tonnes in 2023, it told its annual Stakeholder Dialogue event. Meanwhile, progress is being made on new mining operations. The Dialogue with Stakeholders saw Rosatom's mining division sum up preliminary production results of its activities in 2023.

At the Priargunskoye Industrial Mining and Chemical Union (PIMCU) - the uranium production centre in the Transbaikal/Chita region - heap leaching was used to increase the processing of low-grade ores, while the commissioning of a new treatment block at Mine No 8 supported stable, uninterrupted operation and maintaining

production volumes, the company said.

Meanwhile, development of Mine No 6, which will access the the Argunskoye and Zherlovoye deposits, is under way in accordance with the construction programme, the company said. All key works for 2023 were completed on time, and the first uranium from the mine is expected to be produced in 2028. Mine 6 "will become the main source of uranium production for the next 40-50 years", as further ore bodies are developed. These "will increase uranium production and guarantee the raw material independence of the Russian nuclear power industry, even taking into account the decrease in the resource base of mines No 1 and 8", Rosatom said in its *Atommedia Online* publication.

JSC Khiagda, the subsidiary responsible for in-situ leach (ISL) operations in the Republic of Buryatia, has started the construction of a local sorption unit at the Dybrynskoye orefield and commissioned the first stage of the Kolichkanskye field in December....

ARMZ is the management company of Rosatom's mining division. Its enterprises carry out the full range of uranium mining operations from geological exploration, pilot and design work to reclamation and decommissioning of production facilities. More than 60% of Russian uranium is mined using ISL. Rosatom's mining division is also actively developing its non-uranium businesses, and is implementing projects for the extraction of gold, lithium, rare and rare-earth metals. According to World Nuclear Association information, Russia produced 2508 tU in 2022, making it the sixth largest producer of uranium in the world, while Russian reactor requirements for

Sulfuric acid is a critical component used to extract uranium. It's used primarily in conventional mines where, after a mill crushes and grinds the ore, the material is then leached in sulfuric acid tanks to dissolve the uranium oxides before extraction.

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2023 were estimated at 6284 tU.

Source: <https://www.world-nuclear-news.org/Articles/Russian-2023-uranium-production-exceeds-target>, 24 January 2024.

USA

Uranium Energy (UEC) Restarting 100% Unhedged Uranium Production in Wyoming

Uranium Energy Corp, UEC announced that

the Company's Board of Directors has approved restarting uranium production at its fully permitted, and past producing, Christensen Ranch In-Situ Recovery ("ISR") operations in Wyoming. The recovered uranium will be processed at the fully operational Irigaray Central Processing Plant ("CPP") with a current licensed capacity of 2.5 million pounds U3O8 per year. The Irigaray CPP is the hub central to four fully permitted ISR projects in the Powder River Basin of Wyoming, including Christensen Ranch.

The first production is expected during August of this year and will be funded with existing cash on the Company's balance sheet. As UEC's strategy has been to remain 100% unhedged, produced uranium will be sold at prevailing spot market prices which was \$106 per pound U3O8 as of January 15, 2024 as reported by UxC.

In the coming months, the Company will provide additional information on the expected volumes for the first year of production. The key focus in the final pre-production phase before the August restart is hiring and training of additional operations personnel to augment UEC's experienced operations team to ensure a successful ramp-up of uranium

production. New personnel are anticipated to be hired from local communities such as Buffalo, Gillette, Casper, Kaycee and Wright.

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Amir Adnani, President and CEO stated: "This is the moment we have been working towards for over a decade, having acquired and further developed leading U.S. and Canadian assets with an exceptional, deeply experienced operations team. Uranium market fundamentals are the best the industry has

witnessed, and various supply shocks have accelerated the bull market with recent prices eclipsing the \$100 per pound level. With this exciting backdrop, we are pleased to announce our production restart in Wyoming."

Source: [https://www.streetinsider.com/Corporate+News/Uranium+Energy+\(UEC\)+Restarting+100%+Unhedged+Uranium+Production+in+Wyoming/22631643.html](https://www.streetinsider.com/Corporate+News/Uranium+Energy+(UEC)+Restarting+100%+Unhedged+Uranium+Production+in+Wyoming/22631643.html), 16 January 2024.

NUCLEAR DISARMAMENT

INDIA

India Assumes Presidency of Conference on Disarmament

India, which will hold the presidency for four weeks, succeeds Hungary and will be followed by Indonesia, Iran, Iraq, Ireland and Israel. India's Presidency takes place amidst major geopolitical stresses. Announcing the development on January 17, 2024, the Permanent Mission of India to the CD said the current focus of the organisation is on Nuclear Disarmament, FMCT, Outer Space, Negative Security Assurances, New WMDs, Radiological Weapons, and Transparency in Armaments.

In a significant development, India is set to take over as the Presidency at CD in January and February of 2024, a position that it last held 11 years ago. The CD is a central element in the disarmament machinery that negotiates arms control treaties. Established in 1979, it operates under the auspices of the United Nations and is based in Geneva, Switzerland. It has

65 militarily-significant nations as members.

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During a recent visit to India, United Nations High Representative and Under-Secretary-General for Disarmament Affairs Izumi Nakamitsu has had wide consultations with several senior Indian Government officials. The focus of these deliberations was India's forthcoming leadership role in the CD, an annual multilateral disarmament negotiating forum.

Her visit timed with her participation in the Global Technology Summit organized by Carnegie India at which she delivered a keynote address underlining an important nexus of AI.... The topics that were raised and discussed during the course of these meetings varied from that of subtleties associated with India's CD Presidency to larger concepts such as nuclear security, regional stability, and challenges of the emerging technologies.

A substantial role in the CD belongs to India, considering its historical promotion of disarmament. It was India that actually initiated the treaty to ban nuclear tests in the world and

voiced the cessation of materials' production used in producing nuclear weapons. India brings with it a long-standing commitment to disarmament and a nuanced understanding of new challenges posed by technological advancements.

Through this rotating presidency of four weeks by each of the members, the CD has played the central role in addressing vital issues like nuclear disarmament and prevention of nuclear war. India's upcoming presidency is testimony not only of its active participation in the forum but also signals a fresh focus towards managing the complexity of weapons of mass destruction in the AI era.

Source: <https://asianlite.com/2024/top-news/india-assumes-presidency-of-conference-on-disarmament/>, 19 January 2024.

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NUCLEAR PROLIFERATION

BELARUS

Belarus President Alexander Lukashenko has been pressing President Putin to return Soviet-era nuclear weapons to Belarus. The Belarusian government has drafted a new military doctrine that, for the first time, accounts for the usage of nuclear weapons. The new doctrine will reflect the rapid change in Belarusian strategic thinking in recent years that has seen Minsk push ally Moscow for the deployment of those weapons on soil.

Belarus Adds Nukes to its Military Doctrine

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Belarus last updated its military doctrine in 2016, with an eye on the risk of "hybrid war" and citing examples of Syria and Ukraine. In the time since,

relations between Minsk and the West, while never warm, declined precipitously, beginning first with Belarus' crackdown on domestic protests in 2020 and later with the Russian invasion of Ukraine. Simultaneously, U.S.-Russian arms control agreements have been unwound, raising the spectre of nuclear war.

On February 27, 2022, three days after Russia began its military operation in Ukraine, Belarusians went to the polls to vote in a new constitution that would approve the stationing of nuclear weapons on Belarusian territory. Lukashenko, whose authoritarian government's control ensured the vote would pass, was quoted as saying at a polling station, "If you transfer nuclear weapons to Poland or Lithuania, to our borders, then I will turn to Putin to return the nuclear weapons that I gave away without any conditions."

By mid-2023, Russia began delivering nuclear warheads to Belarus, reversing the decision made in the 1990s to remove nuclear weapons from the country. At independence, Belarus inherited a small nuclear arsenal from the Soviet Union, consisting of several dozen RT-2PM Topol intercontinental ballistic missiles, carrying a range of 12,500 kilometres, as well as tactical nuclear weapons of an unknown type.... Three decades later, nuclear weapons have returned to Belarus, which pushed for the deployment of the weapons against the backdrop of a rapidly declining security environment in eastern Europe.

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Belarus' nuclear deterrent will not be fully-independent, needing Russian permission to launch and thus falling under Moscow's usage doctrine, but nevertheless the Belarusian doctrine should clarify the conditions in which Minsk sees a security threat rising to the level of nuclear weapons usage... In a statement in March 2023, President Lukashenko accused Warsaw of harbouring invasion plans against his country, pledging that Belarus would use all available means to defend itself, including nuclear weapons, should that happen.

At a U.N. meeting in October 2023, Belarus' U.N. Ambassador Vasiliy Pavlov defended the deployment of the weapons, citing "escalating military-political tensions in the region" as forcing Minsk to strengthen its defence capabilities.

Pavlov furthermore highlighted NATO's nuclear-sharing policy as justification for Russian-Belarusian defence cooperation, echoing Lukashenko's barbs targeting western neighbour Poland, which also seeks to host nuclear weapons....

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pledging that Belarus would use all available means to defend itself, including nuclear weapons, should that happen.

As Lukashenko himself confirmed, the Russian-supplied warheads are for use with tactical, not strategic, weapons, limiting their range to close to Belarus' borders. (Unlike the Topols.) In the event of a decision, Belarus would deliver strikes using the 9K720 Iskander short-range ballistic missile complexes,

delivered from Russia starting in 2022, that are capable of firing missiles armed with both conventional and nuclear warheads out to ranges of at least 500 kilometres.

President Putin has moreover suggested that the Belarusian Air Force's Su-25s could be modified to act as carriers, as well. Moscow still retains control of the nuclear weapons, but having them on his soil has put some swagger in Lukashenko's step. Lukashenko boasted to Russian state media in an interview last June, "No one has so far fought against a nuclear country, a country that has nuclear weapons." He said in another interview, "It's very simple. Join the Union State of Belarus and Russia. That's all: there will be nuclear weapons for everyone."

Source: <https://defenseone.com/ideas/2024/01/belarus-adds-nukes-its-military-doctrine/393405/>, 19 January 2024.

NUCLEAR NON-PROLIFERATION

SOUTH KOREA

South Koreans want their own nuclear weapons as deterrent to North Korea's burgeoning arsenal. Dozens of South Korean and U.S. combat engineers build a pontoon bridge to ferry tanks and armoured vehicles across the water, all within easy range of North Korean artillery. For seven decades, the allies have staged annual drills like this recent one to deter aggression from North Korea, whose 1950 surprise invasion of South Korea started a war that has technically yet to end. The alliance with the US has allowed South Korea to build a powerful democracy, its citizens confident that Washington would protect them if Pyongyang ever acted on its dream of unifying the Korean Peninsula under its own rule.

With dozens of nukes in North Korea's burgeoning arsenal, repeated threats to launch them at its enemies, and a stream of tests of powerful missiles designed to pinpoint target a U.S. city with a nuclear strike, a growing number of South

Koreans are losing faith in America's vow to back its longtime ally.

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South Korean Defense Minister Shin Wonsik said recently that he and his U.S. counterpart signed a document in which Washington agreed to mobilize its full range of military capabilities, including nuclear, to defend

the South from a North Korean nuclear attack. Many in Seoul, however, would prefer nuclear weapons of their own.

At an April summit in Washington, Yoon and President Joe Biden took steps to address such South Korean worries. The result was the Washington Declaration, in which Seoul pledged to remain in the nuclear Non-Proliferation Treaty as a nonnuclear weapons state, and the United

States said it would strengthen consultations on nuclear planning with its ally. South Korean support for nuclear bombs can also be linked to North Korea's extraordinary weapons advancements and to the Russian invasion of Ukraine.

Source: <https://www.milwaukeeindependent.com/newswire/south-koreans-want-nuclear-weapons-deterrent-north-koreas-burgeoning-arsenal/>, 14 January 2024.

UGANDA

Uganda's Opposition to Nuclear Weapons

Uganda is steadfast in its commitment to pushing for the non-proliferation of nuclear weapons, according to State Minister for Energy and Mineral Development Mr. Peter Lokeris. In the course of a formal visit by Dr. Robert Floyd, the Executive Secretary of the CTBTO, Mr. Lokeris emphasized the significance of managing nuclear facilities responsibly across a range of industries, including energy, agriculture, and health.

Although Mr. Lokeris acknowledged the useful applications of nuclear technology in day-to-day life, he underlined the necessity of cautious management, especially in testing to guarantee the safety of nuclear activities. Uganda is committed to prohibiting the enrichment of nuclear resources, such as uranium, for use as weapons. Uganda signed the pact in 1996 and ratified it in 2001.

Mr. Floyd emphasized the value of educating women and children in order to fortify the CTBT and make it a more effective agreement for keeping track of nuclear weapons detonations. Mr. Fred Tugume, the acting commissioner of the Department of Geological Survey, pointed out deficiencies in Uganda's treaty implementation, pointing to low attendance at regular meetings and little involvement from high-level stakeholders in decision-making.

Source: <https://infrastructure.go.ug/ugandas-opposition-to-nuclear-weapons/>, 23 January 2024.

NUCLEAR SAFETY

EU

European Countries Jointly Assess the Fire Protection of their Nuclear Facilities

The member states of the European Union that use nuclear power, together with Ukraine, Switzerland, the United Kingdom and Turkey, have assessed the fire protection of their nuclear facilities. The country report for Finland was compiled by the Radiation and Nuclear Safety Authority. The peer review of nuclear facilities' fire protection is carried out by the EU Nuclear Safety Regulators Group (ENSREG) and all country reports are published on the ENSREG website. Next, the countries will evaluate, comment and learn from each other's procedures and measures.

A fire at a nuclear facility is a threat that must be prevented because if it spreads, it can lead to a

simultaneous failure of several systems that are important for safety... In addition to the fire protection procedures, the countries have reported on plants' fire safety analyses prepared in order to ensure nuclear safety.

The country report for Finland includes an assessment on the fire protection arrangements of all five Finnish nuclear power plant units and spent nuclear fuel storage facilities at nuclear power plants. In addition to STUK, the nuclear

power companies also participated in the preparation of the country report for Finland. One of the key safety principles of Finnish nuclear power plants is continuous improvement. The fire safety of the plants is also continuously being developed, and peer review provides tools for this

development. The Finnish country report does not identify any new development goals for fire safety.

Source: <https://stuk.fi/en/-/european-countries-jointly-assess-the-fire-protection-of-their-nuclear-facilities>, 11 January 2024.

JAPAN

Japan Nuclear Plant Shaken Beyond Some Safety Estimates by Jan. 1 Quake

Oil leaks after 3-meter tsunami, but no damage to reactors reported. A nuclear power plant on the Sea of Japan coast experienced shaking beyond estimated safety levels during the powerful earthquake that hit the country on New Year's Day, the Nuclear Regulation Authority announced on Wednesday. According to the authority and Hokuriku Electric Power Company, the earthquake registered an upper 5 on Japan's seismic intensity scale of 7 in the basement of the unit 1 reactor building at the Shika Nuclear Power Plant in Ishikawa prefecture.

Nuclear power plants have an assumed maximum safety level of shaking for facilities and equipment. Buildings are built to withstand an

expected acceleration of shaking measured in Galileo units (Gal). During the tremor, unit 1 experienced shaking of 957 Gal, higher than the 918 Gal it was built to withstand.

Both units 1 and 2 had been idle and no problems have been reported with functions such as cooling the pool with spent fuel rods, according to the nuclear watchdog. The buildings also sustained no damage. But out of the 116 radiation monitoring posts set up within the premises, measurements could not be taken at six locations as of 6 p.m. Wednesday. Replacement posts have been set up at five locations, according to the authority.

The Shika plant was hit by a 3-meter tsunami following the quake, according to Hokuriku Electric. Some of the power transformers in units 1 and 2 were damaged and leaked oil, making some external power supplies unusable. The utility says it does not know when they can be repaired.

The plant will rely on backup power transformers for now and has readied emergency diesel generators in case power is cut off. Hokuriku Electric also announced on Wednesday that a 6-liter oil spill was detected in the sea near the plant. The oil appears to have come from the power transformer for unit 2. The company says this poses no risk of a radioactivity leak.

The Japanese government said the quake was caused by 45 seconds of movement along a 150-kilometer reverse fault that runs from northeast to southwest on the northern side of Noto Peninsula. Large movements in the Earth's crust occurred to the west of the epicentre, which was near the tip of the peninsula, according to the

Geospatial Information Authority of Japan. These movements explain why the town of Shika, on the opposite side of the peninsula from the epicentre, was the only location to record shaking of 7 on Japan's seismic intensity scale....

Source: <https://asia.nikkei.com/Economy/Natural-disasters/Japan-nuclear-plant-shaken-beyond-some-safety-estimates-by-Jan.-1-quake>, 13 January 2024.

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KENYA

IAEA Sees 'Significant Progress' in Kenya's Research Reactor Preparations

Kenya is pursuing the development of the country's first research reactor, a stepping stone towards a future nuclear power programme, and invited an IAEA mission to review the development of its national nuclear infrastructure.

Andrey Sitnikov, who led the Integrated Nuclear Infrastructure Review for Research Reactors Mission and is the technical lead of the IAEA Research Reactor Section, said: "Kenya has demonstrated a sustained and very professional approach to the development of its research reactor programme. We noted that before making the final decision, Kenya did a great job of developing and preparing laws and regulatory documents, actively involving interested stakeholders in the programme, and developing

human resources of both the future operator and the regulator."

The eight-member mission team, from India and the USA and six IAEA staff members, conducted the nine-day mission in December, reviewing the status of the country's nuclear infrastructure development against the Phase 1 criteria from the IAEA's Milestones Approach, which provides

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guidance for the preparation of a research reactor project on 19 issues ranging from nuclear safety and waste managements to financing.

The mission team provide recommendations and suggestions for the further development of nuclear infrastructure. Kenya plans to commission its first research reactor in the early 2030s. In September 2023 the Nuclear Power and Energy Agency (NuPEA) announced a potential project for a 1000 MWe nuclear plant located in either Kilifi or Kwale.

NuPEA said that following receipt of the mission team's report an Integrated Action Plan would be developed to address the recommendations and suggestions made. It added that the mission "underscores Kenya's unwavering commitment to transparency and cooperation in advancing nuclear technology for peaceful purposes. The insights gained from this review will propel the country toward achieving Kenya's goals of harnessing the potential of nuclear energy safely and responsibly."

Source: <https://www.world-nuclear-news.org/Articles/IAEA-sees-significant-progress-in-Kenya-s-research>, 12 January 2024.

RUSSIA

Russia Blocks IAEA Access to Zaporizhzhia Nuclear Plant

The Russians have not yet granted the IAEA experts present at the Russian-occupied Zaporizhzhia nuclear power plant (ZNPP) access to all nuclear reactor halls of the power plant, IAEA Director General Rafael Mariano Grossi said. Russian troops occupied the biggest nuclear power plant in Europe, Zaporizhzhia NPP, in the Zaporizhzhia Oblast (southeastern Ukraine) on 4 March 2022. Russia restricts international observers' access to the nuclear power plant.

Generally, five nuclear reactors of the Zaporizhzhia NPP have been in cold shutdown, with one kept in

hot shutdown, which the IAEA reported was necessary to produce steam for nuclear safety purposes, including the processing of liquid radioactive waste in storage tanks. "The IAEA experts at Zaporizhzhia NPP have not yet been granted access to the reactor halls of Units no. 1, 2, and 6, which hinders their ability to monitor the nuclear and physical safety situation at the plant, as well as the five specific principles established by the UN Security Council," Rafael Grossi stated. The Russians claimed that the reactor hall was allegedly

"sealed." Instead, they offered the IAEA team access to this area "in about a week," Rafael Grossi stated.

According to Rafael Grossi, such restrictions on timely access of IAEA experts to Zaporizhzhia NPP "impede the IAEA's ability to independently and effectively assess the safety and security situation, including to

confirm the declared condition of the reactor facilities, spent fuel pools and associated safety equipment."

Source: <https://euromaidanpress.com/2024/01/13/russia-blocks-iaea-access-to-zaporizhzhia-nuclear-plant/>, 14 January 2024.

NUCLEAR WASTE MANAGEMENT

CANADA

First Nations, Advocates Criticize Approval of Nuclear-Waste Site Near Ottawa River

Several First Nations and environment advocates have criticized a decision by Canada's nuclear regulator to greenlight a proposed nuclear waste site near the Ottawa River. Several First Nations and environment advocates have criticized a decision by Canada's nuclear regulator to greenlight a proposed nuclear waste site near the Ottawa River.

Following an environmental assessment, the Canadian Nuclear Safety Commission has authorized construction of a waste facility on the

site of the Crown-owned Chalk River Laboratories, which tests nuclear technology in Deep River, Ont., about 180 kilometres northwest of Ottawa. The site sits within a kilometre of the Ottawa River, on the traditional unceded territory of the Algonquin Anishinaabeg peoples.

Kebaowek First Nation councillor Justin Roy, whose community is located on the other side of the Ottawa River, said his First Nation and others are reviewing the regulator's decision and will consider all options, including asking for judicial review. Roy said the project would cause adverse environmental effects including deforestation of almost 40 hectares of old growth forest and put several animal species at risk, including black bears and eastern wolves.

The Canadian Environmental Law Association, an organization that was involved in the review

The Canadian Environmental Law Association, an organization that was involved in the review process, said it regrets the regulator's decision. The proposed facility consists of an engineered containment mound, a wastewater treatment plant, and other support facilities, and it's expected to have an operating life of at least 50 years. It will hold up to a million cubic metres of low-level radioactive waste.

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The Canadian Nuclear Safety Commission launched its environmental assessment in 2016, but First Nations have said the assessment wasn't culturally relevant, leading them to release their own report in June, which noted the area around Chalk River was never ceded by the Anishinaabeg people, nor were they consulted when the original Chalk River Laboratories site was developed in the 1940s.

Source: <https://www.coastreporter.net/the-mix/first-nations-advocates-criticize-approval-of-nuclear-waste-site-near-ottawa-river-8096528>, 12 January 2024.



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