



OPINION – Harlan K. Ullman

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America’s Strategic Nuclear Posture Review Is Miles Off the Mark

Most Americans are unaware of the congressional commission that just released its report on America’s strategic posture, or of the complicated business of nuclear deterrence. After identifying what it calls the unique threats posed by two peer adversaries, China and Russia, the report lays out a comprehensive, all-of-government approach for the nation’s future security, with a clear emphasis on strategic nuclear issues.

What does this mean in simple English? During the Cold War, U.S. nuclear deterrence was predicated on maintaining enough weaponry to destroy the Soviet Union after surviving a USSR first strike. To understand the power of these weapons, one kiloton is the explosive equivalent of 1,000 tons of TNT. A megaton is equal to 1 million tons of TNT. In the late 1960s, Secretary of Defense Robert McNamara arbitrarily set the requirement for deterrence as being able to strike the USSR with 400 megatons of explosives. By comparison, the Hiroshima nuclear weapon was rated at less than 20 kilotons — or 1/20,000 of the McNamara standard. To ensure the survival of its strategic deterrent, the U.S. maintained the triad divided among sea-based nuclear ballistic submarines, land-based intercontinental missiles

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and manned bombers.

Until China began to expand its nuclear deterrent force, deterrence was a bilateral U.S.-Soviet/Russian relationship. Because of arms control agreements of the New START Treaty, the U.S. and Russia are now limited to 1,550 nuclear and thermonuclear warheads each. Now, with China, the strategic balance is becoming “triterrence” and not deterrence. The report states that the U.S.

strategy must plan to deter and defeat “simultaneous Russian and Chinese aggression in Europe and Asia using conventional forces.” If the U.S. and its allies’ conventional forces aren’t

enough, "U.S. strategy would need to be altered to increase reliance on nuclear weapons to deter or counter opportunistic or collaborative aggression."

Its major recommendations are based on the urgent need to expand and modernize our conventional and nuclear forces as well as capabilities across all of government including the defense industrial base. This will cost a great deal of money. Unfortunately, the report does not provide any cost analysis of what the nation must spend in this process. And, unfortunately, there are other unanswered questions the report did not address.

The first is to define deterrence in specific terms and what is needed to discourage China and Russia from taking what actions. China has not been deterred from threatening Taiwan or aggressively expanding its presence in the various Chinese seas to expand its influence and control.

Russia has not been deterred from invading Georgia and Ukraine and threatening the use of nuclear weapons in Ukraine. Second, why was a strategic framework for a triterrence and not a deterrence-based world to incorporate China not considered as well as other force-level options such as a dyad that emphasizes submarines and bombers over nuclear

missiles? Third, has the report exaggerated the threats of China and Russia? While America is obsessed with the prospect of a Chinese World War II-like amphibious invasion of Taiwan, China does not now and for the foreseeable future have that capability. Other options such as a blockade or seizure of Taiwan's offshore island are more effective and likely.

According to United Kingdom Chief of Defense Admiral Tony Radakin, Russia has lost about half of its military capability in Ukraine. Currently, NATO

maintains a large conventional military advantage over Russia. The accession of Finland surely complicates Kremlin thinking. And there is no reason why Russia would attack NATO. Costs are a critical factor. In fiscal 2024, the U.S. could spend nearly \$900 billion on defense. And the force still continues to shrink.

This is the contradiction of uncontrolled real annual cost growth of about 5 percent to 7 percent plus inflation of 3 percent to 7 percent. About 8 percent to 14 percent increases a year in defense are needed just to stay even. The irony is that the more America spends, the more the force contracts, quantitatively and qualitatively.

To meet the recommendations for increasing conventional forces and modernizing the triad's forces with strategic bombers and intercontinental ballistic missiles, an annual increase of one-fifth to a quarter in defense spending (\$1.08 trillion to \$1.12 trillion a year) is needed. Given the debt and deficits and nearly \$700 billion for annual interest payments, will Congress approve that short of war? Before this

report becomes policy, perhaps answering these questions is a good idea.

Source: <https://thehill.com/opinion/national-security/4282404-americas-strategic-nuclear-posture-more-deterrence-and-more-weapons/>, 30 October 2023.

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OPINION – Xie Yanbing, Li Chun

Emerging Technologies Intensify Nuclear Risks, but Nuclear Warfare is Unlikely

The 10th Beijing Xiangshan Forum was opened on October 30 with a new topic of “nuclear risks and global security” included in the agenda. Emerging technologies have increasingly intensified the nuclear risks, but the probability of nuclear warfare is minimal, experts said during the forum.

The escalating geopolitical conflicts today have impacted global strategic balance and stability. Lora L Saalman, a non-resident senior researcher at the SIPRI in Sweden, said in an interview with the media during the forum that, on the one hand, cyber-attacks by non-state actors on satellite and missile-related infrastructure are getting more prevalent nowadays, and on the other hand, the continuous evolution of emerging nuclear technologies and potential risks around human control capabilities result in heightened global nuclear risks.

Eduardo Antonio Diez, Director of the International Relations Department of the University of Belgrano in Argentina, agreed that nuclear risks not only denote nuclear war and nuclear proliferation, but also include the possible impacts of artificial intelligence on nuclear security. Application of artificial intelligence in nuclear weapons could lead to catastrophic consequences. And he further pointed out that the potential for achievements

of non-nuclear states is finite, if major countries do not engage in the multilateral arms control, non-proliferation and disarmament processes.

Other factors, including the US-UK-Australia nuclear submarine cooperation, are also disrupting the international nuclear non-proliferation regime.

Senior Colonel Zhao Xiaozhuo, a research fellow with the Chinese PLA Academy of Military Sciences, indicated that nuclear weapons have great destructive power. Still, the current nuclear non-proliferation mechanism is waning in effectiveness. “This is what we are worried about, and if this goes on, the whole of humanity will suffer,” he said.

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The Ukraine crisis continues to persist, and the potential use of nuclear weapons by Russia also raises international attention. Retired Lt. Gen.

Evgeny Buzhinskiy, Chairman of PIR Center, commented that nuclear risks are getting more intricate in the context of deteriorating relations between Russia and the West. He said that the nuclear policies of Russia are based on the concept that a nuclear war is both unwinnable and unacceptable, as any country caught in a nuclear war would be devastated in the end. Russia will only turn to nuclear weapons in the event of facing an attack by

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WMD, or if conventional weapon attacks threaten the survival of the nation. “Nuclear weapons have always been more about deterrence. Some countries’ conduct of nuclear tests or withdrawal from the CTBT has incurred nuclear risks to some

extent, but the probability of a nuclear war breaking out is highly remote," Saalman added.

Source: http://eng.chinamil.com.cn/OPINIONS_209196/Opinions_209197/16263501.html, 31 October 2023.

OPINION – Jim Tucker

Time to Rethink Our Nuclear Negativity

It's not often media columnists begin by saying they sincerely hope they're wrong, but here goes - we may be heading for nuclear power. Impossible, you say. We are one of the world's most entrenched opponents to anything nuke. Aren't we? We have an outstanding history of opposition, which has always seemed sensible despite irritation shown by the US, who invented nuclear science during World War II and used it twice to finally bring Japan to its knees. Since then, the world has somehow clung to wobbly nuclear arms treaties that hinge on the proposition nuclear war would not be survivable.

Despite that, nuclear energy's benefits are widely used to generate power, although Australia and NZ have resisted. We've long had plentiful hydro for base power generation and the Aussies rely on fossil fuels. Whenever nuclear power potential has been raised here by politicians like Rob Muldoon and Don Brash, public response has been overwhelmingly, emotively negative. Until recently. Now, main media references suggesting nuclear power might yet be a viable option have become common.

How so? Has it become safer, less costly, more morally acceptable? Perhaps. But more importantly, it's getting smaller. Before I explain

it may help to refer back to NZ's first significant exploration of nuclear power in 1977, when the Muldoon government staged a heavy-duty commission of inquiry. It involved experts and nuke opponents from around the world contributing their opinions of the NZ Electricity Department's plan to build a 1200 megawatt nuclear plant by the turn of the century, up north at Kaipara Harbour...and maybe five others (mostly smaller) throughout the country after that.

To give you an idea of size, our biggest current power source is the 953mw Huntly station, whose units use coal and gas to generate base-load (constant) electricity. After hearing everyone's views, the commission panel concluded it was safe to go ahead, even though it had doubts about earthquake risk and what to do with the contaminated wastes. It also estimated we would need more uranium fuel than was currently being produced in the world (none was easily got here).

It wrongly guessed we would need about 140,000mw hours of power by 2020; actual consumption that year was about 40,000, suggesting 1970s electricity gurus were overly determined to boost the case for nuclear. I recall as the Auckland Star's energy reporter that I spent two weeks sitting through the commission's hearings, and at one stage interviewed the NZED's star witness, American nuke scientist Edward Teller, so-called "father of the H-bomb". That's the "super" version that would kill everyone.

Subsequent governments didn't go ahead with the nuke plan, although Don Brash appeared ready to adopt it in some form or other when he led National's bid for election in 2004, declaring that

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According to the WNA, lately there has been accelerated interest in plants smaller than 300mw to use on industrial sites and in remote communities. A lot of design and testing work is going on with four different types. That's attracting entrepreneurial interest because the costs are much lower, plants can be modular and easily moved, safety precautions are less demanding (they can be built underground), and decommissioning would be simpler.

under his rule our ban on nuclear-powered ships would be “gone by lunchtime”. The fact ships can be powered by small nuke generators shows we have long had the means to build and contain mini versions of nuclear power stations.

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So, what would prevent us taking advantage of this new trend? Pride and fear. As I’ve said, we’re justifiably proud of our history as an anti-nuclear nation. It is inter-generational and deeply entrenched, politically hyper-sensitive, untouchable even. Our fears seem justified, given Putin has hinted he might introduce nuclear-associated weapons to the Ukraine war, and there are reports of attacks on Ukrainian nuclear power plants. Chernobyl is in Ukraine, still contaminated nearly 40 years after its devastating nuclear accident. It will be hard to convince four out of five Kiwis there may be a

new nuclear age coming that has nothing to do with war, and may ideally replace coal, oil and gas. But at least we ought to consider it.

Source: <https://www.stuff.co.nz/taranaki-daily-news/opinion/301003751/time-to-rethink-our-nuclear-negativity>, 11 November 2023.

OPINION – John Polanyi

We Cannot Give Up on the Dream of Nuclear Disarmament

When I was a young chemist at the University of Toronto in 1961, I found myself drawn into the central debate of the age.

The Globe and Mail’s pages were discussing nuclear war, asking, “if war comes, would we survive?” The question is as valid today as 62 years ago, but we have learned a little in the interim.

In March, 1961, John Gellner, The Globe’s military commentator, wrote these surprising words on the defeatism

that marked the mood of the time: “That humanity can survive a nuclear war, and carry on after it, has been established not by the sort of freewheeling speculation that the proponents of

surrender generally indulge, but by a thorough scientific enquiry conducted by the U.S. RAND Corporation.” Basing his remarks on his reading of the 1961 RAND report, On Thermonuclear War, by Herman Kahn, Mr. Gellner went on to say, “If certain basic preparations have been made, economic

recovery would be 60 per cent complete within one year of a nuclear attack launched against the U.S. in the early 1960s.” The population, he conceded, would have had to “rough it for a time, but could definitely pick themselves up.”

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I responded to Mr. Gellner in the *Globe* of April 5, 1961, arguing that he had taken from Mr. Kahn's book the absurdly optimistic and hazardous assumption that the victims of a nuclear attack would respond by evacuating all our sizable cities, thus (in my view) precipitating the greatest panic in history. This alarming debate in a respected newspaper did not pass unnoticed. I found myself invited to the office of the minister of foreign affairs at the time, Paul Martin Sr., in Ottawa. He seized his phone and asked to be connected to the House of Commons library. I heard the librarian explaining, apologetically, that Mr. Kahn's book was presently unavailable since it had been borrowed by Lester Pearson, the prime minister.

My modest excursion into scientific activism had already led to an invitation to participate in a Pugwash Conference, a global disarmament meeting held in Moscow in 1960. On arrival in Moscow, I was handed a message from my host, the Soviet leader Nikita Khrushchev. He was confident, he said, that his demand for "universal and complete disarmament" would be accorded the meeting's unanimous approval.

This was a worthy goal. I regarded it then as pie in the sky. But today I consider it the very best hope for mankind. This desired outcome, as Mr. Khrushchev stated it, was not to be achieved without incident. Two years later, the world was faced with unmistakable evidence of the secret emplacement of nuclear weapons in Cuba by the USSR. The contending nations had been plunged into what we know today as the Cuban Missile Crisis – 13 days in which the world teetered on the brink of all-out nuclear war.

What had happened to the unanimous desire for peace that Mr. Khrushchev anticipated? Had it become a casualty to the foolish complacency of the RAND report? Surely not. It derived from something more real than that. Despite the

heartening embrace today by world leaders of the dictum that "a nuclear war cannot be won and must never be fought," we continue to plan for nuclear war. This is the source of our peril.

It remains evident today in the sustained ambition of states to modernize every branch of nuclear weaponry, whether on land, sea or in the air. The reasoning behind this is simple; these weapons have the purpose of deterring an attack by an opponent who will then cease to be a threat. They exist, therefore, to do the thing that is avowed to be impossible, namely to win a nuclear war.

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thing that is avowed to be impossible, namely to win a nuclear war.

Last week, Vladimir Putin signed a law revoking Russia's ratification of the global treaty banning nuclear testing. This is bad news, but fortunately, the 2011 New START Treaty is still in effect. Under that deal, the U.S. and Russia agreed to limit the number of nuclear warheads to 1,550. Each weapon is, however, a city-destroyer. Moreover, the accord is in the process of being weakened by pressure to increase the number of missiles to counter a rising China and to offset an increased pace of warfare anticipated in a world of AI. For U.S. president Kennedy, the possibility of the destruction of mankind was constantly on his mind. "If we err we do so not only for ourselves ... but also for young people all over the world, who would have no say." Are we ready to assume that responsibility?

Source: <https://www.theglobeandmail.com/opinion/article-we-cannot-give-up-on-the-dream-of-nuclear-disarmament/>, 06 November 2023.

OPINION – William D. Hartung

Can America Afford a New Nuclear Weapons Buildup?

Even as the Pentagon budget soars toward \$1 trillion per year and President Biden is seeking a \$100 billion-plus emergency spending package to,

among other things, provide military aid to Ukraine and Israel, a new congressional commission report has suggested spending even more. This time the money would go toward a dangerous and unnecessary nuclear weapons buildup that could devour huge quantities of tax dollars for years to come.

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The panel, which officially goes by the rather intimidating name of the Congressional Commission on the Strategic Posture of the US, wants to pave the way for a future president to increase or replace virtually every element of America's nuclear arsenal, from nuclear-armed missiles and submarines to new nuclear warheads. Given our current stockpile of more than 5,000 nuclear weapons — enough to end life as we know it several times over — the commission's proposals would represent a textbook case of nuclear overkill.

At a recent Senate hearing on the commission's report, only a handful of members raised questions about what its recommendations would cost, including Sen. Roger Wicker, R-Miss., and Sen. Elizabeth Warren, D-Mass. Amazingly, the commission co-chairs not only couldn't say, but acknowledged that they hadn't even tried to make an estimate. At a time when the national debt is more than \$33 trillion, this is an inexcusable case of fiscal irresponsibility.

The Pentagon is already in the midst of a three-decades-long effort to build a new generation of nuclear weapons that could cost up to \$2 trillion. Spending even more would undermine both our military and economic security. The most likely outcome of such an initiative would be an accelerated arms race with Russia and China that would increase, not decrease, the risk of a

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Why would the commission make such a misguided set of recommendations at a time when America can ill afford to carry them out? The answer seems to be a mix of outmoded thinking and conflicts of interest. To cite just one example, commission co-chair Jon Kyl, a former senator from Arizona, has been a lifelong opponent of nuclear arms control dating back to his successful effort to block US ratification of a comprehensive ban on nuclear testing that would have slowed the spread of these deadly weapons. After leaving the Senate, Kyl served a stint as a lobbyist for Northrop Grumman, the company that benefits most from our current buildup as prime contractor for a new nuclear-armed bomber and a new land-based, long range nuclear-armed missile.

To the extent that the commission's recommendations have a real-world rationale, it is the prospect that China will build up its nuclear arsenal to 1,000 weapons or more over the next decade, a figure close to but lower than the current level of deployed U.S. nuclear weapons, and far below the overall U.S. stockpile of more than 5,000. As Secretary of Defense Lloyd Austin has aptly noted: "Nuclear deterrence isn't just a numbers game. In fact, that sort of thinking can spur a dangerous arms race." Furthermore, as the Arms Control Association has pointed out, "a large-scale nuclear exchange between the US and Russia would kill and injure more than 90 million people in the first few hours, and many more in the days and weeks afterward. This is no time for a new nuclear arms race."

To add insult to injury, the congressional commission recommends seeking to limit or reduce global nuclear arsenals only after its proposed buildup is well along,

an approach that would effectively kill efforts at nuclear arms control for decades to come. There has to be a better way. The Biden administration and Congress should take the new report with more than a few grains of salt, and devise an alternative plan that can save both money and lives in a world already racked by dangerous conflicts.

Source: <https://www.dailypress.com/2023/11/06/opinion-can-america-afford-a-new-nuclear-weapons-buildup/>, 06 November 2023.

OPINION – Arthur I. Cyr

World Leaders Must Continue to Contain the Threat of Nuclear Weapons

Generally under the radar of media and public attention, representatives of China and the US met on Nov. 6 in Washington D.C. for the first exploratory discussions on nuclear arms restrictions since the Obama administration. This is promising news. Keeping the talks away from the media spotlight indicates seriousness. In January 2021, the New START Treaty with Russia was extended for five years. The agreement, which was about to expire, limits nuclear warheads on each side to 1,550, plus limitations on missiles and bombers.

However, in November 2022 talks on inspections were suddenly suspended. Russia announced the treaty is now in jeopardy. In January, Russia's Deputy Foreign Minister Sergei Rablov denounced U.S. efforts to impose "strategic defeat" on Moscow in Ukraine. The Trump administration experienced frustrations in arms control. Initial emphasis on ending North Korea's nuclear weapons program was unsuccessful. In August 2019, the

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administration withdrew from the INF Treaty, complaining of violations by Russia.

The Obama administration emphasized nuclear summits involving large numbers of nations and international organizations. The 2016 Nuclear Summit in Washington D.C. concluded with a formal statement underscoring nuclear weapons control. Unfortunately, Russia did not participate. That reflected strained relations with the U.S. and other nations following annexation of Crimea. Nonetheless, the major conference reinforced the important, tangible U.N. framework to coordinate national efforts. The first Nuclear Summit took place in 2010, also in Washington D.C.

In 1986, during a summit meeting in Iceland, Soviet General Secretary Mikhail Gorbachev and President Reagan surprised their staffs, as well as the world, by pledging the abolition of all nuclear weapons. That utopian vision fostered a practical result: the INF Treaty signed in 1987. Reductions are desirable, but efforts to outlaw all nuclear weapons are fundamentally flawed. Destroying all known nuclear weapons would provide a decisive advantage to any power which decided — openly or secretly — to hold back even a few. Verification remains vexing.

Another benchmark in the history of nuclear weapons, arms control and the Cold War occurred in 1972 when the SALT led to treaties between the U.S. and the Soviet Union limiting missile systems. A second round of negotiations resulted in a follow-on agreement in 1979, but the U.S. Senate did not ratify the treaty, in reaction to the Soviet invasion of Afghanistan that year.

After the Cuban missile crisis of October 1962, concluded when the Soviet Union withdrew nuclear weapons from the island, President Kennedy's political standing rose considerably. During the Christmas season, JFK held a televised discussion with network correspondents. He gave emphasis to a world soon to contain a number of nuclear powers. In fact, proliferation has moved much more slowly than anticipated at the time. Various nuclear-capable nations, including our close ally Canada, have decided that any conceivable benefits are simply not worth the expense and risks.

Additionally, the IAEA, an initiative of President Eisenhower, facilitates peaceful nuclear energy and provides a long-term drag on military pressures to get the bomb. Ike, always comprehensive in vision, also achieved demilitarization of Antarctica. International commitment to arms control is firmly established. Russia today clearly is on the defensive. Military threats are not only external. In early 1961, President Eisenhower closed his Farewell Address by warning of the dangers of our massive arms establishment, which he termed, "the Military-Industrial Complex." Ike's foresight is striking.

Source: [https:// www.chicagotribune.com/suburbs/lake-county-news-sun/opinion/ct-Ins-cyr-arms-control-st-1109-20231108-kct6c3chjffdvndidbklfisk6a-story.html](https://www.chicagotribune.com/suburbs/lake-county-news-sun/opinion/ct-Ins-cyr-arms-control-st-1109-20231108-kct6c3chjffdvndidbklfisk6a-story.html), 08 November 2023.

NUCLEAR STRATEGY

RUSSIA

Russia Test Fires Nuclear-Capable Ballistic Missile

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Russia said Sunday it had successfully test-launched an intercontinental ballistic missile capable of carrying nuclear warheads from one of its submarines. The launch of the "Bulava" missile, the first in just over a year, comes as Russia ramps up nuclear rhetoric since revoking its ratification of a key nuclear

test ban treaty. "The new nuclear-powered strategic missile submarine cruiser Emperor Alexander the Third has successfully launched the Bulava sea-based intercontinental ballistic missile," the defence ministry said. It said it fired the under-sea missile from an undisclosed location in the White Sea on its northwest coast, to a target thousands of kilometres away on the far eastern Kamchatka peninsula. "The missile firing took place in the normal mode from an underwater position," it said, adding: "The missile heads arrived at the designated area at the appointed time."

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The 12-metre long Bulava missile was designed to be the backbone of Moscow's nuclear triad and has a range of over 8,000 kilometres (close to 5,000 miles). The West has accused Moscow of using reckless nuclear rhetoric since it launched its offensive against Ukraine last February. President

Putin earlier this week signed a law revoking Russia's ratification of the CTBT, a move strongly criticised by the US. The 1996 treaty outlaws all nuclear explosions, including live tests of nuclear

weapons, though it never came into force because some key countries — including the US and China — never ratified it.

Source: <https://www.kyivpost.com/post/23682>, 05 November 2023.

USA

A New U.S. Strategy Against WMD Threats

The U.S. Defense Department has released a new strategy for countering WMD around the world, arguing that the threats from nuclear, chemical, biological, and radiological weapons have increased and changed significantly since 2014.

“For nearly two decades, the security environment required the department to focus on counterterrorism and counterinsurgency operations [and] prioritize managing WMD risk emanating from hostile, fragile or failed states and safe havens,” according to the strategy document released on Sept. 28.

But now the US is facing a “pacing” challenge from China and an “acute”

threat from Russia while Iran and North Korea are considered “persistent” threats and such adversaries “seek to leverage [weapons of mass destruction] to influence and constrain the US across the spectrum of conflict,” the document said. It argued that “the department must now recapitalize, and in some cases reconstitute, its ability to conduct large-scale joint operations within a WMD-contested battlespace.”

The document, entitled the Countering Weapons of Mass Destruction Strategy, expands on the Biden administration’s 2022 National Defense Strategy. It lays out four priorities: defending the homeland from WMD attacks; deterring WMD use against the US and its allies and partners; building a joint force to prevail in an environment where chemical, biological, radiological, and nuclear threats are contested; and preventing new WMD

threats.

The US is set to undertake these activities “in an integrated approach along with military, diplomatic, and economic instruments of power” to diminish the political advantage gained from WMD use in an adversary’s decision calculus and “demonstrate the undesirable costs [the adversary] will face should it use” these weapons, it said. Defense Secretary Lloyd Austin drove home this point in his introduction to the strategy document. “We will sustain and broaden our work in collaboration with other U.S. departments, agencies, allies and partners to deter [WMD] use,” he wrote. “If deterrence fails, we will field a force

that is resilient and prepared to prevail in a [WMD] contested environment.”

U.S. extended deterrence is one tool that underlies the new strategy. An example cited by Richard Johnson, deputy assistant secretary of defense for nuclear and countering weapons of mass destruction policy, was the Washington Declaration in April 2023 between U.S. President

Biden and South Korean President Yeol. He said that the declaration reflected a U.S. effort to integrate its nuclear forces with South Korea to prevent an unintended escalation of tensions with North Korea and to enhance deterrence. Johnson, speaking at an event in Washington on Oct. 18, said this approach prevents proliferation, presumably referring to South Korean support for developing its own nuclear weapons.

The strategy document notes the global availability of dual-use technologies, particularly biotechnology, and said that adversaries are adapting to U.S. counterproliferation measures. These two defining features of the evolving global security environment must be addressed. In a noteworthy addition to the last strategy published in 2014, the new document recognizes emerging technologies such as big data and artificial

The document, entitled the Countering Weapons of Mass Destruction Strategy, expands on the Biden administration’s 2022 National Defense Strategy. It lays out four priorities: defending the homeland from WMD attacks; deterring WMD use against the US and its allies and partners; building a joint force to prevail in an environment where chemical, biological, radiological, and nuclear threats are contested; and preventing new WMD threats.

intelligence, multidomain WMD misinformation pursuits by China and Russia, and the complexity of determining a biological weapons attack as exacerbating new features of WMD activities.

The WMD document assesses the risk from China in the context of the PLA's aggressive expansion and modernization of its nuclear forces in combination with the ambiguity about the conditions under which China would act outside of its declared policy of no first use of nuclear weapons. It also expresses concern that China violated the Chemical Weapons Convention and the Biological Weapons Convention. The different strategic approaches in the 2014 and 2023 defense strategy documents reflect a shift toward a more dynamic, proactive, and comprehensive approach to weapons of mass destruction, considering a wider array of factors and resources.

Source: <https://www.armscontrol.org/act/2023-11/news/new-us-strategy-against-wmd-threats>, 08 November 2023.

Ballooning US Defense Budget is Aimed at One Thing Only: Terror, Terror, Terror

Nobody would disagree that the US' ability to maintain its global hegemony derives from its military strength. It's also undeniable that the US' military strength has been based on nuclear weapons since World War II. The US has played a leading role in the development of nuclear weapons and the evolution of nuclear strategy. While nuclear strategy might seem like a frighteningly difficult concept, its central precept is disturbingly simple: terror. That single word explains the bulk of the field.

Terror is the origin of nearly all the concepts related to nuclear weapons, including nuclear deterrence, the doctrine of limited nuclear war,

missile defense, nuclear arms control and the anti-nuclear movement. The US has played a leading role in most of those, except for allowing other countries to develop nuclear arsenals. One reason previous US administrations have released documents about the US' nuclear strategy is to reduce the danger and fear of a nuclear war. Over the past year, the Biden administration has published at least five official documents on the topic.

In October 2022, for example, the US Department of Defense released its "National Defense Strategy" (produced every four years), along with the "National Posture Review" and "Missile Defense Review." This past February, the Office of the Director of National Intelligence made public a version of the "Annual Threat Assessment," which includes nuclear threats. On Sept. 28, the Department of Defense released the "2023 Strategy for Countering Weapons of Mass Destruction," and the Strategic Posture Commission, which consisted of 14 members of the House of Representatives, released its final report this month. On Oct. 19, the Department of Defense submitted to Congress a yearly report titled "Military and Security Developments Involving the PRC" that includes the estimate that China is in possession of around 500 nuclear warheads.

US Insinuate Nuclear Response to Use of Chemical and Biological Weapons: Strategic planning typically proceeds as follows: current and future threats are assessed, goals and methods for addressing those threats are identified, the specific weapons, units and troops required for their implementation are calculated, and those elements are at last added to a budget. But at every stage of that process, the recently released documents about the US nuclear strategy differ

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from the approach taken from the end of the Cold War until at least the Obama administration. The biggest change is that China is regarded as being nearly equal to Russia. The US sees this as the first time it has faced two strong competitors with nuclear weapons.

The US believes that China's current nuclear stockpile is about 100 higher from the previous estimate of 410 warheads (made by the SIPRI in January) and expects that number to reach around 1,000 by 2030. Because the US is limited to 1,550 deployed nuclear weapons by its New START arms

reduction treaty with Russia, that suggests that China will acquire a nuclear capability that's roughly comparable with the US within a matter of years. Add to that the nuclear threat from North Korea, the only nuclear power outside the NPT with the will and ability to strike the US mainland. The goal of any country's nuclear strategy of any era is the deterrence of nuclear war. In addition to this unchanging, universal goal, how nuclear weapons will be used can also be an objective.

China declared a "no first use" policy at the same time as it started to arm itself

with nuclear warheads, while the US and Russia did not. In the war in Ukraine, Russia has hinted at the possibility of using nuclear weapons, and the US has hinted that it could use them as retaliation, if their enemies use chemical or biological weapons or engage in cyberattacks. Biden has since abandoned his "sole purpose policy" that would only entail using America's nuclear arsenal to deter — and, if necessary, retaliate for — a nuclear attack against the US

and its allies, which he advocated for before he took office, and has called for "integrated deterrence," which combines military power, including nuclear capabilities, with diplomacy and

strong alliances to deter adversaries. Here, deterrence is not only applied to enemy nuclear attacks.

With at least two states (plus the variable of North Korea) as the target of nuclear deterrence and the decision to implement integrated deterrence, the US response strategy is inevitably changing, and the language that makes up strategic documents shows

us which direction it is headed in. The first is to strengthen its nuclear arsenal in terms of both quantity and quality. As China's nuclear arsenal grows, the US will likely scrap its New START treaty commitments, which limits the number of nuclear

weapons. Qualitatively, it will modernize the so-called "nuclear triad" by replacing decades-old ICBMs and SLBMs with new ones and introducing a new generation of strategic bombers. The plan is to complete these programs by roughly the mid-2030s.

In addition to nuclear weapons, investments in advanced conventional

weapons and new weapons systems are also on the rise. Missile defense systems are being advanced as "war nets," comprising layers of interlocking detection, tracking, and interception systems spanning the land, sea, air, space, and cyber domains, and linking them to instantaneous precision strike systems. Military artificial intelligence, which combines big data and ultra-fast computation, will "command" the commander's judgment, and unmanned systems,

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which work tirelessly around the clock, will play a role in defense and offense. In short, US military supremacy will be maintained through a thoroughly technological approach, with the ability to both “defend virtually perfectly” and “attack as necessary.”

US Scholars Say Nuclear Strategy is Good Enough for Now:

The US nuclear strategy inevitably brings with it two age-old problems. One is skyrocketing defense costs. The proposed fiscal year 2024 US defense budget is the largest in history, totaling US\$842 billion. This includes more than US\$170 billion for airpower, US\$48.1 billion for the Navy, and US\$63.1 billion for missile defense, all of which are relatively relevant to nuclear strategy. (For comparison, the Green Climate Fund, which was launched in 2013 to support climate action in developing countries, has a total global commitment of US\$13.5 billion for 2020-23.)

The second problem is the destruction of peace and strategic instability caused by arms exports and arms races. The US is the world’s largest exporter of conventional weapons to all countries and groups. It is clear that the nuclear arms race will continue to accelerate in response to China, Russia and North Korea for some time to come. Even if the US builds up its nuclear arsenal in response to several countries at the same time, those targets will respond to the US individually.

Three American academics, including Charles L. Glaser, recently wrote a joint op-ed in *Foreign Affairs* arguing that “the US nuclear arsenal can deter both China and Russia,” and that there is no need for the US to augment the total size of its nuclear arsenal. With 14 US Navy Ohio-class nuclear submarines, each armed with 20 ballistic

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With 14 US Navy Ohio-class nuclear submarines, each armed with 20 ballistic missiles, which are each themselves armed with eight warheads, each carrying hundreds of kilotons of power, plus 400 ICBMs and 60 strategic bombers, the argument goes, the US has more than enough firepower as it is.

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The world is suddenly being pulled into a war trap. In Ukraine and Gaza, resentment, hatred, and fear are permeating the atmosphere, but the US — one of the root causes for

such hostility — is not doing enough to achieve a ceasefire and peace. The security of the Korean Peninsula is also stuck in the trap of “nuclear reductionism,” which sees North Korea’s nuclear weapons as the root of all evil and thinks that the only solution to that problem is the end of the Kim regime and the denuclearization of North Korea.

Source: https://english.hani.co.kr/arti/english_edition/e_international/1114935.html, 05 November 2023.

US Announces Addition of B61-13 Nuclear Bomb Amid Rising Global Tensions

The Department of Defense made a significant announcement this past Saturday, revealing the US’s decision to introduce a new nuclear bomb model to its formidable arsenal. This development comes at a time of heightened

global tensions, bringing renewed attention to the nation’s nuclear strategy.

A New Chapter in Nuclear Deterrence: The forthcoming gravity bomb has been designated as the B61-13, building upon the legacy of the B61 model, which was first unveiled in the 1960s. The Department of Energy’s National Nuclear Security Administration is poised to commence its production, pending the green light from Congress in terms of authorization and the necessary appropriations. Insider sources had previously shed

light on the capabilities of the B61-12, the model preceding the B61-13. The B61-12 was renowned for its versatility, with the capability to conduct earth-penetrating attacks, both low-yield and high-yield attacks, above-surface detonations, as well as bunker-busting operations. The motivation behind this latest addition was explained by the Department of Defense in a succinct fact sheet. Rather than being in response to a specific event, the move is a reaction to the broader "changing security environment" that the world finds itself in.

A World on Edge: The Larger Context: This strategic development has been unveiled at a particularly sensitive juncture. Mere days prior, the US made public a worldwide caution travel advisory in the backdrop of the Israel-Hamas conflict. *The advisory painted a grim picture, stating, "Due to increased tensions in various locations around the world, the potential for terrorist attacks, demonstrations or violent actions against US citizens and interests, the Department of State advises US citizens overseas to exercise increased caution."*

For context, the last time the US sounded a worldwide caution alert was in August 2022. This was subsequent to the assassination of al-Qaeda's then-leader, Ayman al-Zawahiri, as reported by CNN. Commenting on the volatile global atmosphere, Todd Brown, a retired senior State Department official, shared his perspective with CNN. Brown's decades of experience in international affairs and diplomacy lend weight to his somber observation that the present situation "surpasses anything I have seen before," with an undertone of caution that things might "get even worse." In such turbulent times, the unveiling of the B61-13 serves as a potent

reminder of the importance of strategic readiness and the ever-evolving nature of global geopolitics.

Source: <https://www.financial-world.org/news/news/financial/22866/us-announces-addition-of-b6113-nuclear-bomb-amid-rising-global-tensions/>, 29 October 2023.

Congress Aims to Fund Nuclear Weapon Opposed by Biden

For the second consecutive year, Congress is poised to fund the development of a new U.S. nuclear SLCM despite the Biden administration's effort to end the controversial program. Since Congress staved off a government shutdown with a continuing resolution in September, the House and Senate have continued to iron out differences in their respective versions of the fiscal year 2024 National Defense Authorization Act (NDAA). The House version allocates \$260 million and the Senate \$265 million for the development of the missile and its associated warhead, suggesting that the final version likely will reflect something similar.

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The Biden administration did not request any funding for the SLCM in 2024. The missile "has marginal utility and would impede investment in other priorities," the White House

said in a policy statement in July. "The [US] has sufficient current and planned capabilities for deterring an adversary's limited nuclear use through conventional and nuclear armaments." Rep. Adam Smith (D-Wash.), ranking member of the House Armed Services Committee, similarly has emphasized that the program would walk "us down a path of spending enormous amounts of money on a capability that we don't really need," according to a June 21 article in *Defense News*.

But other lawmakers view the SLCM as essential

to U.S. national security. "The nuclear threat environment is changing rapidly," stated Rep. Doug Lamborn (R-Colo.), chair of the House Armed Services strategic forces subcommittee, in defense of the SLCM in the same *Defense News* story. "We must adjust our nuclear posture." Sens. Deb Fischer (R-Neb.) and Angus King (I-Maine) argued in an op-ed in *The Washington Post* in September that the low-yield nuclear SLCM "fills th[e] gap" in the U.S. tactical nuclear arsenal and "can be a critical part of maintaining the credible deterrent that has protected us all these years." In 2023 the Biden administration also did not request funds for the nuclear SLCM, although Congress ultimately authorized a total of \$45 million for the development of the missile and its warhead.

Another Biden administration policy decision that the House and Senate have pushed back on is the retirement of the megaton B83 gravity bomb fleet by limiting funds until the completion of a related report mandated in 2023. The B83 fleet was slated for retirement until the Trump administration indefinitely postponed it in 2019, and now the Biden administration aims to resume the initial retirement plans. The House passed its NDAA on July 14, and the Senate passed its version on July 27. The September continuing resolution will keep the government open through Nov. 17....

Source: <https://www.armscontrol.org/act/2023-11/news/congress-aims-fund-nuclear-weapon-opposed-biden>, 08 November 2023.

BALLISTIC MISSILE DEFENCE

RUSSIA

Russia Says It Test-Fired ICBM from New Nuclear Submarine

The Russian military on 5 November reported a successful test launch of an intercontinental ballistic missile designed to carry nuclear warheads from a new nuclear submarine. The report comes as tensions are soaring between Russia and the West over the fighting in Ukraine. Adding to those tensions, President Putin last week signed a bill revoking Russia's ratification of a global nuclear test ban in a move that Moscow said was needed to establish parity with the US.

The Russian Defense Ministry said in a statement that the Emperor Alexander III strategic missile cruiser fired the Bulava missile from an underwater position in Russia's northern White Sea, and hit a target in the far-eastern region of Kamchatka. It wasn't immediately clear from the statement when the test launch occurred. The Emperor Alexander III is one of the new Borei-class nuclear submarines that carry 16 Bulava missiles each and are intended to serve as the core naval component of the nation's nuclear forces in the coming decades. According to the Defense Ministry, launching a ballistic missile is the final test for the vessel, after which a decision should be made on its induction into the fleet. The Russian navy currently has three Borei-class submarines in service, one more is finishing tests

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and three others are under construction, the Defense Ministry said.

Source: <https://www.stripes.com/theaters/europe/2023-11-09/russia-intercontinental-ballistic-missile-nuclear-sub-11998325.html>, 09 November 2023.

EMERGING TECHNOLOGIES AND DETERRENCE

IRAN-RUSSIA

Iran Sets Sights on Russia's Hypersonic Missile Technology

Russia's advanced hypersonic missile technology is top of a possible list of technology transfers wanted for Iran's rocket programme, as its expansion is set to present major threats to the Gulf region, an influential think tank has reported. A proliferation of missile and drone warfare in Ukraine has created a growing two-way market between Tehran and Moscow, which is now delivering technological advances for the Iranian programme, the IISS said.

Russia's invasion of Ukraine has fuelled a global buying spree for cheap, accurate missiles that will threaten international stability, the IISS warned. In reference to the US electronics retail chain Radio Shack, the report says adaptation of civilian software can be used to control weaponry as advanced as cruise missiles. Iran's help in supplying Russia with hundreds of kamikaze drones has demonstrated to less wealthy states and potentially terrorists that they can strike targets at distance with accuracy

The Ukraine conflict, alongside weapons supplied by Iran to Yemen's Houthi rebels, has shown that

manufacturing long-range, precision munitions "is relatively easy and inexpensive". Weapons that can use "dual-capable technology" are available on the open market, including "the so-called Radio Shack cruise missile", such as the Iranian 351/Quds. The IISS reported a "bleak outlook" on whether current international arms-control treaties would curtail an uncontrolled expansion in precision missiles.

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The Ukraine war has for the first time featured the large-scale operation of attack drones, in particular the Iranian Shahed 136, which has deepened the working relationship between Russia and Iran. "Co-operation on the latter is drawing Moscow and Tehran closer together, with uncomfortable implications for many countries concerned as to the destabilising behaviour of the two states.

now likely "redoubling" its efforts to get the speed to at least Mach 5 and increase the weapon's "survivability" from air defences. "In turn this may encourage other states to follow suit, or to try to access Russian technology or systems," the report's authors wrote. "Tehran has already claimed it is pursuing supersonic missile technology, and Moscow could offer a path to expediting this."

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Hypersonic Iran: Before the war in Ukraine, Russian President Putin had boasted of the astonishing capabilities of the Kh-47 Kinzhal hypersonic missiles, with alleged speeds of Mach 10, or 12,300kph, although some reports suggested it was a third of that. Up to 10 Kinzhals have been shot down by Ukraine's air defences but Russia is

attack munition, furthermore, will almost certainly encourage others to seek similar weapons as an entry-point for a long-range land-attack capability."

Source: <https://www.msn.com/en-ae/news/world/iran-eyes-russias-hypersonic-missile-technology/ar-AA1jEt13>, 09 November 2023.

BALLISTIC MISSILE DEFENCE

ISRAEL

Israel Says Ballistic Missile Destroyer Hits First 'Target'

The Israeli military said its latest hypersonic ballistic missile interceptor had for the first time yesterday destroyed a "target" headed toward Israel from the Red Sea, highlighting potential attacks from Yemen. The announcement of the landmark launch of the Arrow 3 interceptor came shortly after Yemen's Iran-backed Huthi rebels said they had fired "a barrage of ballistic missiles" at Israel.

Source: <https://www.themalaysianinsight.com/s/471095>, 10 November 2023.

NUCLEAR ENERGY

CZECH REPUBLIC

3 Energy Companies Compete to Build a New Nuclear Reactor in the Czech Republic

Three energy companies including U.S. Westinghouse, France's EdF and Korea's KHNP, have submitted their final bids to build the Czech Republic's newest reactor at the Dukovany nuclear power station as the country strives to become more energy independent and wean itself of fossil fuels. State-controlled power company CEZ said it would assess the bids for the multi-billion-dollar contract before sending its decision to the government for final approval of

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Unlike its western neighbors Austria and Germany, the Czech Republic is doubling down on nuclear power and renewable energy sources after deciding to phase out coal as a fuel for energy generation by 2033 in order to reduce carbon emissions.

the winner. The three companies that met Tuesday's deadline already submitted preliminary bids in November in a tender launched earlier in March 2022 after passing a Czech government security appraisal.

The new reactor should become operational by 2036. The winner of the lucrative contract will then have an option to build three more nuclear reactors in the country. Last year, the Czech government excluded Russia's energy giant Rosatom and China's CNG

from the tender process on security grounds. Prime Minister Fiala said Russian participation in the project, which is critical for the Czech Republic's energy security, was "unimaginable" following the Kremlin's invasion of Ukraine. The new reactor

will complement Dukovany's four 510-megawatt units that were completed in the 1980s.

Last year, the government originally estimated the project would cost around 6 billion euros (\$6.4 billion) but that could change due to high inflation driven by soaring energy prices. The Czech Republic already relies on six nuclear reactors to generate more than a third of its total electricity. Besides the four in Dukovany, state-controlled power company CEZ operates another two 1,000-megawatt reactors at the Temelin plant. CEZ will be in charge of the tender. Unlike its western neighbors Austria and Germany, the Czech

Republic is doubling down on nuclear power and renewable energy sources after deciding to phase out coal as a fuel for energy generation by 2033 in order to reduce carbon emissions.

Another two European Union countries in Central Europe, Slovakia and Hungary, have also been working to expand nuclear power production while another neighbor, Poland, has selected Westinghouse to build its first nuclear

power plant as part of an effort to burn less coal and gain greater energy independence. In a separate deal, CEZ had signed a deal with U.S. energy giant Westinghouse Electric Co. to supply nuclear fuel for the Dukovany nuclear plant, eliminating dependence on Russia for such fuel.

Source: <https://qz.com/3-energy-companies-compete-to-build-a-new-nuclear-react-1850975827>, 31 October 2023.

ESTONIA

IAEA Reviews Estonia's Nuclear Power Infrastructure Development

Estonia has developed a comprehensive assessment of its nuclear power infrastructure needs to enable the government to decide whether to launch a nuclear power programme, an IAEA team of experts said. The IAEA team concluded an eight day mission to Estonia to review the country's infrastructure development for a nuclear power programme. The Integrated Nuclear Infrastructure Review (INIR) was carried out at the request of the Government of Estonia.

Estonia, seeking to reach net-zero emissions by 2050, is looking at nuclear power as a reliable and low carbon option to diversify its energy mix by 2035 when the country plans its phase-out of domestic oil shale. The plans for nuclear energy are focussed on the deployment of SMR as a solution for climate-neutral electricity production and security of energy supply. SMRs are the focus of increased global interest due to their ability to meet the need for flexible and affordable power generation for a wider range of users.

A Nuclear Energy Working Group was established in 2021 by the government to review the nuclear infrastructure required for the nuclear power programme. Its comprehensive report – planned

to be finalized in December 2023 – will provide recommendations to support the Government to make a decision regarding the nuclear energy programme. The INIR team comprised of three international experts from Brazil and the United Kingdom, as well as six IAEA staff. It reviewed the status of 19 nuclear infrastructure issues using the IAEA evaluation methodology for Phase 1 of the Milestones Approach which evaluates the readiness of a country to

make a knowledgeable commitment to a nuclear power programme.

The mission team noted good practices in Estonia's approach. It has commissioned a comprehensive set of detailed studies with the support of external experts as part of its assessment to be presented to the Government to support a knowledgeable decision. The team also said the country's strategy to support future human resource development aims to ensure the short-term and long-term success of the nuclear power programme. Finally, the inclusion of a review of possible locations for the geological disposal of spent nuclear fuel in its assessment will help provide greater confidence to the public in Estonia's

ability to manage waste disposal...

Source: <https://www.iaea.org/newscenter/pressreleases/iaea-reviews-estonias-nuclear-power-infrastructure-development>, 30 October 2023.

GENERAL

UN Nuclear Chief Says Nuclear Energy Must be Part of the Equation to Tackle Climate Change

Nuclear energy must be part of the equation to tackle climate change, the U.N. nuclear chief said. Climate-warming hydrocarbons still supply more

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Nuclear energy must be part of the equation to tackle climate change, the U.N. nuclear chief said. Climate-warming hydrocarbons still supply more than 80% of the world's energy, even after the trillions of dollars spent in the green transition of the past 20 years, Rafael Grossi, director general of the IAEA told the UNGA.

than 80% of the world's energy, even after the trillions of dollars spent in the green transition of the past 20 years, Rafael Grossi, director general of the IAEA told the UNGA. Over a quarter of the electricity from nuclear power is low-carbon electricity and global carbon dioxide emissions would be considerably higher without nuclear power, Grossi said. Carbon dioxide is released when fossil fuels such as oil, coal or natural gas are burned for power. In the atmosphere, the gas traps heat and contributes to the warming of the climate.

Source: <https://apnews.com/article/iaea-nuclear-energy-fossil-fuels-climate-change-bffe9fec978c8dbd8040746c526e0dd5>, 09 November 2023.

INDONESIA

Plans Announced for Nuclear Power Plants in Indonesia

US-based NuScale Power and ThorCon Power are planning to construct new nuclear power plants (PLTNs) in Indonesia. NuScale Power plans to build SMRs, which will generate up to 300 MW(e) per unit. SMRs will connect to the existing power grids. They are expected to commence operations by 2032-2039. Meanwhile, ThorCon Power expects to begin the operations of thorium-based PLTNs by 2030. The power generated by SMRs is equivalent to one-third of the power generated by conventional nuclear power plants while leaving less of a carbon footprint.

Source: <https://powerline.net.in/2023/10/30/plans-announced-for-nuclear-power-plants-in-indonesia/>, 30 October 2023.

indonesia/, 30 October 2023.

UK

The Next Generation of Nuclear Power Plants

Lancaster University hosts one of the United Kingdom's most robust university-affiliated nuclear centers, which boasts internationally recognized capabilities. Joshua Findley, a postgraduate researcher, is currently in the process of researching

thermodynamic measurements of materials destined for the next generation of nuclear reactors. He inherited a Hitachi STA7200 that the university bought back in 2015, which had only been used a handful of times since it was first purchased. Thus, to get the instrument back in spec to collect novel data to help him publish papers and complete his PhD, he contacted Hitachi's customer support team for help.

A Multi-Functional Thermal Analyzer: Lancaster University is home to an STA7200, an integrated thermodynamic analyzer that seamlessly blends

thermogravimetric analysis (TGA) and differential thermal analysis (DTA) into a single apparatus for simultaneous measurement. This instrument, procured in 2015, was only really used for thermogravimetric testing (TG) before Joshua arrived in 2021. The DTA capabilities of the device

had not been previously explored. Joshua felt confident in its ability to deliver highly precise and accurate measurements, thanks to the STA7200's remarkable sensitivity and performance, as reported by his colleagues.

Developing the Next Generation of Nuclear Power Plants: Joshua's research focused on the

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fusion of various molten salts, and he intended to use the STA7200 to understand more about their behaviors during melting, both liquidus and solidus and solid-solid phase diagrams. The objective of his study is to evaluate how molten salts can function as a primary coolant for the next generation of nuclear power plants. Molten salts offer benefits such as their low vapor pressure and high boiling point, allowing reactors to operate at elevated temperatures and reduced pressure, thereby enhancing efficiency and safety.

A comprehensive grasp of the melting and cooling characteristics of these salts is crucial to assess their effectiveness. The STA7200 utilized by Joshua enables precise determination of the temperatures at which his molten salts undergo melting and crystallization, as well as the accurate measurement of heat capacity for various molten salts. ... Joshua points out, "The impressive baseline stability of the STA7200 makes my life easier when it comes to data processing."

Source: <https://www.azom.com/article.aspx?ArticleID=23094>, 07 November 2023.

USA

Nebraska Lawmakers Consider Ways to Expand Nuclear Energy Production

As a new form of nuclear technology grows more popular across the globe, officials in Nebraska are looking for ways the state can tap into it as a source of energy production. State lawmakers met to discuss the feasibility of building small modular nuclear reactors as a means of generating electric power across the state. Experts testified that such reactors are a clean and efficient method of energy production. ... Small modular reactors are the new type of nuclear reactor under consideration around the world. Utilities say these smaller reactors offer several advantages over

the much larger traditional reactors by requiring less space, costing less to build and providing greater flexibility in where they can be built and how much electricity they generate.

Critics, however, say they remain unproven and carry the baggage of any nuclear reactor: no great solution for radioactive spent fuel, potential high costs to build and potential nefarious use of nuclear material. A nuclear power plant hasn't been built in Nebraska in 50-some years. The only plant still in operation is Cooper Nuclear Station near Brownville. Tom Kent, CEO of the Nebraska Public Power District, said the energy contained within the Cooper plant's reactor core is difficult

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to fathom. The reactor takes fuel from uranium pellets that are roughly the size of a finger, he said. The energy within one pellet is equivalent to about one ton of coal. Small modular reactors may not have the capacity to hold as much energy as a larger plant, but Kent said they use new technology that is more

efficient and better at maintaining the reactor at a safe temperature.

Using funds approved by the Legislature, this year NPPD started searching for potential sites where Nebraska could construct a new reactor. Kent said NPPD has identified several potential locations and is in the process of narrowing down a handful for further analysis. Even with full approval by state government, Kent said the process is long enough that Nebraska probably won't see a small nuclear reactor built for at least another decade. He said states that are the furthest along in development are still only midway through their licensing process.

Lawmakers asked Kent whether there was anything the state could do to ease this process, but Kent said NPPD is happy with the help it has received from the Legislature so far. Some ideas he suggested included streamlining the permit process or improving the state's labor shortage to ensure the reactors would have enough workers.

"I'm not sure there needs to be drastic changes," Kent said. There are multiple benefits associated with nuclear energy. Nuclear engineer Jan Bostelman said it doesn't rely on continuous supply chains like coal or water, and takes up a lot less land than other energy plants. She said nuclear plants have also been linked to increased economic development in their communities, creating more high-paying jobs and paying higher taxes. Kent said nuclear energy also doesn't produce the same emissions that fossil fuel-based energy does. Since NPPD and other local power companies have set a goal to be carbon neutral within the next two decades, he said, it's critical that nuclear energy be part of the solution. "To accomplish the goals we're talking about as a society, nuclear power's got to be part of that," Kent said.

Source: https://omaha.com/news/state-regional/government-politics/nebraska-lawmakers-consider-ways-to-expand-nuclear-energy-production/article_4dbfdf62-74d3-11ee-bbc7-a74dcd4589d2.html, 29 October 2023.

NUCLEAR SECURITY

RUSSIA

Russia Says Ukrainian Drone Rammed Nuclear Waste Storage Facility of Kursk Nuclear Power Plant

A Ukrainian drone rammed a nuclear waste storage facility of the Kursk nuclear power plant, Russian Foreign Ministry spokeswoman Maria Zakharova said. Ukrainian armed forces purposefully attacked the Kursk nuclear power plant with three drones. One armed with explosives, crashed into the wall of the storage facility and two fell on the plant's administrative buildings, Zakharova said in a statement.

According to preliminary data, components used to build drones were supplied by Western

countries, she said, adding that such actions "could not be carried out without approval if not direct instruction of the Western supervisors." Zakharova criticized Kyiv and said, "What happened proves that it has no boundaries," even in issues of acts of nuclear terrorism. "Apparently they realized that a full-scale nuclear catastrophe could have become a consequence of the UAV (unmanned aerial vehicle) raid, which would have

affected the territories of many countries," she said. Zakharova urged all governments to come out with a strong condemnation of Kyiv's "extremely dangerous" actions, which may lead to "irreparable consequences." "Relevant international organizations, environmental non-government organizations and civil society should also

give an appropriate assessment of this act of terrorism," she said.

Source: <https://www.aa.com.tr/en/asia-pacific/russia-says-ukrainian-drone-rammed-nuclear-waste-storage-facility-of-kursk-nuclear-power-plant/3036552>, 29 October 2023.

NUCLEAR SAFETY

GENERAL

Successful Integration of Safety Review and Capacity Building within the IAEA SEED Service

Fifty participants from 29 countries discussed the progress of the SEED (Site and External Events Design) review service and the capacity building programme on the site and design for nuclear installations, during a recent technical meeting at the IAEA Headquarters in Vienna, Austria. Specific draft documents that related to SEED, were also assessed. The meeting focused on improvements to be implemented, based on the feedback of experiences of countries, including the seven pilot countries — Egypt, Kazakhstan, Kenya, Morocco, Nigeria, Poland, and Uzbekistan.

The new revised and enhanced structure of the

SEED guidelines document was also presented to the participants. It includes guidance on how to conduct a SEED workshop, types of training that will enhance the safety of nuclear power plants, self-assessment questionnaire as well as areas covered by SEED review missions. "The SEED programme, backed by its updated guidelines and all-encompassing training endeavours, stands as proof of the collective dedication to ensure the safety and sustainability of our support to countries interest in nuclear power programmes to meet the increased energy demands," said Paolo Contri, Head of the IAEA External Events Safety Section.

Achieving consensus on the training documents and SEED guidelines was among the main objectives of the expert meeting that took place from 9-13 October 2023. National presentations gave an insight on the education and training conducted on nuclear site safety for regulatory bodies in embarking countries. The exchanges also covered other IAEA working documents including 'Self-Assessment Questionnaires for Site Selection and Evaluation', and 'Hands-on Practice Module for Site Safety Review.'

The IAEA, External Events Safety Section (the EESS) supports Member States, upon request, to achieve a high level of safety in relation to external events such as earthquakes, floods, typhoons, landslides, and events induced by human activities, which is undertaken by means of safety reviews, advisory services and capacity building based on the IAEA

safety standards and technical documents. "Capacity building is instrumental in this process and reflected as an integral part of the SEED mission planning," said Contri.

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The EESS Extra Budgetary Project: Recently, the IAEA has embarked on a revision of the SEED guidelines with the objective of streamlining its site and design review processes and enhancing capacity-building services, all under the framework of a specific EESS project aimed to pursue the integration of capacity building and a safety review service successfully. Since 2020,

the EESS has been implementing activities under an extra budgetary project that is co-funded by the European Commission and various Member States. This project played a vital role in supporting site-safety-related capacity building to countries embarking on nuclear power programmes to meet their energy demand and include — e-learning tools, self-assessment and training documents, as well as country-specific and training workshops.

Hyun Woo Lee, the Project Manager said that: "the project deliverables have been developed, tested, and optimized through consultancy meetings and national and international training workshops with seven pilot countries." Experts' support provided

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by Argentina, Hungary, Israel, Pakistan, South Korea, Türkiye, UAE, UK and the USA has also enabled tangible outcomes from the training activities conducted to increase awareness of safety in site selection and design as well as the

importance of knowledge and skill sharing in this specialised area.

In his remarks, highlighting the importance of such exchanges, Kenneth Anakoli, Head of Mombasa Regional Office from the Nuclear Power and Energy Agency in Kenya said: "through specialized training as a pilot country, we have gained invaluable expertise in crucial areas like regulatory competence for nuclear site safety, siting authorization process for nuclear installations, hydrological hazards and assessment, hands-on practice on safety analysis report and site evaluation report preparation, and public involvement. This knowledge empowers us to navigate complex processes, conduct informed siting studies, and positions our nation as a knowledgeable and capable authority in ensuring nuclear safety and compliance." Romania has also joined the ranks of pilot countries benefiting from the SEED review and capacity building programme. With their pursuit of SMR technology, the SEED programme will play a pivotal role in assisting Romania as they embark on this innovative path.

SAR Review Guidance Document Set to Launch in 2024: A significant milestone was reached during the meeting with the successful completion of the Safety Analysis Report (SAR) Review Guidance for Site Characteristics. This guidance is scheduled for publication in 2024 and is expected to serve as a valuable reference for both regulators and interested organizations in Member States, particularly those embarking on their first nuclear programmes, in the establishment of their own SAR review procedures...

Source: <https://www.iaea.org/newscenter/news/successful-integration-of-safety-review-and-capacity-building-within-the-iaea-seed-service>, 02 November 2023.

JAPAN

IAEA Wraps Up Safety Review of Fukushima Treated Water Discharge

The IAEA on 27 Oct (Friday) wrapped up its safety review of Japan's discharge of treated radioactive water from the crippled Fukushima nuclear plant into the sea, and plans to compile a report on its latest four-day mission by year-end. Seven IAEA officials and experts from nine of the 11 task force member countries

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During their stay, the members of the mission also exchanged opinions with officials of the Japanese government, plant operator Tokyo Electric Power Company Holdings Inc. and the Nuclear Regulation Authority over the operation of the discharge facility at the plant and environmental monitoring procedures. Since August, the plant operator has ejected about 15,600 tons of water treated with a liquid processing system that removes most radionuclides except tritium. The tritium is diluted with seawater, leaving it with a concentration level one-40th of that permitted under Japanese safety standards, before it is discharged.

Source: <https://energycentral.com/news/iaea-wraps-safety-review-fukushima-treated-water-discharge>, 28 October 2023.

SMALL MODULAR REACTORS

EU

European Nuclear Energy Forum 2023 Discusses Benefits of European SMRs Initiative

European nuclear sector stakeholders have been meeting with policymakers this week for the annual European Nuclear Energy Forum (ENEF) in Bratislava. The event confirmed an increasing interest in nuclear technologies in some EU countries, and their potential role in meeting Europe's decarbonisation targets and security of energy supply objectives.

Alongside this meeting, the EU Commissioner for Energy Kadri Simson took part in meetings with the European nuclear industry, nuclear safety regulators as well as Member States of the Nuclear Alliance to discuss the challenges for the establishment of an industrial alliance on SMRs and the potential benefits.

Acknowledging the wide stakeholder support for setting up a European Industrial Alliance on SMRs, Commissioner for Energy Kadri Simson said: 'I will work with my colleagues in the Commission towards the establishment of a

European Industrial Alliance on SMRs in the earliest possible timeframe. Those Member States that decide to rely on nuclear energy as part of their energy mix should be able to deploy SMRs by the next decade and use their potential for their decarbonisation efforts. I want to ensure that the EU has a policy on SMRs that brings everybody together and does not create divisions between different low-carbon technologies. I note the preparatory work accomplished since the first

European strategic workshop on SMRs in June 2021.

Following on opening statements by the Slovak and Czech prime ministers, and an introductory speech from the Commissioner, the ENEF received a video message from Ukrainian Deputy Minister of Energy Yaroslav Demchenkov on behalf of Energy Minister German Galushchenko. Discussions also looked at the challenges of diversifying suppliers in the nuclear supply chain in order to minimise Europe's dependence on supplies from unreliable providers of uranium, nuclear fuels, spare parts and services.

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Commission speakers underlined that Member States have the autonomy to choose their national energy mix, and that the Commission's priority is to ensure that nuclear energy is used in accordance with the highest nuclear safety standards and makes use only of reliable supplies from trustworthy partners and the most advanced technologies....

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Source: https://energy.ec.europa.eu/news/european-nuclear-energy-forum-2023-discusses-benefits-european-small-modular-reactors-smrs-2023-11-07_en,07 November 2023.

GENERAL

Belgium, Italy, Romania, US Unite to Boost SMR Research

Five industrial and research actors from Belgium, Romania, Italy and the US want to speed up the development of SMRs, a memorandum of understanding between the five signed on 8 November. Romanian and Belgian nuclear

research centres RATEN and SCK CEN, Italian nuclear company Ansaldo Nucleare and engineering and energy R&D agency ENEA, together with the American Westinghouse Electric Company, have agreed to set up a consortium to work towards the development of SMRs with lead-cooled fast reactors that can be commercialised in Europe.

The agreement was signed in the presence of Belgian Prime Minister De Croo, Romanian President Iohannis, and representatives of the Italian and American embassies in Belgium. The collaboration “begins with the demonstration of Lead Fast Reactor Technology, showcasing its potential,” SCK CEN said in a press release. It added that the first Belgian lead-cooled SMR model will be completed around 2035-40. “Belgium is teaming up with the US, Romania and Italy to put SMRs on the market to provide clean and cheap energy. The time to take the lead in the fight against global warming is now,” De Croo said on X. While the Belgian government is not united on the nuclear question, it commissioned SCK to study innovative SMRs and gave it €100 million for its research last year. ...

Nuclear Phase-Out: Per its nuclear phase-out law, Belgium shut down two nuclear reactors (Doel 3 and Tihange 2) while two others that were to be shut down in 2025 (Doel 4 and Tihange 3) were extended. In October 2022, a study

conducted by the research organisation EnergyVille confirmed that combining new SMRs and increased offshore wind power was the cheapest option for Belgium to reach climate neutrality by 2050 at the lowest societal cost while guaranteeing supply security but without reducing industrial production.

However, as some observers have already pointed out, the nuclear phase-out law is at odds with the government funding SMR research. “Although the Belgian government may have commissioned the study of SMR for Belgium, this is still at odds with the Nuclear Exit Law. To achieve a successful succession project, this will require further adjustments,” SCK wrote.

According to the Nuclear Forum, which represents companies and organisations linked to nuclear, in August 2023, nuclear power, which means 46% of the electricity mix, and renewable energies (32%) have made it possible for 78% of Belgium’s electricity to be decarbonised, with wind energy making up for 13,5% of the renewable energy used. ...

According to a survey by the Nuclear Forum, published by RTL, 69% of respondents believe that the best combination for electricity production in Belgium is a mix of nuclear and renewable energy. The survey also found that 85% think nuclear energy should be part of the country’s energy mix after 2025, while 87% favour Belgium investing

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The survey also found that 85% think nuclear energy should be part of the country’s energy mix after 2025, while 87% favour Belgium investing in the development and construction of SMRs. In other words, the nuclear phase-out law, passed under pressure from the Greens, no longer seems to reflect the will of the people, which has evolved with the recent crises that have caused prices to rise and threatened the security of supply. Nuclear energy could thus become a major talking point ahead of the federal elections in June 2024.

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Source: <https://www.euractiv.com/section/politics/news/belgium-italy-romania-us-unite-to-boost-small-modular-reactors-research/>, 09 November 2023.

UKRAINE

Energoatom to Produce Equipment for SMRs

NAEC Energoatom plans to build in Ukraine a plant for the production of basic equipment for SMR using the technology provided by the U.S.-based Holtec. "Energoatom plans to implement an important project for the construction of a plant in Ukraine, which will manufacture the main equipment for small modular reactors using Holtec's SMR technology, including the reactor body," the report says. Energoatom expects that the plant will ensure the construction of about 3,000 MW of SMR capacity in Ukraine and create thousands of new jobs. As reported, Energoatom and Holtec International plan to build a plant in Ukraine where containers for spent fuel from nuclear power plants will be produced.

Source: <https://www.ukrinform.net/rubric-economy/3784608-energoatom-to-produce-equipment-for-small-modular-nuclear-reactors.html>, 09 November 2023.

NUCLEAR COOPERATION

FRANCE-KAZAKHSTAN

France Enhances Nuclear Ties with Kazakhstan

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French President Macron agreed to a joint declaration with President Tokayev of Kazakhstan to promote trade and cooperation in nuclear energy and strategic minerals during Macron's visit to the Central Asian nation last Wednesday.

Kazatomprom, the largest uranium producer in the world, based in Kazakhstan, and Framatome, a French nuclear reactor constructor, also signed an agreement on cooperation in the nuclear fuel cycle.

Tokayev said: "Kazakhstan is the world's top uranium producer, contributing over a quarter of nuclear fuel consumed in Europe. With nuclear

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power comprising 63% of France's energy sector, there is vast potential for further cooperation." France is one of Kazakhstan's largest trading partners and has invested \$18.7bn (€17.51bn) in the Kazakh economy over the past 15 years. ...

Kazakhstan, already the largest uranium-producing nation in the world, accounting for 42% of world production, may develop its own nuclear power industry in the near future. At the beginning of September, it was decided that the nation will hold a referendum soon on whether to build its first nuclear power plant. ... The precise date for the referendum will be announced "in due course". French energy giant EDF is one of four nuclear reactor vendors shortlisted to supply Kazakhstan's first nuclear power plant.

Partnership on nuclear is part of a wider strategy to enhance political ties between the two nations. ... Despite alignment with France, Kazakhstan is still keen to maintain ties with Russia. A source close to the issue told *Euractiv* that the “Kazakhs cannot risk being sanctioned by the EU, their main trading partner, by joining forces with Russia. On the other hand, aligning only with an EU country like France would send a very unpleasant signal to Moscow.”

Source: <https://www.power-technology.com/news/france-and-kazakhstan-strengthen-nuclear-ties/?cf-view>, 07 November 2023.

USA-PHILIPPINES

US Optimistic on Signing of ‘123 Nuclear Agreement’ with PH

The government of the US is optimistic on the signing of a historic ‘123 Agreement’ on nuclear power with the Philippine government that could help Filipino investors gain access not just to cutting-edge nuclear power technologies – including those of the targeted deployment of SMRs; but will also enable them to get their hands on financing that can help concretize these projects.

In an interview on the sidelines of the recent United Airlines inaugural flight to San Francisco, California, US Ambassador to the Philippines MaryKay L. Carlson stated “we are very optimistic that we would be able to reach an agreement on the 123 signing,” hinting that there is a target to cement this landmark deal at the Asia Pacific Economic Cooperation (APEC) Leaders’ Summit in San Francisco, California this month. She qualified that the working timeframe on the signing is

“sometime before the end of the calendar year and we’re hopeful that it can be done at the APEC, that would be great.”

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into ‘peaceful nuclear cooperation agreement’ with any country that will be availing of technology transfer from American nuclear companies – and such collaboration will also cover those on technical assistance, scientific research and safeguard discussions.

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The DOE previously hinted that the ‘123 nuclear agreement’ will be firmed up in conjunction with other nonproliferation legal frameworks, primarily the Treaty on the NPT, an international agreement which is promoting the safe use of nuclear technologies. Major.

The US will be this year’s host to the APEC Economic Leaders Week from November 11-17; and this major global event is to be attended both by Philippine President Marcos and US President Biden as well as the other heads of state in the Asia Pacific region. Section 123 of the US Atomic Energy Act warrants the US government’s entry

the Treaty on the NPT, an international agreement which is promoting the safe use of nuclear technologies. Major Philippine companies – including Manila Electric Company (Meralco) and Aboitiz Power Corporation – have already started navigating

the nuclear power investment terrain as they envision this to be a critical component of the country’s future energy mix. These Filipino firms have been setting their sights on possible US nuclear power tech providers – the likes of NuScale Power and Ultra Safe Nuclear – on their planned rollout of SMR technologies, but this will only be possible if the 123 deal with the US has already been firmed up by the leaders of both governments.

Once the 123 Agreement is signed, the Philippines will be joining the league of other countries that

already have this kind of agreement with the US. For Southeast Asia, in particular, it has been Indonesia and Vietnam that so far sealed this kind of agreement with the US.

Deployment of nuclear power technology is a key addition in the power mix that the Marcos administration has been fervently pushing for – and this is a key component of the energy future anticipated taking off in the country’s power mix starting year 2034.

For Southeast Asia, in particular, it has been Indonesia and Vietnam that so far sealed this kind of agreement with the US. Deployment of nuclear power technology is a key addition in the power mix that the Marcos administration has been fervently pushing for – and this is a key component of the energy future anticipated taking off in the country’s power mix starting year 2034.

Many of the SMR technologies currently being experimented on and under pilot have been suffering delays and cost overruns, but the global nuclear industry is sounding off hopes that licensing and commercial deployment can finally advance within 2030-2031 timeframe. In the case of the Philippines, it has been re-taking baby steps on the sphere of nuclear power development, but the targeted ‘123 agreement’ with the US is a key milestone that the government has been aiming for to help Filipino investors advance on their aspired project rollouts.

As things stand today, the future of nuclear power in the Philippines is still seen to depend largely on the passage of necessary legislative policies on nuclear power – and the proposed measure is still going through maze of deliberations and targeted approval in Congress.

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Bluntly, the issues and concerns when it comes to nuclear power developments already turned too long and varied for the Philippines – from public

acceptance; humongous upfront capital investment which became a dilemma to many nuclear new builds; then there are also recycling and storage/disposal concerns on spent fuel; safety and equipment redundancy installation as well as siting issues; nuclear liability and insurance coverage; upskilling and reskilling of human resources and enabling of domestic expertise on nuclear power operations; and most importantly, the tricky policy and regulatory frameworks.

And in the restructured sphere of the Philippine energy sector that is now largely private sector-driven, nuclear power facilities will also need to find their place in a merchant market set-up or on competitive bilateral contracting versus other fuels for power generation.

Source: [https://mb.com.ph/2023/11/5/us-optimistic-on-signing-of-](https://mb.com.ph/2023/11/5/us-optimistic-on-signing-of-123-nuclear-agreement-with-ph)

123-nuclear-agreement-with-ph, 06 November 2023.

NUCLEAR DISARMAMENT

GENERAL

Nuclear Ban Treaty Members to Meet in November

States-parties to the 2017 Treaty on the Prohibition of Nuclear Weapons (TPNW) will hold their second meeting in New York on Nov. 27-Dec. 1. Amid the crisis facing the international arms control and disarmament regime, they are expected to review and continue implementing their plans for a total ban on nuclear weapons. The TPNW, which entered into force on Jan. 22, 2021, bans states-parties from involvement in any nuclear weapons activities, including the use,

threat of use, production, development, possession, and stationing of these weapons. Spearheaded by non-nuclear-armed states and civil society groups, the treaty originated from their frustration over the long stalemate among nuclear-weapon states to engage in serious nuclear disarmament as called for by the NPT.

At their first meeting, in June 2022, TPNW states-parties produced two documents aiming to advance the treaty, a 50-point action plan and a political statement. They established three informal working groups to make progress during the intercessional period on important topics such as nuclear disarmament verification, victim assistance, environmental remediation, and universalization of the treaty. In addition, the action plan agreed to create a scientific advisory group, to implement gender provisions in the treaty, and to promote TPNW complementarity with existing treaties.

For the November meeting, each working group is preparing reports on their respective intersessional activities. The meeting is expected to issue a final document, according to the provisional agenda and government officials. The “expectation of all the parties is to continue implementing the plans [and] having a meeting that reviews what was agreed in 2022 and its implementation,”

María Antonieta Jaquez, coordinator for disarmament, nonproliferation, and arms control for the Mexican Foreign Affairs Secretariat, told *Arms Control Today*. She suggested that the

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The states-parties would continue following the 50-point action plan from 2022 because it “cannot be reinvented or rewritten every year.” One key focus is universalization of the treaty. “The treaty has to continue growing,” Jaquez said. She emphasized that the participation of all TPNW states-parties, as well as states that remain outside the treaty, should be “all welcomed” and “it is important that we have as many stakeholders [join the treaty] as possible.

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Meanwhile, deepening geopolitical divides continue casting shadows over the non-proliferation and disarmament regimes. After the first TPNW meeting concluded, two NPT-related meetings failed to achieve a consensus and concluded with no substantive final documents.

A contentious issue likely to be raised in November is how TPNW states-parties interpret the treaty provisions. In April 2023, Russia conducted a test launch of a missile that can carry nuclear warheads from a test site in Kazakhstan, an active TPNW member state. Although the treaty bans assistance with nuclear weapons development, it leaves the definition of “assistance” open to

interpretation. Since the last meeting of states-parties, seven more states have signed the treaty, bringing the total number to 93 states, and four more states have ratified it, bringing the total to 69. Juan Ramón de la Fuente Ramírez, Mexico’s ambassador to the UN, will serve as president of the second meeting of TPNW states-parties.

Source: <https://www.armscontrol.org/act/2023-11/news/nuclear-ban-treaty-members-meet-november,03November2023>.

ISRAEL

Iran Calls for Nuclear Disarmament of Israel

Iran has called on the UNSC to immediately move to dismantle Israel's nuclear weapons following dangerous remarks by an Israeli minister who called for nuking the Gaza Strip. Iranian Foreign Minister Hossein Amir Abdollahian made the remarks in a post on the X platform, formerly Twitter. His post comes after Israeli Heritage Minister Amichai Eliyahu urged the Israeli government to drop a nuclear bomb on the Gaza Strip, one of the most densely populated areas of the world with a population of 2.3 million. Speaking in an interview, Eliyahu claimed that there were "no non-combatants" in the besieged strip and that using a nuclear bomb on the Palestinian enclave was one of the possibilities."

Amir Abdollahian said the remarks are indicative of Israel's failure. "Israel's regime minister's statement to use atomic bomb shows the real defeat of the regime against the resistance," he said. The Iranian foreign minister added, "The UN Security Council and the IAEA must take immediate and uninterrupted action to disarm this barbaric and apartheid regime. Tomorrow is late. Full responsibility for this genocide lies with the White House."

Eliyahu's blatantly genocidal remarks are in harmony with statements by other senior Israeli officials. Earlier, Israeli President Herzog said "the entire nation" in Gaza is responsible for the

October 7 attack by the Palestinian resistance groups, implying that all the population of Gaza should be collectively punished. Also, Israeli War Minister Yoav Gallant went so far as to describe the people of Gaza as "human animals."

... Following Eliyahu's remarks, Israeli officials sought to falsely portray the extremist minister as crazy who does not represent Israel's strategic thinking. While it's obvious that the Eliyahu bomb is not going to be dropped on Gaza, the

Israeli nuclear arsenal remains a strategic threat to all countries of the region, especially Egypt, Saudi Arabia, Turkey, and Iran. Israel has shown that its nuclear arsenal is ready to be used against civilians who are already stateless and besieged.

Over the last month, Israel used a wide range of "conventional" weapons – some of which are internationally prohibited such as white phosphorous bombs- to wreak unbelievable havoc on civilians in Gaza all while laying strict siege on the enclave. Some military estimates say that the amount of ammunition Israel dropped on Gaza is equal to more than nuclear bombs. And the civilian casualties are already exceeding 10,000. So, if despite all this death and destruction, Israel feels it needs an actual nuclear bomb to completely destroy Gaza, then how it will feel when confronting a well-organized, fully armed army? ...

Source: <https://www.tehrantimes.com/news/491040/Iran-calls-for-nuclear-disarmament-of-Israel,06November2023>.

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RUSSIA

EU Deplores Russia's Decision to Revoke CTBT

The EU announced on 2 November that it deplores **Russia's** decision to revoke the CTBT. "It is crucial for international peace and security that all States fully observe the moratorium on nuclear weapon test explosions or any other nuclear explosion, and refrain from any action contrary to the object and purpose of the Treaty," the European Commission said in a statement that maintained the CTBT is a crucial instrument to nuclear disarmament and non-proliferation, which established a powerful norm against nuclear testing that is respected worldwide.

"The **European Union** calls on Russia to continue to respect the purpose and the objective of the Treaty," it said. "The European Union remains fully committed to promoting the entry into force and universalisation of the **CTBT**, and to pursuing its objectives for a world free of nuclear testing." Russia revoked its ratification of the CTBT on 2 November 2023 after President **Putin** signed a relevant bill. The changes were proposed by the Foreign Ministry to match **Russia's** position with the US.

The US and **Russia** signed the 1996 agreement before Moscow went through the ratification process while the US refrained. Russian Deputy Foreign Minister **Sergey Ryabkov** said Oct. 10 that even after ratification is revoked, Russia remains a signatory to the treaty. Deputy Foreign Ministry spokesman **Alexey Zaytsev** separately told Anadolu that one of the advantages the treaty gives to signatory states is that it provides access

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to the verification data mechanism. Previously, the Russian parliament had voted for the bill that repeals Article 1 of the law On Ratification of the CTBT, canceling the ratification.

Source: <https://www.aneews.com.tr/world/2023/11/02/eu-deplores-russias-decision-to-revoke-comprehensive-nuclear-test-ban-treaty>, 02 November 2023.

URANIUM PRODUCTION

USA

Energy Fuels Preparing 4 Uranium Mines for Production

US-based critical minerals company Energy Fuels is preparing four of its convention uranium mines for production, CEO **Mark Chalmers** reported. Together, these mines have the ability to produce between 1 million and 1.3-million pounds a year of uranium, excluding potential vanadium credits of about 2-million pounds a year. "We expect to begin production at one or more of these mines by early 2024, with the mined material being stockpiled at the White Mesa mill [in Utah] until a sufficient quantity is accumulated to justify a mill campaign, which is expected to occur in late-2024 or early-2025, subject to contract requirements and successful operations," he said.

Chalmers added that there were "significant tailwinds" driving uranium markets, including higher prices and government policies. "Uranium spot prices are up over 50% in 2023, which is improving our expected contract sales prices, increasing the value of our significant inventories, and increasing the value of our resources. At the

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same time, uranium spot markets are very tight, considerable money is flowing into the sector, geopolitical factors and security of supply are paramount, and market prices remain significantly at or below the levels needed to incentivise large-scale new production and below inflation-adjusted highs. These dynamics could cause prices to continue to rise higher, perhaps significantly so," he commented in a statement accompanying Energy Fuels' third-quarter results.

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During the September quarter, the company completed the sale of 180 000 lb of uranium oxide (U₃O₈) to a major US nuclear utility for \$10.47-million, or \$58.18/lb, which resulted in gross profit of \$5.21-million, or \$28.93/lb U₃O₈. The sale resulted in a gross margin of 50% per pound of uranium. In 2023, Energy Fuels has sold a total of 560 000 lb of uranium for a weighted average realised price of \$59.42/lb, resulting in a gross margin of 54%. The company has no additional contract deliveries scheduled for the remainder of 2023.

WATSS is part of a suite of reactor technologies that are being developed by Moltex Energy Canada that can be deployed individually or jointly: the Stable Salt Reactor - Wasteburner (SSR-W), a fast reactor that uses recycled nuclear waste as fuel; the WATSS recycling process; and GridReserve thermal energy storage tanks. Together, these allow the generation of inexpensive electricity that can be dispatched as needed, complementing intermittent renewable sources such as wind and solar, the company says.

Meanwhile, Chalmers said that the company remained on schedule to complete Phase 1 of its rare earth project at White Mesa mill, which will have capacity to produce 800 t/y to 1 000 t/y of separated neodymium-praseodymium (NdPr) oxide, by early 2024. Phase 1 will have a capital cost of \$25-million. ... Upon successful ramp-up of the modified SX circuit and receipt of sufficient monazite feed, Energy Fuels is expected to be the

first US company in many years with the ability to produce commercial quantities of NdPr oxide, which is a key ingredient in permanent rare earth magnets used in electric vehicles, wind generators and other technologies. The company is also engineering further enhancements at the mill to increase NdPr production capacity to up to about 3 000 t/y by 2026/27 in Phase 2 and to produce separated dysprosium and terbium and potentially other advanced rare earth element (REE) materials in the future from monazite. Phase 3 will potentially consider other REE process streams by 2027/28. At the same time, Energy Fuels is continuing to move its Bahia rare earths project, in Brazil, toward production and secure additional sources of monazite supply to process at the mill for rare earths production, while advancing discussions with end-users.

Source: <https://www.miningweekly.com/article/energy-fuels-preparing-4-uranium-mines-for-production-2023-11-06>, 06 November 2023.

NUCLEAR WASTE MANAGEMENT

CANADA

Moltex Announces Waste Recycling Break through

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W), a fast reactor that uses recycled nuclear waste as fuel; the WATSS recycling process; and GridReserve thermal energy storage tanks. Together, these allow the generation of inexpensive electricity that can be dispatched as needed, complementing intermittent renewable sources such as wind and solar, the company says.

The experiments in Moltex's own uranium-licensed laboratory were carried out using simulated fuel made of uranium dioxide and cerium oxide proportional to levels found in used nuclear fuel: the use of cerium oxide as an analogue to transuranic oxides is supported by literature and thermodynamic modelling. Building from these studies, experiments in secure hot cells at Canadian Nuclear Laboratories facilities are now under way, using "real" used fuel from Candu reactors. "These important experiments not only demonstrate the viability of our waste recycling technology but also reaffirm our unwavering commitment to developing clean energy solutions that combat climate change," Moltex CEO Rory O'Sullivan said.

The company is also currently in discussions with the Canadian Nuclear Safety Commission (CNSC) to formalise a service agreement to help facilitate a bilateral dialogue on its used fuel recycling design. CNSC completed the first phase of the pre-licensing vendor design review of the SSR-W in 2021, and the design has now reached a technology readiness level that "inspires confidence in its feasibility and economic viability", allowing the technical team to reallocate resources towards optimising the WATSS process, Moltex said. This strategic refocus is supported by Moltex partners AtkinsRéalis and IDOM, it added.

The company said it is planning to deploy the first WATSS unit at the Point Lepreau site in New Brunswick, where it has also plans to deploy the

first SSR-W by the early 2030s. NB Power's existing Candu reactor at Point Lepreau is expected to retire around 2040. "Waste recycling is poised to be a game-changer in the nuclear industry, offering a cost-effective and socially acceptable solution to reducing global waste stockpiles prior to final disposal," it said.

Source: <https://www.world-nuclear-news.org/Articles/Moltex-announces-waste-recycling-breakthrough>, 31 October 2023.

CZECH REPUBLIC

IAEA Mission Says Czech Republic Manages Radioactive Waste and Spent Fuel Safely, Encourages Preparations for Nuclear Power Expansion

The Integrated Review Service for Radioactive Waste and Spent Fuel Management, Decommissioning and Remediation (ARTEMIS) review team concluded a ten-day mission to the Czech Republic on 25 October. The mission was requested by the Government to support the Czech Republic's need to meet EU obligations for independent reviews of national frameworks and programmes for managing radioactive waste and spent fuel.

An IAEA mission said the Czech Republic has established a solid basis for the safe and responsible management of radioactive waste and spent fuel. The IAEA team also provided recommendations and suggestions regarding plans for a deep geological repository (DGR) and to ensure readiness for a

potential expansion and prolongation of the country's nuclear power programme.

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The Czech Republic operates six nuclear power reactors at two NPPs in the country's south: four

units at Dukovany NPP and two at Temelin NPP. The Government has initiated a tender for a new unit in Dukovany. It also evaluates the possible construction of one more unit in Dukovany and one or two new units in Temelin. The country is preparing a policy for deploying small and medium-sized (or modular) reactors to reduce carbon emissions in industrial sectors and district heating.

After storage in pools for seven to ten years, spent fuel is kept in dry storage facilities at the NPP sites. A shallow land repository for low-level radioactive waste from both NPPs is located at the Dukovany NPP site. The Government plans to commission a deep geological repository for spent fuel and shortlisted four possible sites in 2020.

A repository for low and intermediate-level waste from medical and industrial use is situated in a former limestone mine, Richard, near Litoměřice in the north of the Czech Republic. Another repository for waste from health, industry and research sectors containing naturally occurring radionuclides can be found near Jáchymov in the northwestern part of the country.

... The team also provided recommendations and suggestions to maintain and further improve the safe management of radioactive waste in the Czech Republic, including: The Government should consider undertaking an in-depth review of the potential impacts on the financing arrangements of an expanded scope and extended duration of the country's nuclear power programme; The Government should consider undertaking a review of the potential impact of radioactive waste and spent fuel from additional nuclear power reactors which could be included in a future State Energy Policy; SÚRAO should consider further enhancing plans and resources for engagement with interested parties, in particular with potential host

The Government should consider undertaking a review of the potential impact of radioactive waste and spent fuel from additional nuclear power reactors which could be included in a future State Energy Policy; SÚRAO should consider further enhancing plans and resources for engagement with interested parties, in particular with potential host communities, to ensure sustained and effective engagement beyond the site selection phase of the DGR.

communities, to ensure sustained and effective engagement beyond the site selection phase of the DGR.

The review team also acknowledged the mechanisms for verifying the alignment of the individual organizations' strategies with the national policy and for ensuring the alignment between the strategies as

a good practice. "SÚRAO, as a waste disposal implementor, highly appreciates all technical discussions and observations that underline the good basis for safe and responsible waste management. It is based on the high technical competence and the solid performance of all organizations and facilities ensuring the safety of radioactive waste disposal in the Czech Republic," said Lukáš Vondrovic, SÚRAO Director.

Source: <https://www.iaea.org/newscenter/pressreleases/iaea-mission-says-czech-republic-manages-radioactive-waste-and-spent-fuel-safely-encourages-preparations-for-nuclear-power-expansion-0>, 01 November 2023.

NETHERLANDS

Construction Under Way of New Dutch Radwaste Facility

The order to begin construction of the MOG was given and the first bored pile was driven into the ground on 22 September, Covra said. All 438 bored piles for the MOG have now all been installed. Covra applied to the Authority for Nuclear Safety and Radiation Protection (ANVS) in August 2022 for a permit change under the Nuclear Energy Act to construct the MOG facility. Among the documents submitted by Covra along with the permit application were an environmental impact assessment (EIA) and a supplement to its safety

report. ANVS granted the final permit to Covra in June this year. Covra subsequently applied for and obtained a building permit from the municipality of Borssele. Completion of the new storage building - plans for which were announced by Covra in March 2021 - is expected in 2025.

The new storage building is mainly intended for the storage of historical radioactive waste that is currently stored on the site of medical isotope producer NRG in Petten. Future decommissioning waste from nuclear installations in the Netherlands will also be placed in the MOG. The current processing and storage at Covra is not yet suitable for this, Covra said. The new building - designed for the storage of drums of radioactive waste in special stackable storage containers - will provide sufficient storage capacity until 2050.

The 2400-square-metre MOG will have a repacking area where drums with radioactive waste will be packed from the transport container into the storage container. These stackable storage containers will also be used for final storage. Covra said the building will also be made suitable for waste that it currently receives and which could possibly be processed and packaged in a different way in the future with a view to disposal. MOG - designed for a lifespan of at least 100 years - will be able to accommodate 4000 cubic metres of radioactive waste. The building has been designed in such a way that the storage capacity can easily be expanded later.

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A robot dog is helping to clear up nuclear waste at a nuclear site. Sellafield in West Cumbria say its pioneering use of robots is not only making their work safer and faster, but is also delivering insights that are beneficial for other UK nuclear sites. The dog, named Spot, is now frequently seen at the nuclear waste processing site, performing jobs that range from equipment checks to waste segregation.

Source: <https://www.world-nuclear-news.org/Articles/Construction-under-way-of-new-Dutch-radwaste-facil>, 31 October 2023.

UK

Sellafield Uses Robot Dog in Nuclear Waste Management

A robot dog is helping to clear up nuclear waste at a nuclear site. Sellafield in West Cumbria say its pioneering use of robots is not only making their work safer and faster, but is also delivering insights that are beneficial for other UK nuclear sites. The dog, named Spot, is now frequently seen at the nuclear waste processing site, performing jobs that

range from equipment checks to waste segregation.

Spot's abilities were demonstrated to industry colleagues during a live event at Calder Hall, one of the site's oldest buildings. Deon Bulman, Remote Operated Vehicles (ROV) equipment programme lead, said: "The adoption of new technology is progressing at pace at Sellafield as people start to see the benefits." The technology is here to support people, not replace

them, and those that embrace it soon see the advantages. "If we can do one task that removes the need for a person to enter a hazardous area, that's a win."

At the helm of this approach is the plant's remote operated vehicles (ROV) department, based at the Engineering Centre of Excellence in Cleator Moor.

Standard equipment and software is being customised to fit a range of site-specific needs. The department recently became the first worldwide to use a LiDAR laser scanning instrument on a ROV in a high-radiation environment, allowing robots to generate a three-dimensional image and eliminating the need for human entry by navigating hazardous areas.

ROV equipment engineer Calvin Smye said: "Everything we are using is off the shelf but by adding different payloads, like a LiDAR sensor and a radiation monitor, we are adapting them to deliver for our business." He explained how they've become industry leaders in applying this

technology and have seen other nuclear sites embrace this after their success. Another company, AtkinsRéalis, was able to use Spot for a livestreamed inspection using the robot's onboard camera, providing them with an accurate understanding of the area. Sellafield's ROVs are now being utilised at other nuclear sites around the UK, such as Dounreay in Scotland. In addition to enhancing safety, Sellafield say ROVs also offer significant cost savings while improving operational efficiency. ...

Source: <https://www.newsandstar.co.uk/news/23903655.sellafield-uses-robot-dog-nuclear-waste-management/>, 07 November 2023.



Centre for Air Power Studies

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

Centre for Air Power Studies

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