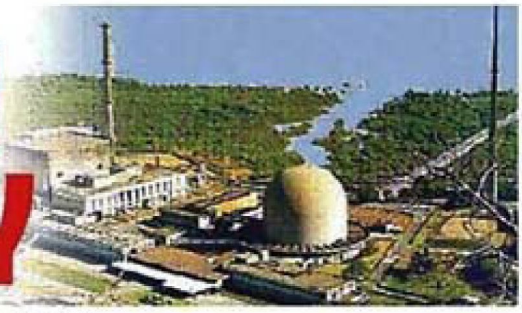
NUCLEAR SECURITY



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

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OPINION – Jarret Adams

The Communications Challenge for Nuclear Energy's Revival

The past few years have seen the nuclear energy sector go through an extraordinary transformation. From nuclear power plants shutting down prematurely in Europe and the USA, we are now seeing a wave of new plants entering service and next-generation designs such as SMRs on the cusp of breaking ground on construction. The tide has shifted dramatically in favour of nuclear energy, spurring a major shift in growth projections.

The industry has shifted from its historical defensive crouch to lean toward the future. This requires a shift in mindset as well as strategy as companies move from development to implementation, from ideas to shovels in the ground. The secret is that nuclear energy's comeback story is not just about new technology but about new business approaches and new ways to identify and engage customers, investors, communities, and others. It is about how we beef up how we communicate the industry's advances as part of business models positioning the industry for the future. A host of factors are shaping how we do this.

The secret is that nuclear energy's comeback story is not just about new technology but about new business approaches and new ways to identify and engage customers, investors, communities, and others. It is about how we beef up how we communicate the industry's advances as part of business models positioning the industry for the future.

The war in Ukraine has highlighted how nuclear energy supports energy security as supply disruptions caused global natural gas prices to spike. This has coloured the thinking of energy policymakers and seen them reconsider plans to shut down existing nuclear plants and prompted consideration of building new ones. Although policymakers previously touted nuclear as part of the long-term solution to reducing emissions, concerns about energy security have made resilience a more immediate concern.

While the answer is still nuclear energy, the route

to this answer has changed, and the topic is higher on the priority list for nations previously reliant on gas supplies originating in Russia. Consequently, growth projections for nuclear growth projections have been revised steadily upward, with most predicting a doubling or tripling of global capacity by 2050. IAEA just raised its growth scenario for 2050 for nuclear energy for the third year in a row because of growing clean energy demands along with concerns about energy security. "Climate change is a big driver, but so is security of energy supply," said IAEA Director General Grossi when the agency announced the new projections.

We have made great progress in recent years building support for nuclear energy. Support for nuclear energy in the USA has risen steadily and has remained at record levels for the past three years, with 76% in favour, according to an annual survey by Bisconti Research. Nuclear energy's advantages are drawing new countries to consider using the technology for the first time, as they look to reduce their reliance on fossil fuel imports and pursue their clean energy/net-zero emission goals. For many, smaller plants such as SMRs are better suited to their budgetary constraints and existing infrastructure, and now advanced nuclear designs are expanding the range of applications that plants can meet, such as desalination, industrial heat and charging electric vehicles, as well as simply replacing fossil-fired power plants to make electricity. Meanwhile, there is still interest in large nuclear plants in countries with strong electricity demand growth. Recent completions of large plants in Finland, UAE, USA and elsewhere have buoyed expectations of signing new supply agreements. But large or small, developers will need to ensure enduring policy landscape, secure investment, complete engineering work, construction plans, sign supplier agreements, gain regulatory approvals and engage with potential host communities for the plants. Achieving all these things requires effective communication and engagement activity, over significant timescales. That in turn requires an in-depth understanding of these stakeholders, their concerns, their influencers and their constraints.

Recent completions of large plants in Finland, UAE, USA and elsewhere have buoyed expectations of signing new supply agreements. But large or small, developers will need to ensure enduring policy landscape, secure investment, complete engineering work, construction plans, sign supplier agreements, gain regulatory approvals and engage with potential host communities for the plants. Achieving all these things requires effective communication and engagement activity, over significant timescales.

At Full On Communications, we have observed this evolution firsthand. Nuclear industry colleagues have begun to recognise that communication is no longer simply press releases and a website. Successful engagement requires integrated planning and implementation to make real connections, build trust and foster mutual understanding. Shifting from dogmatic insistence backed with data and diagrams, to a two-way dialogue, predicated on listening first and then responding empathetically, is key. Sometimes this may be face-to-face and sometimes virtually via webinars and channels such as social media. The role of trusted independent voices in these discussions is also critical - be they technical experts or trusted representatives within a stakeholder group.

Alongside technological developments, we have responded to this shift in the industry's thinking and reflected on how our work has broadened from traditional communications advice to a more multi-faceted art form. With this coordinated array of activities, we can better connect with stakeholders and explain how nuclear energy contributes to making people's lives better. And we have seen some important successes along the way. With the wind at its back, nuclear energy is poised to play a much larger role in solving our energy and climate challenges. That is why expanding our scope to communicate in a more holistic sense about the business of nuclear energy is critical to navigating the way forward.

Source: https://world-nuclear-news.org/Articles/Navigating-the-Communications-Challenge-of-Nuclear. 18 October 2023.

OPINION – Walter Pincus

The Dawn of Our Nuclear Wake-Up Call

A list of proposals released on 16 October in the final report of the 12-member bipartisan Congressional Commission on the Strategic Posture of the US, lays out a questionable buildup of the U.S. nuclear posture. "The following strategic nuclear force posture modifications should be pursued with urgency: Prepare to upload some or all of the nation's hedge [nuclear] warheads [now non-deployed]; Plan to deploy the [new] Sentinel ICBM in a MIRVed configuration; Increase the planned number of deployed [nuclear] Long-Range Standoff [cruise missiles]; Increase the planned number of [new] B-21 bombers and the tankers an expanded force would require; Increase the planned production of Columbia SSBNs [strategic submarines] and their Trident ballistic missile systems; Accelerate development and deployment of D5 LE2 [extended-life, sub-launched ballistic missile]; Pursue the feasibility of fielding some portion of the future ICBM force in a road mobile configuration."The recommendations were based on a threat assessment by the hand-picked team of Republican and Democratic members of Congress based on what the U.S. may be facing in just a few years — two nuclear peer adversaries, Russia and China. The Commission said it was responding to a worst-case situation, saying in its report, "nuclear force structure constructs can no longer assume that the nuclear forces necessary to deter or counter the Russian nuclear threat will be sufficient to deter or counter the Chinese nuclear threat simultaneously. Nuclear force sizing and composition must account for the possibility of combined aggression from Russia and China. Therefore, the US needs a nuclear posture capable of simultaneously deterring both." There was little public notice of the Congressional Commission's proposals given Hamas' terrorist attack on Israelis and Israel's continuing response, the fighting in Ukraine and the internal GOP battle over House Speaker. However, the report's recommendations will be taken seriously on Capitol Hill as reflected in this response from Rep. Mike Rogers (R-Ala.), Chairman of the House Armed Services Committee, who said, "The details of this report should serve as a wakeup call for our strategic posture – we need to rapidly make changes now if we want to deter tomorrow."

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I agree with the views expressed by writers for the Federation of American Scientists (FAS) who said, "The Commission's embrace of a U.S. nuclear buildup ignores the consequences of a likely arms race with Russia and China." The FAS group recognized that the proposed U.S. nuclear buildup response to China would cause Russia to increase its own deployed warheads and delivery systems and perhaps cause China to rethink it needs even more. But beyond the threat of causing a new arms race, the Congressional Commission's report resurrects a series of Cold War rationales for added nuclear weapons that I believe are no longer valid. For example, the Commission declares that the first "foundational strategy tenet is…maintaining an assured second-strike capability sufficient to impose unacceptable costs as an adversary or adversaries perceive it under any conditions." Here, the Commission raises the old Cold War 'first strike' threat that was a reason for building up U.S. nuclear forces back in the late 1950s-early 1960s. However, who today believes that either Russia or China – or both together – would ever attempt to carry out the so-called first strike, to knock out the entire U.S. nuclear force?

That is why beginning in the late 1960s, we established the diversified Triad – using strategic bombers, ICBMs and strategic SLBMs to survive

and thus deter any first strike. A first strike carried out against the deployed U.S. nuclear Triad that exists today would require the most precise attack in human history and the resultant radioactive fallout – 400 of U.S. ICBMs are in underground silos — would threaten the survival of much of mankind. Also, remember that today, a U.S. strategic Ohio-class submarine carries 20 SLBMs with three or four warheads on a missile, each warhead many times more powerful than the bomb used at Hiroshima. Normally, four of 15 U.S. strategic subs are on operational patrol, which means they are all but impossible to be targeted. That also means there could be a minimum of 240 U.S. nuclear warheads that, without the proposed Commission buildup, could today and in the future, survive any Russia/China hypothetical first strike attempt. In addition, employing the retaliation for a first strike theory puts the emphasis on survival of systems and therefore requires more weapons and delivery systems if a retaliatory strike is to be effective.

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Another fallacy in the Commission's deterrent rationale is that holding at risk key elements of Russian and Chinese leadership would "Continue the practice and policy of not directly targeting civilian populations and adhere to the LOAC [Law of Armed Conflict] in nuclear planning and operations." In Cold War days, and I believe today, saying you are targeting "key elements of their [Russia, China] leadership [and] the security structure maintaining the leadership in power," means hitting Moscow, Beijing and perhaps other cities, each with more than one thermonuclear warhead. That would result in the killing and wounding millions of civilians, so don't talk about adhering to LOAC when you are contemplating nuclear attacks on "key leadership" of Russia and/or China. As with Hiroshima and Nagasaki, although they each had minor military targets, the real aim of using the first atomic bombs was to use them as terror weapons to kill people and end a war, not to continue fighting that war.

There is an interesting, relevant story behind the 1960s end of the Eisenhower Administration's strategy to deter first use of nuclear weapons by the Soviet Union. It was called "massive retaliation" and claimed that the U.S. would use almost all its nuclear weapons as a response to destroy the Soviet leadership and its urban/industrial base. It was also called city busting. Robert McNamara, who served as Defense Secretary during the Kennedy Administration, rejected the Eisenhower Administration's strategy of attacking cities and instead wanted to destroy Soviet nuclear weaponry, which required many more nuclear weapons and more accurate delivery systems. As described in the 2010 book *Stockpile* by retired Vice Adm. Jerry Miller, who in the early 1960s worked at Strategic Command on joint strategic target planning, "when he [McNamara] took office in 1961, the weapons in the nation's nuclear war plan numbered around 3,500. When he left office seven years later, the figure was about 7,000 and climbing to 10,000." Before President H.W. Bush's administration ordered reductions and arms

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The Commission also recommended an increase in lower-yield tactical or battlefield weapons in order to – as its report says – "Provide the President a range of militarily effective nuclear response options to deter or counter Chinese or Russian limited nuclear use in theater." It specifically calls for "additional U.S. theater nuclear capabilities" in Europe and the Indo-Pacific areas. Today, Russia has some 2,000 tactical nuclear weapons while the U.S. maintains less than half that number in tactical nuclear bombs and air-launched and sub-launched missiles. The Commission said, "Russia is projected to continue to expand and enhance its nuclear forces, with most of the growth concentrated in theater nuclear forces, thus increasing its decided numerical advantage over U.S. and allied nuclear forces."

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In addition, the Commission claimed, "Russian strategy and doctrine as written, envisions limited first use of theater nuclear weapons to, inter alia, coerce war termination on terms acceptable to Russia," which is also referred to as the "escalate to de-escalate policy." Russian officials, however, continue to insist that Moscow would only order first use of any nuclear weapon if existence of the state were under threat. However, the Commission recommends a policy that sounds very much like Russia's so-called 'escalate to de-escalate' policy. The Commission said, "The objectives of U.S. strategy must include effective deterrence and defeat of simultaneous Russian and Chinese aggression in Europe and Asia using conventional forces. If the US and its Allies and partners do not field sufficient conventional forces to achieve this objective, U.S. strategy would need to be altered to increase reliance on nuclear weapons to deter or counter opportunistic or collaborative aggression in the other theater."

That's a great example of the declaratory policy of "calculated ambiguity," which the Commission approves. As its predecessor Congressional Commission on the Strategic Posture of the US put it back 2009, "Calculated ambiguity creates uncertainty in the mind of a potential aggressor about just how the U.S. might respond to an act of aggression, and this ought to reinforce restraint and caution on the part of that potential aggressor." As I've indicated, when it comes to nuclear weapons, people have played word games with nuclear strategy and have felt strong or weak politically at home and diplomatically abroad, based on the number of nuclear weapons possessed. The most important fact about nuclear weapons remains — they have not been used in wartime since 1945, and despite their now-growing focus, hopefully, they will not ever be used again.

Source: https://www.thecipherbrief.com/column_article/the-dawn-of-our-nuclear-wake-up-call. 17 October 2023.

OPINION – Michael Eisenstadt

America's Failing Iran Nuclear Policy: Time for a Course Adjustment

America's inability to rein in Tehran's nuclear program after exiting the 2015 nuclear deal — to halt the Islamic Republic's subsequent accumulation of fissile material and to forge a "longer and stronger" deal — should prompt Washington to reassess its Iran policy. Such a reckoning should acknowledge that the US has never used all of the implements in its policy toolkit to rein in Iran's nuclear ambitions, while the tools it has generally relied on — diplomacy, sanctions, and (to a much lesser extent) the threat

of force — are less effective today due to a shifting geopolitical landscape.

For now, it is unclear if ongoing stop-gap diplomacy to reach informal understandings with the Iranian leadership absent a formal deal will cause the Islamic Republic to curb its fissile material buildup indefinitely in return for the easing of sanctions on its oil exports. Furthermore, the Israeli-Hamas war in Gaza will almost certainly absorb the attention of U.S. policymakers for months to come. Yet policymakers will need to remain focused on halting Iran's fissile material buildup while undertaking a long-term effort — using a broader policy toolkit than employed to date — to shape Tehran's assessment of the risks, costs, and utility of nuclear weapons. The goal should be to dissuade and deter Iran from building a bomb, and thus to keep it kicking the (nuclear) can down the road. Because there are no insurmountable technical obstacles to Iran building nuclear weapons, shaping its proliferation calculus is key to influencing the trajectory of its nuclear program. A "shaping strategy" to avoid a nuclear-armed Iran, moreover, should be something to which nearly all parties to the often-fraught Iran policy debate can agree — whether "engagers," "containers," or "regime changers."

Because there are no insurmountable technical obstacles to Iran building nuclear weapons, shaping its proliferation calculus is key to influencing the trajectory of its nuclear program. A "shaping strategy" to avoid a nuclear-armed Iran, moreover, should be something to which nearly all parties to the often-fraught Iran policy debate can agree — whether "engagers," "containers," or "regime changers.

Outdated U.S. Policy Assumptions: Many of the assumptions underpinning U.S., European, and Israeli policy approaches toward Iran's nuclear program are no longer valid. The U.S. (and to some extent European) approach was best summed up by Secretary of State Blinken when he stated that "diplomacy is the best way to verifiably, effectively, and sustainably prevent Iran from getting a nuclear weapon," though if "Iran rejects [this] path … all options are on the table." Yet Iran has repeatedly rejected opportunities to negotiate a longer, stronger deal, and should push comes to shove, it is not clear that "all options" really are "on the table" — that a U.S. president would order a military strike on Iran's nuclear weapons program.

By contrast, Israeli PM Netanyahu has claimed that "the only thing that has … stopped rogue nations [like Iran] from developing nuclear weapons is a credible military threat or … military action. … The longer you wait [however], the harder that becomes." Yet Israeli credibility has been undermined by its failure to enforce its own nuclear redlines or to prepare adequately for the consequences of the U.S. exit from the 2015 nuclear accord after it encouraged Washington to abandon the deal. Moreover, relying on Israel to do the job is not the answer, as Iran is too big a problem for Israel to handle on its own.

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Approaches that lean heavily on a single factor for success, whether diplomacy (the US and Europe) or the threat of force (Israel), are likely to yield fragile policies built upon a single point of failure. By contrast, a more holistic approach that employs all the instruments of national power (sanctions, diplomacy, covert action, the threat of force, and influence activities) is more likely to yield a robust, sustainable policy of dissuasion, deterrence, and delay. And such an approach is more likely to succeed at shaping Tehran's perception of the potential risks, costs, and utility of nuclear weapons — and to dissuade it from building a bomb. At any rate, U.S. policymakers do not seem to recognize that many of the policy tools that the US and its allies traditionally relied on to constrain Iran's nuclear ambitions are no longer as useful as they were in the past:

Sanctions: Washington's ability to sanction Tehran's oil sector has frequently been constrained by a desire to avoid price shocks and limit tensions with China — currently its main customer. And Iran's

efforts to build a more diversified, self-reliant "resistance economy" will increasingly limit the efficacy of sanctions; today, oil and gas sales as a proportion of total exports and government revenues are a fraction of what they were a decade ago. And if the US were to undertake a revived "maximum pressure" campaign, the Islamic Republic could respond as in 2019 with attacks on oil transport and infrastructure in the Gulf. Preoccupied with the war in Ukraine and tensions with China, any administration will try to avoid new entanglements in the Middle East. So, while sanctions remain useful — restricting Tehran's access to foreign exchange and limiting its military spending — economic and military considerations increasingly constrain their application.

Tehran aspires to a regional and global leadership role but cannot achieve this goal if it is diplomatically isolated. So, to avoid diplomatic censure, it has regularly promised greater access and transparency to UN nuclear inspectors to avoid a referral of its case to the UNSC. Similarly, to gain relief from crushing sanctions and ease its international isolation, it agreed to roll back large parts of its nuclear program in a 2013 interim deal that led to the 2015 JCPOA with the P5+1.

Diplomatic Isolation: Tehran aspires to a regional and global leadership role but cannot achieve this goal if it is diplomatically isolated. So, to avoid diplomatic censure, it has regularly promised greater access and transparency to UN nuclear inspectors to avoid a referral of its case to the UNSC. Similarly, to gain relief from crushing sanctions and ease its international isolation, it agreed to roll back large parts of its nuclear program in a 2013 interim deal that led to the 2015 JCPOA with the P5+1 (the US, UK, France, Russia, China, and Germany). Since then, Tehran's ties with Europe have frayed due to its role in a string of terrorist plots in Europe, its violent repression of the "women, life, freedom" protests, and its military support for Russia's war on Ukraine. However, the emergence of a multipolar global order and the Iranian government's recent efforts to forge close partnerships with Russia and China have created new opportunities for the Islamic Republic. After all, its allies in its efforts to counter U.S. "hegemony" (Russia, China, and other members of Brazil, Russia, India, China, and South Africa group and the Shanghai Cooperation Organization) comprise almost half of the world's population. So, while Tehran still lacks a reliable great power partner, it may no longer feel that it can be isolated.

Covert Action and Sabotage: Covert action can buy time by disrupting and delaying the activities of nuclear aspirants, but it cannot halt a determined proliferator. Israeli efforts to sabotage Iraq's nuclear program did not eliminate the need to eventually bomb the Osirak reactor in 1981. Likewise, though Iran's march toward a nuclear weapons capability has been delayed by acts of sabotage, it continues to make progress. And recent Israeli covert actions may have spurred Tehran to accelerate its efforts. So, while covert action remains a vital tool, it is not a game changer and may be counterproductive, absent a willingness to employ military force to deter countermoves.

Yet military action may not always be possible if nuclear diplomacy fails: hardening, burying, and dispersal may eventually put the Islamic Republic's nuclear program beyond the reach of conventional weapons; crises elsewhere (e.g., the Israeli-Hamas war in Gaza) may preclude effective Israeli or U.S. military action; Iran's growing missile and drone force may make preventive action prohibitively costly; and intelligence sources could dry up (though Iran's nuclear program seems thoroughly penetrated).

Preventive Military Action: The US has implied, and Israel has practically expressed, a readiness to use force to prevent Iran from developing a nuclear weapon. Yet military action may not always be possible if nuclear diplomacy fails: hardening, burying, and dispersal may eventually put the Islamic Republic's nuclear program beyond the reach of conventional weapons; crises elsewhere (e.g., the Israeli-Hamas war in Gaza) may preclude

effective Israeli or U.S. military action; Iran's growing missile and drone force may make preventive action prohibitively costly; and intelligence sources could dry up (though Iran's nuclear program seems thoroughly penetrated).

Even if a military strike remains a viable option, it is likely to yield only modest benefits. Bombing nuclear reactors (as Israel did in Iraq in 1981 and Syria in 2007) may buy up to a decade of delay; bombing a dispersed and hardened centrifuge program that can be quickly reconstituted would probably buy much less time. Iran will almost certainly rebuild — perhaps in secret and possibly after expelling UN inspectors — and it might abandon its hedging strategy after a strike and go for a nuclear bomb. For this reason, follow-on strikes might be necessary months or years down the road — and again after that.

For Israel, a preventive strike would need to maximize damage to Iran's nuclear infrastructure without catalyzing a broader, more destructive conflict that might preclude future attacks. And while "mowing the grass" might have worked for a time in Gaza, it is probably not a viable approach for managing Iran's nuclear program.

Both Israel and Iran, then, face unpalatable options. For Israel, a preventive strike would need to maximize damage to Iran's nuclear infrastructure without catalyzing a broader, more destructive conflict that might preclude future attacks. And while "mowing the grass" might have worked for a time in Gaza, it is probably not a viable approach for managing Iran's nuclear program. Iran, for its part, would try to hit back hard enough to deter follow-on strikes, but not so hard as to spark a broader conflict that could draw in the US and possibly leave its oil and gas infrastructure in shambles.

And domestic uncertainty in Israel (due to the war in Gaza) and Iran (due to planning for the post–Ali Khamenei succession) argue against risky moves by either at this time — though it is unclear how the Gaza war will affect Iran's calculus. Israeli policymakers would probably prefer to defer a decision about a preventive strike, while Supreme Leader Khamenei will probably defer a decision about building a bomb as long as he believes it could prompt such a strike; the risks and costs of both are potentially high and the benefits uncertain. The symmetry in the dilemmas faced by the two sides is striking. Tehran's dilemma, however, when seen in the context of its nuclear hedging strategy, may represent an opportunity for America and its allies.

Iran's Nuclear Hedging Strategy and Proliferation Calculus: Locked in a grinding conflict with Iraq, Iran initiated its nuclear weapons program in the mid-1980s, acquiring technology and know-how. By the late 1990s, it launched a secret crash effort to obtain nuclear weapons. However, its secret fissile material production program became public in 2002, and after the US invaded Iraq in 2003, the Islamic Republic halted nearly all weapons-related work, fearing an American attack if these activities were discovered.

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Iran's leadership had apparently concluded that the potential risks and costs of building a bomb were greater than previously anticipated. Tehran thus adopted a nuclear hedging strategy that has enabled it to create a nuclear weapons option while managing the risks of doing so. The resulting cautious, go-slow approach has on several occasions led Iran to temporarily halt or roll back elements of its program in order to achieve other vital objectives: avoiding diplomatic censure, obtaining sanctions relief, and gaining recognition of its "right to enrich." This approach has also enabled Iran to become a nuclear threshold state, which may confer many of the benefits of having a bomb without the risks that trying to get one would entail.

And the risks would be substantial. Given its program's penetration by foreign intelligence services, Iran has to assume it will get caught if it tries to build a bomb, perhaps prompting an Israeli or U.S. military strike. So it will probably accumulate

a large stockpile of fissile material before attempting a breakout, to ensure that significant quantities survive a possible strike. This will help jump-start efforts to rebuild and allow Iran to make more than the handful of devices initially envisaged by its 1990s-era crash program. And then there are the technical challenges of bomb-making — not all of which Iranian scientists have mastered. A large, simple device for delivery by ship or aircraft might take six months to build; a more compact device for delivery by missiles might take 18 to 24 months. This would create a window of vulnerability that Iran would need to cross before it got its first bomb.

For this reason, rather than dashing to a nuclear "breakout," Tehran might attempt to "creep out": moving slowly and deliberately, while conducting low-signature weapons development activities at small clandestine sites in the hope that they would not be detected — or at least would not provoke a military response if discovered. These dilemmas, rooted in the very logic of its hedging strategy, create opportunities to shape the Iranian regime's proliferation calculus by playing on its concerns that an attempt to acquire nuclear weapons could prompt a military strike, while they would contribute little to regime protection or power projection. In this way, Washington and its partners may induce Iran to further postpone a decision to weaponize — buying time to develop additional sources of leverage to persuade the Islamic Republic to keep kicking the (nuclear) can down the road.

Given Tehran's apparent uncertainty about how to proceed with its nuclear program, such influence activities might tip the psychological balance in the minds of key Iranian decisionmakers in favour of proliferation restraint and convince the regime that deferring a decision on nuclear weapons continues to be in its interest.

Fostering Concerns about the Risks, Costs, and Utility of the Bomb: The US and its European partners have traditionally relied on a few "big sticks" in their nuclear diplomacy with Tehran — particularly the threat of diplomatic censure and economic sanctions — and they should continue wielding these sticks as best they can. But these should be augmented with several "smaller sticks" — information- and cyber-driven influence activities — as well as another big stick that Washington has often been reluctant to employ — military signalling — in order to shape Iran's proliferation calculus.

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Nuclear Weapons — a Two-Edged Sword: Iranian decisionmakers need to consider whether a country that has failed to protect its most senior nuclear scientists from foreign hit teams, its most sensitive nuclear facilities from sabotage, and its nuclear archives from theft, should build nuclear weapons. After all, they could be stolen by disaffected military personnel or individuals working for foreign intelligence services and used to threaten the regime. Or they might be used without authorization by hardline zealots against Israel or U.S. targets in the region, provoking a catastrophic nuclear response. Growing disaffection in Iran will only magnify these risks in the coming years. Furthermore, Iranian decisionmakers should consider whether in a crisis or war, cyber-attacks or sabotage could cause nuclear missiles to be misdirected as a result of

Iranian decisionmakers should consider whether in a crisis or war, cyber-attacks or sabotage could cause nuclear missiles to be misdirected as a result of cyber manipulation, global positioning system spoofing, or the intentional entry of incorrect target data so that they hit targets in Iran. To this end, the US and its partners should quietly demonstrate, from time to time, their ability to penetrate sensitive Iranian military command and control networks with cyber tools.

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Crisis Instability: The deployment of nuclear-tipped missiles would create new capabilities as well as new dilemmas for the Islamic Republic. Short missile flight times (seven to eight minutes) from Iran to Israel might cause the latter to adopt a launch-on-warning nuclear posture and pre-delegate use authority to military commanders. This could increase the risks of miscalculation during a crisis or war. Thus, in the event of an attack, Israel might not be able to discern whether incoming Iranian missiles were conventional or nuclear. It would then have to choose between riding out what could be a devastating nuclear first strike or launching a nuclear "counterstrike" in response to what might turn out to be a conventional attack. Paradoxically, nuclear-armed missiles might undermine the utility of Iran's large conventional missile force.

Its hedging strategy may therefore be driven, at least in part, by a desire to achieve nuclear threshold status without causing a cascade. If so, the Iranian leadership is not succeeding. Several regional states have already established civilian nuclear energy programs — at least in part as a hedge against Iran's nuclear program. And a proliferation cascade could eventually make Iran's hedging strategy untenable, causing it to build a bomb to stay ahead of its neighbors.

Iran's Nuclear Vulnerabilities: Public discussions in Iran have rarely addressed the potentially devastating consequences of a nuclear strike, although former President Rafsanjani once mused about Israel's vulnerability to a single nuclear weapon due to its small size. Yet with 75 percent of its population living in cities and with greater Tehran the home to 50 percent of its industry, 30 percent of all government workers, and more than 50 higher education institutions, Iran is also extremely vulnerable to a nuclear strike.

Consequently, it would benefit greatly from the kind of discussion about nuclear weapons that occurred in the US and elsewhere in the 1960s and 1970s, thanks to the efforts of antinuclear activists and movies such as On the Beach (1959), Fail-Safe (1964), and The Day After (1983), which educated citizens and policymakers about the horrors of nuclear war. These films and others like them should be dubbed in Persian and made available to Iranian audiences, while maps of various Iranian cities that illustrate the effects of a nuclear blast should be made available to Iranians through social media. This will enable Iranian citizens and policymakers to experience the gut-wrenching feeling that many Americans in the 1960s and 1970s experienced when viewing such maps and assessing the odds of surviving a nuclear strike.

A Proliferation Cascade: Senior Iranian officials have only occasionally evinced concern that the country's nuclear program might set off a regional proliferation cascade that could jeopardize the country's security. Why? They might believe that their neighbors are incapable of building nuclear weapons or would not pose a threat were they to do so, or that a proliferation cascade would constrain the US and Israel more than it would Iran. Alternatively, Tehran may harbor such concerns but may consider it unseemly to voice them. Its hedging strategy may therefore be driven, at least in part, by a desire to achieve nuclear threshold status without causing a cascade. If so, the Iranian leadership is not succeeding. Several regional states have already established civilian nuclear energy programs — at least in part as a hedge against Iran's nuclear program. And a proliferation cascade could eventually make Iran's hedging strategy untenable, causing it to build a bomb to stay ahead of its neighbors. This might spark a nuclear arms race that could one day pose an existential threat to Iran — yet another reason for nuclear restraint by Iran.

The Utility of Nuclear Weapons: Supreme Leader Khamenei has sometimes questioned the military utility of nuclear weapons, perhaps to provide an after-the-fact justification (in addition to his so-called "nuclear fatwa") for his 2003 decision to halt Iran's crash program. According to Khamenei, nuclear weapons did not ensure the survival of

the Soviet Union, help the US in Vietnam, or enable the Islamic Republic's enemies to foil its regional designs. Likewise, Khamenei seems to believe that Israel's nuclear arms will not prevent Iran and its proxies from destroying the Jewish state. Tehran's growing conventional missile and drone arsenal might also lead it to conclude that nuclear weapons are unnecessary — at least for now — causing it to double down on its hedging strategy, while it inches ever closer (in asymptotic fashion) to a nuclear weapons capability.

While the Iranian leadership has never doubted U.S. military capability, it has come to doubt U.S. commitment and resolve. Accordingly, Tehran's fears of U.S. military action have faded. This, however, may be changing. Since early 2023, the U.S. military has held a series of joint exercises with Israel and reinforced its presence in the Gulf with fighter aircraft, bombers, and warships.

Finally, there is no evidence that the Islamic Republic sees nuclear weapons as essential to regime survival. If that were so, it would not have agreed — just a few years after the 2009 Green Movement protests revealed the extent of popular disaffection with the regime — to an interim nuclear deal in 2013 and a longer deal in 2015 that would have capped most of its nuclear activities for over a decade. The uncritical embrace of such a flawed assumption may lead to missed opportunities to influence Iran's proliferation calculus, and to failed policies.

Iran's leadership has seen that while nearly every U.S. president since World War II has tried to avoid or to extricate U.S. troops from military entanglements in the Middle East, nearly every single one has been drawn into conflicts there. They therefore should wonder whether President Biden might be the next to do so if they are not careful.

The Threat of Force and U.S. Unpredictability: Fears of U.S. military action in 2003 and foreign intelligence penetrations of its nuclear program caused Tehran to eventually adopt a nuclear hedging strategy; threats of Israeli military action between 2010 and 2012 encouraged Iran to continue down this path. Yet in recent years, U.S. leaders have generally been reluctant to take steps that could lend credibility to their pledges that Iran will never get the bomb, satisfying themselves with performative gestures that entail little risk — such as the dispatch of carrier strike groups to the Gulf and B-52 presence patrols there. (Now focused on the Indo-Pacific region, the U.S. Navy has not had a carrier in the Gulf region since 2021.) While the Iranian leadership has never doubted U.S. military capability, it has come to doubt U.S. commitment and resolve. Accordingly, Tehran's fears of U.S. military action have faded. This, however, may be changing. Since early 2023, the U.S. military has held a series of joint exercises with Israel and reinforced its presence in the Gulf with fighter aircraft, bombers, and warships. Some of these actions were likely taken to deter adversaries and assure friends, in the wake of attempts by Tehran to seize foreign tankers in the Gulf and Russian efforts to disrupt U.S. drone operations over Syria. Other steps were likely intended to indicate that a U.S. military option against Iran's nuclear program is still "on the table."

In the meanwhile, the US responded in March to the killing of an American contractor in Syria by killing eight pro-Iranian militiamen in a strike on an Islamic Revolutionary Guard Corps facility there. In July, a U.S. Navy destroyer prevented Iranian naval vessels from seizing two foreign oil tankers in the Gulf. In August, U.S. media reported that the US was considering the deployment of armed guards on tankers in the Gulf to prevent their diversion by Iran. And in response to the Gaza war, Washington sent two carrier strike groups to the eastern Mediterranean. These demonstrations of resolve — signaling the need for Tehran to tread carefully — may help deter future attacks and convince the Islamic Republic that Washington might act if it attempted a nuclear breakout.

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careful. Indeed, President Biden's impassioned speech following a brutal terrorist attack by the Gaza-based Palestinian Hamas organization that killed more 1,300 Israelis and resulted in the abduction of 200 more may mark the beginning of just such a policy turnabout. Under such circumstances, Tehran may worry that an Israeli military strike on Iran could drag in the US.

Russia has also weaponized nuclear power by occupying and refusing to operate the Zaporizhzhia Nuclear Power Plant in Ukraine and is jeopardizing global security by threatening to use tactical nuclear weapons, in spite of its status as a permanent member of the UNSC and founding member of the NPT.

Keep the Hedger Hedging: Whether Tehran continues hedging or attempts to build a bomb will be influenced greatly by how America and its allies shape Iran's assessment of whether it would get caught attempting a breakout; the odds of an Israeli or U.S. military response to such a step; and the risks, costs, and utility of nuclear weapons. Yet because Supreme Leader Ali Khamenei seems uncertain about how to proceed with Iran's nuclear program, relatively small policy adjustments may yield large policy payoffs. This only underscores the need for America and its allies to use all means available to shape the Islamic Republic's proliferation calculus in accordance with a policy of dissuasion, deterrence, and delay, in order to "keep the hedger hedging" — and to keep it kicking the (nuclear) can down the road.

For Russia, nuclear power represents another geopolitical weapon, similar to oil and gas. Its state nuclear company, Rosatom, works analogously to Gazprom in leveraging energy trade for political ends. Rosatom has provided loans for strategic nuclear power projects abroad, including Astravyets in Belarus, Akkuyu in Turkey, El Dabaa in Egypt, and Rooppur in Bangladesh.

Source: https://warontherocks.com/2023/10/americas-failing-iran-nuclear-policy-time-for-a-course-adjustment/. 20 October 2023.

OPINION – Julia Nesheiwat, Shoichi Itoh

Atoms for Peace 2.0: The Case for a Stronger US-Japan Nuclear Power Alliance

Since US President Eisenhower's "Atoms for Peace" speech at the UNGA in 1953, the nuclear energy landscape has changed dramatically. Eisenhower envisaged atomic energy as a way to build bridges between nations. Yet today, as an increasing number of countries in the Global South show interest in the carbon-free technology and view its adoption as a sign of geopolitical strength, Russia has capitalized on this opportunity to entrench itself in worldwide nuclear markets, while China waits in the wings to do the same. The world currently has sixty nuclear reactors under construction, of which more than one-third are Russian-designed. Combined with projects under planning or negotiation, Russia currently enjoys more than 40 percent of the global nuclear reactor export market in various forms, including power plant construction, investments, provision of enriched uranium, and disposal of spent fuel. Russia has also weaponized nuclear power by occupying and refusing to operate the Zaporizhzhia Nuclear Power Plant in Ukraine and is jeopardizing global security by threatening to use tactical nuclear weapons, in spite of its status as a permanent member of the UNSC and founding member of the NPT.

Russia's actions compel a thorough review of the geopolitics of nuclear energy. The US must play a forceful role in ensuring that nuclear technologies contribute to the global order rather than be weaponized against it. In that endeavor, Japan can be an invaluable ally. Facing new challenges for peaceful use of atomic energy against the backdrop of Russian and Chinese-induced geopolitical instability, Tokyo and Washington should redouble their commitment to competing in the international nuclear energy market.

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analogously to Gazprom in leveraging energy trade for political ends. Rosatom has provided loans for strategic nuclear power projects abroad, including Astravyets in Belarus, Akkuyu in Turkey, El Dabaa in Egypt, and Rooppur in Bangladesh. China has also identified the nuclear industry as a strategic sector and is gathering market share with its relatively cheap nuclear reactors, including the introduction of its Hualong One reactor in Pakistan and Argentina. Saudi Arabia is also reportedly interested in the Chinese reactor design.

A nuclear reactor race has begun between democracies and authoritarian states, and the latter are currently ahead. Nuclear projects are capital-intensive with lengthy time horizons, and authoritarian powers' intention to distribute nuclear reactors in developing countries is motivated by more than commerce. Russian and Chinese state-backed nuclear entities accrue geopolitical influence beyond mere commercial interests.

A nuclear reactor race has begun between democracies and authoritarian states, and the latter are currently ahead. Nuclear projects are capital-intensive with lengthy time horizons, and authoritarian powers' intention to distribute nuclear reactors in developing countries is motivated by more than commerce. Russian and Chinese state-backed nuclear entities accrue geopolitical influence beyond mere commercial interests. The risk is that a short-sighted approach may inexorably lead to a diminished role for democracies in the growing international nuclear industry.

By contrast, nuclear vendors from democratic states, including the US and Japan, have engaged the civilian nuclear market with business principles as opposed to geopolitical influence. That approach risks pushing the NPT regime toward collapse if the nuclear industry of the democratic world forfeits market share to authoritarian rivals. With its hostage-taking of the Zaporizhzhia plant, Russia has eschewed strict compliance with the NPT principle of peaceful atomic energy use. Given such recklessness, it cannot be ruled out that Moscow is helping non-democratic states develop reactors in contravention of internationally accepted rules regarding management of nuclear fuels, related technologies, and fissile materials. Meanwhile, amid tensions with the West, China is leaning on Russia's increasing provision of highly enriched uranium to scale up its military and civilian nuclear aspirations.

The US and Japan should counter these actions in support of a norms-based nuclear energy trade. The US is the world's single-largest operator of nuclear reactors with a fleet of ninety-three in operation. Japan—with whom the US has consolidated one of the strongest bilateral civilian nuclear partnerships—has the fifth-largest fleet in the world with thirty-three reactors. Such experience and expertise in operating atomic energy assets should be put to use internationally as the global nuclear energy market expands in response to energy security and climate challenges. Over the past six decades, Japan has become a key US partner with regard to the development of nuclear technologies and facilities. A nuclear partnership between the US and Japan that promotes research and development and accelerates commercialization of next-generation nuclear reactor innovations—including SMRs—could address energy insecurity globally and spread best practices in nuclear safety.

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The US-Japan strategic collaboration on supporting deployment of SMRs in Ghana, announced in October 2022, is an example of such a partnership.

Following this example, the two allies should pursue commitments to the other countries in agreement with the IAEA's standards of nuclear safety, security and nonproliferation for the sake of sustaining the NPT regime. Re-establishing a visionary nuclear energy strategy should be an economic and geopolitical priority for the democratic world. The US-Japan alliance should assume the leadership in peaceful atomic energy collaboration, along with the IAEA, lest deeper Russian and Chinese penetration of the global nuclear market erode NPT safeguards.

Source: https://www.atlanticcouncil.org/blogs/energysource/atoms-for-peace-2-0-the-case-for-a-stronger-us-japan-nuclear-power-alliance/. 23 October 2023.

OPINION – Jonathan Fenton-Harvey

What's Behind Saudi Arabia's Quest for a Nuclear Programme?

Saudi Arabia's heightened interest in nuclear capabilities has become a focal point of recent regional debates, a sentiment that intensified following a rare interview with Saudi Crown Prince Mohammad bin Salman (MbS) in September 2023. "If they get one, we have to get one,"…hinting at concerns over Iran's potential ambitions to acquire a nuclear bomb.

However, he was quick to emphasise a desire for regional stability and security, stating, "but we don't want to see that". Saudi Arabia has shown interest in being part of the US-backed Abraham Accords, joining several Arab countries including fellow Gulf states the UAE and Bahrain in normalising relations with Israel. The Kingdom has made it clear that this would come with strings attached, chief among them being the transfer of nuclear technology and advanced weaponry from the US. But Hamas' surprise attack on 7th October and the ensuing Israeli war on Gaza have thrown a curveball at Riyadh's plans. Analysts have speculated that one of Hamas's motives was to disrupt normalisation talks between Israel and Saudi Arabia.

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"Saudi Arabia is currently thinking long-term regarding its economic diversification and increasing its political clout in the region, and a nuclear programme is still part of this" In the past 12 days since the Hamas attacks, Israel has bombarded the besieged Gaza Strip, killing at least 3,700 Palestinians. Amid mounting concerns over immense civilian harm, Saudi Arabia has paused normalisation talks. Even before the latest violence, Riyadh's move towards normalisation with Israel was cautious, seeking to avoid criticism that it was neglecting a resolution to the Palestinian issue. One of its conditions was Palestinian statehood. This doesn't mean normalisation is off the table.

Indeed, Saudi Arabia is currently thinking long-term regarding its economic diversification and increasing its political clout in the region, and a nuclear programme is still part of this. For now, Riyadh prefers to tread carefully amid the uncertainty of war and promote a humanitarian and diplomatic solution. Given the risks of a wider regional conflict following Israel's assault on Gaza, particularly with Iran-backed factions, MbS called Iranian President Raisi on 12 October to discuss regional stability and unity amid the Gaza crisis. This indicates that amid fears of an escalation with Iran, particularly as the US pre-emptively accused Iran of backing Hamas' attack, Riyadh is trying to balance relations with Tehran and ensure that newly re-established bilateral ties remain smooth…

While nuclear energy is cited as a renewable and efficient source of energy, Riyadh has continued its reliance on hydrocarbons while developing new renewable sources of energy such as wind and solar. Therefore, economic considerations are apparently not the primary motive.

While nuclear energy is cited as a renewable and efficient source of energy, Riyadh has continued

its reliance on hydrocarbons while developing new renewable sources of energy such as wind and solar. Therefore, economic considerations are apparently not the primary motive. "Considering global concerns about climate change, it's surprising to place Saudi Arabia at the forefront [of a shift towards nuclear energy]," Henry Sokolski, head of the Nonproliferation Policy Education Centre and former deputy for non-proliferation policy in the US Defense Department, told The New Arab. "With its abundant solar resources, and reserves of natural and frackable gas, there are other avenues to explore for energy production. For Saudi Arabia, therefore, the real game seems to be more geopolitical, not economic or environmental," he added. Although Saudi Arabia has made strides in its nuclear program, its capabilities remain in their infancy.

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At present, their nuclear infrastructure is limited to a single research reactor at the King Abdulaziz City for Science and Technology. However, it has long stated ambitions to improve its nuclear capabilities. In May 2022, Saudi Arabia sought technical proposals for the building of two nuclear reactors, and in January 2023, Riyadh confirmed the nation's plan to utilise its local uranium reserves to create LEU as nuclear fuel. Riyadh has also made minor nuclear uranium discoveries. "Saudi Arabia has so far comparatively little experience in the nuclear field. It will have to rely on foreign partners to set up nuclear technology capacities and infrastructure," said Hibbs. "Riyadh is now looking for a path to future uranium enrichment as a condition for nuclear cooperation with the US," he explained. ...

China has already helped Saudi Arabia in building a ballistic missile initiative, which could serve as a delivery system for prospective nuclear warheads in the future. In the energy sector, China has already become a major investor in the Kingdom's solar energy, due to its dominance in supply chains. But since China brokered the rapprochement between Saudi Arabia and Iran in March, Washington has doubled down on relations with its Gulf state partners, reminding them of the benefits of US security support.

Evaluating Potential Partners: Riyadh has expressed a desire to explore nuclear relations with Washington and considers it a top partner, particularly owing to the US's strong reputation for nuclear engineering and technical expertise. There are others that are bidding, and obviously, we would like to build our programme with the best technology in the world, and that will require a certain agreement to be in place," Prince Faisal bin Farhan said during a joint press conference with Secretary of State Antony Blinken in June 2023. The US, although a preferred partner, is one of many bidders. The China National Nuclear Corporation made a proposal in August to construct nuclear power facilities in Saudi Arabia, which Riyadh reportedly considered. This can be interpreted as Riyadh sending a message to Washington that it can acquire nuclear technology elsewhere if needed.

Indeed, China has already helped Saudi Arabia in building a ballistic missile initiative, which could serve as a delivery system for prospective nuclear warheads in the future. In the energy sector, China has already become a major investor in the Kingdom's solar energy, due to its dominance in supply chains. But since China brokered the rapprochement between Saudi Arabia and Iran in March, Washington has doubled down on relations with its Gulf state partners, reminding them of the benefits of US security support. The combination of US capabilities and its security umbrella might be more attractive to Riyadh. "MbS can acquire nuclear technology from other countries, such as France, South Korea, China, or Russia. Yet if he does that, he risks alienating Washington and potentially compromising congressional backing for further advanced military sales," said Sokolski.

Transparency and Proliferation: Even if Washington is poised to be Riyadh's most suitable nuclear partner, any journey to nuclear capability is not without challenges and concerns. Observers are particularly worried

about nuclear proliferation in the region and transparency concerns. "Saudi Arabia has deep pockets and a growing engineering project management track record, and it should be able to succeed in setting up and operating nuclear power plants," said Hibbs. "There are outstanding questions about whether Riyadh will fully dedicate its nuclear project to international transparency, especially in view of its competition with Iran," he added. "Were Saudi Arabia to withhold from the IAEA critical information about its nuclear activities, that would increase tensions in the region but also between rivalling global powers," said Hibbs, explaining that this could hinder the Kingdom's ambitions. "Even if Washington is poised to be Riyadh's most suitable nuclear partner, any journey to nuclear capability is not without challenges and concerns" "Constructing a nuclear facility creates further risks. In the Middle East alone, numerous nuclear plants have been hit militarily over the years, such as in Syria, Israel, and Iran.

Nuclear policy, like much of U.S. defense policy, has rarely been informed by the views of the American public. On the contrary, the community of experts who drive how America postures its nuclear forces and determine what must be done to implement the president's vision is relatively small.

So building new ones adds another layer to the threat of regional escalation," said Sokolski. For now, facing several hurdles, such as the need for approval from Congress and Israel's reservations about Saudi uranium enrichment, as well as Riyadh's disengagement from normalisation talks, the path to an agreement remains clouded. Yet these past negotiations underpin how Riyadh still sees Washington as a crucial partner, despite its delicate balance to diversify relations between global powers.

Source: https://www.newarab.com/analysis/whats-behind-saudi-arabias-quest-nuclear-programme. 19 October 2023.

Last year, the Department noted that if China continued building nuclear weapons at the rate it appears to be today, it may have as many as 1,500 nuclear weapons by 2035. Last week, a bipartisan group of experts, representing a range of views on nuclear weapons, produced a report for Congress that recommended, in no uncertain terms, that the US must respond to this—and other developments—by preparing to quantitatively build up its own forces (among other measures).

OPINION – Ankit Panda

We are Sleepwalking into a New Nuclear Arms Race

In the coming months, Americans will hear more about nuclear weapons and their critical role in our national security than they have in years. In particular, they'll be told that for the first time in the more than 30 years since the Cold War ended, nuclear weapons are more important than ever. They'll be told that China's recent and unprecedented decision to massively build up its nuclear arsenal means the US must follow suit. They'll be told that to choose otherwise is foolish and even dangerous. The American people deserve and want to be armed with the knowledge to ask the right questions about nuclear proliferation and its importance for the national security of the US in the coming years.

Nuclear policy, like much of U.S. defense policy, has rarely been informed by the views of the American public. On the contrary, the community of experts who drive how America postures its nuclear forces and determine what must be done to implement the president's vision is relatively small. The choices the US makes with regard to its own nuclear forces can either heighten—or reduce—the risk of nuclear war. Right now, too many American nuclear experts are beginning to warm up to the idea of an arms race—and, if they have their way, this arms race is likely to look quite different from its Cold War predecessor. They are concerned that the US will face a security challenge that is unprecedented since the end of the Cold War: China is building up the number of nuclear weapons it possesses and will, sometime in the

2030s, join Russia as a nuclear "peer" of the US.

This is True: Beginning in 2021, satellite imagery collected by independent, nongovernmental analysts showed that Beijing had started building a large number of intercontinental-ballistic missile silos in its western desert. Before this, in 2020, the U.S. Department of Defense had publicly noted that China possessed a nuclear force numbering warheads in the "low-200s," a fraction of the 1,800 or so nuclear weapons the US deploys. Last year, the Department noted that if China continued building nuclear weapons at the rate it appears to be today, it may have as many as 1,500 nuclear weapons by 2035. Last week, a bipartisan group of experts, representing a range of views on nuclear weapons, produced a report for Congress that recommended, in no uncertain terms, that the US must respond to this—and other developments—by preparing to quantitatively build up its own forces (among other measures). If followed, the recommendations of this Strategic Posture Commission, as the group is known, would mark a dramatic reversal of more than three decades of continuity in American nuclear policy, and supercharge a new arms race.

Russia's brutal invasion of Ukraine, backed by overt and covert nuclear threats, paired with China's more muscular foreign policy in its neighborhood are legitimate sources of concern for anyone seeking a fairer, more just world, built on universal principles and norms. Against this backdrop, arms control—an important tool for predictability and transparency—has considerably frayed.

After the Cold War ended, the George H.W. Bush administration unilaterally drew down literally thousands of nuclear weapons deployed worldwide—partly as a gesture of goodwill to Moscow that Washington would not seek unilateral advantage as the Soviet Union crumbled. Since then, the number of deployed U.S. nuclear weapons have slowly trended downwards over Republican and Democratic administration: a consequence of arms control, unilateral nuclear policy choices, and normative considerations.

The Commission writes that they partly arrived at their recommendations in light of evidence that "the U.S.-led international order and the values it upholds are at risk from the Chinese and Russian authoritarian regimes." It is reasonable for Americans to share concerns that the world is fundamentally more primed for conflict between major powers than it has been in decades. Russia's brutal invasion of Ukraine, backed by overt and covert nuclear threats, paired with China's more muscular foreign policy in its neighborhood are legitimate sources of concern for anyone seeking a fairer, more just world, built on universal principles and norms. Against this backdrop, arms control—an important tool for predictability and transparency—has considerably frayed. The last remaining U.S.-Russia treaty on strategic nuclear arms was suspended by Moscow earlier this year.

But when Americans are told that the answer to these problems will be found with a decision to reverse decades of progress toward lowering the role of nuclear weapons in U.S. national strategy, they should be skeptical. While no word in Washington is perceived to convey more legitimacy unto a policy product than "bipartisan," the Strategic Posture Commission report does not, in its topline recommendations, match the true scope of debate around these issues in Washington. Most notably, the Biden administration itself appears to diverge substantially from the recommendations made by this Commission.

In a speech this June, Jake Sullivan, the president's adviser on national security affairs, noted that "the United States does not need to increase our nuclear forces to outnumber the combined total of our competitors in order to successfully deter them." He added that "we've been there," and "we've learned that lesson"—referring to the Cold War arms race. Proponents of a U.S. nuclear buildup like to note that Russia and China have already chosen to build up, so why shouldn't we? As Sullivan suggests, the compulsion to "do something" in response to the other side was the source of many poor decisions during the Cold War. That same compulsion is widely felt today as more and more American nuclear policy experts grow more uncomfortable

with the prospect that American nuclear superiority—a fact largely taken for granted in the post–Cold War decades—may be coming to a close.

The US can still choose to avoid an arms race, and it should make this choice because its security interests can be better served through other means—even in a world where the combined number of Russian and Chinese nuclear weapons aimed at our homeland is greater than our deployed forces by a factor of two. Nuclear deterrence, after all, does not demand nuclear superiority; the compulsion felt among many in Washington to build up is a product, instead, of how the US has done nuclear strategy since the 1960s. There are other ways forward, and the American people should ask the experts, thinkers, and leaders who work through these issues to consider these better alternatives. For instance, one solution might be found today with non-nuclear technologies and weapons. Missiles armed with conventional warheads have grown so precise and capable that, for years, Russian and Chinese experts have been concerned that such capabilities could degrade their nuclear forces. As Sullivan suggested in June, one answer for the US could be offsetting any new perceived nuclear "gap" with upgraded conventional weapons that might be fit for purpose.

The US can still choose to avoid an arms race, and it should make this choice because its security interests can be better served through other means—even in a world where the combined number of Russian and Chinese nuclear weapons aimed at our homeland is greater than our deployed forces by a factor of two. Nuclear deterrence, after all, does not demand nuclear superiority.

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Another solution may be found through a wholesale rethink of how the US implements its strategy of nuclear deterrence. Beginning in the 1960s, the US moved toward a strategy that privileges the limitation of damage against its homeland in a nuclear war. While this may sound like a laudable objective, it was in no small part responsible for contributing to arms-racing dynamics during the Cold War and even heightening the risk of unwanted nuclear war in a serious crisis. Washington might reassess the wisdom of such an approach and adopt a strategy that instead understands that nuclear deterrence can hold with a smaller number of deployed nuclear weapons: As long as any American adversary can be assured that the US will be able to retaliate for any nuclear attack against our homeland or our allies and deliver unacceptable damage in return, deterrence might hold. And nuclear weapons aren't the sole contributors to avoiding the failure of deterrence; America's capable conventional forces play a role, too.

Finally, proponents of a build-up should be careful what they wish for. One reason to avoid an arms race in the twenty-first century is simply that the US is not well positioned to win one. For starters, fiscal and political constraints in Washington mean that the country will never go back to spending close to what it once spent, as a percentage of GDP, on nuclear weapons and national defense. With defense spending already bulging close to $800 billion in nominal terms, various constituencies within the Department of Defense feel that their priorities are not being met; allowing nuclear weapons spending to surge would be both infeasible and imprudent. More practically, the US is already modernizing its nuclear forces and has budgeted to do so. The decisions driving this modernization should not be treated as sacrosanct, but the plans are already sealed into hard-fought programs of record, which have very

little leeway for expansion or change. In fact, choosing to alter these realities will undoubtedly eat into other non-nuclear defense priorities that could actually play a much more important role in deterring the emergence of a major crisis with American adversaries that could spiral into a war where nuclear weapons become salient.

A final arms-racing constraint is America's ability to actually build more nuclear weapons. Early in an arms race, the US could get away with what's known as "uploading" existing forces: removing warheads from storage and putting more of them on our currently deployed submarines and intercontinental missiles. But should Russia and China, two authoritarian states with far more political and economic flexibility to respond do so along similar lines, the US would find itself hard-pressed to build more nuclear weapons. America's plan to build plutonium pits is hamstrung by cost overruns, mismanagement, and delays, and is designed to do little more than support the maintenance of aging nuclear weapons, in any case.

Nuclear deterrence doubtless remains important for U.S. national security and the security of American allies. It has, for instance, allowed the US and our European partners to arm Ukraine without suffering Russian attacks. (At the same time it has also restricted our ability to further help the Ukrainians by making the prospect of directed armed involvement in Ukraine too risky.) The changing global nuclear environment and the fever that's gripped nuclear experts in Washington amid the emergence of "two nuclear peers" in Russia and China are likely to elevate these questions in national politics. For the first time since the end of the Cold War, presidential candidates may be asked about nuclear weapons, arms races, and even nuclear war. These are important questions that deserve serious thought and consideration. American taxpayers and citizens are owed better answers than those recommendations that would see the country sleepwalk into a nuclear buildup out of a compulsion to "do something" about what America's authoritarian adversaries have chosen to do with their own nuclear weapons. Keeping the US and its allies secure does not require making choices that lead to an arms race that will inevitably endanger everyone.

A Pentagon report on China's military power says Beijing is exceeding previous projections of how quickly it is building up its nuclear weapons arsenal and is "almost certainly" learning lessons from Russia's war in Ukraine about what a conflict over Taiwan might look like. China may be pursuing a new intercontinental missile system using conventional arms that, if fielded, would allow Beijing "to threaten conventional strikes against targets in the continental US, Hawaii and Alaska.

Source: https://newrepublic. com/article/176118/new-nuclear-arms-race-washington. 24 October 2023.

NUCLEAR STRATEGY

CHINA

China Expanding Nuclear Arsenal Much Faster than Predicted, US Report Says

A Pentagon report on China's military power says Beijing is exceeding previous projections of how quickly it is building up its nuclear weapons arsenal and is "almost certainly" learning lessons from Russia's war in Ukraine about what a conflict over Taiwan might look like. The report released on October 16 also warns that China may be pursuing a new intercontinental missile system using conventional arms that, if fielded, would allow Beijing "to threaten conventional strikes against targets in the continental US, Hawaii and Alaska." The China report comes a month before an expected meeting between Chinese leader Xi Jinping and President Biden on the sidelines of the Asia-Pacific Economic Cooperation summit in San Francisco. The annual report, required by Congress, is one way the Pentagon measures the growing military capabilities of China, which the US government sees as its key threat in the region and America's primary long-term security challenge.

But after Hamas's 7 October attacks on Israel, the US has been forced again to focus on the Middle East, instead of its widely promoted pivot to the Pacific to counter China's growth. The US is rushing weapons to Israel while continuing to support and deliver munitions to Ukraine in its 20-month struggle to repel Russia's invasion. Still, the Pentagon's national defense strategy is shaped around China remaining the greatest security challenge for the US, and that the threat from Beijing will determine how the US military is equipped and shaped for the future. The Pentagon report builds on the military's warning in 2022 that China was expanding its nuclear force much faster than US officials had predicted, highlighting a broad and accelerating buildup of military muscle designed to enable Beijing to match or surpass US global power by midcentury.

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Last year's report warned that Beijing was rapidly modernizing its nuclear force and was on track to nearly quadruple the number of warheads it has to 1,500 by 2035. The US has 3,750 active nuclear warheads. The 2023 report finds that Beijing is on pace to field more than 1,000 nuclear warheads by 2030, continuing a rapid modernization aimed at meeting Xi's goal of having a "world class" military by 2049. After the previous report, China accused the US of ratcheting up tensions and Beijing said it was still committed to a "no first use" policy on nuclear weapons.

The Pentagon has seen no indication that China is moving away from that policy but assesses there may be some circumstances where China might judge that it does not apply, a senior US defense official said without providing details. The official briefed reporters on 15 October on condition of anonymity before the report's release. The US does not adhere to a "no first use" policy and says nuclear weapons would be used only in "extreme circumstances"....

Source: https://www.theguardian.com/world/2023/oct/20/china-expanding-nuclear-arsenal-much-faster-than-predicted-us-report-says. 20 October 2023.

PAKISTAN

Pakistan Test-Fires Ababeel Nuclear Missile

Pakistan has test-fired an Ababeel missile capable of carrying multiple warheads that can attack different targets. Pakistan last tested the multiple independently targetable reentry vehicles-capable weapon on Jan. 24, 2017. The military's media branch, ISPR Pakistan, stated 15 October's test was meant to revalidate "various design, technical parameters, and performance evaluation of different sub-systems" and was "aimed at strengthening deterrence and enhancing strategic stability in the region." The Strategic Plans Division, which handles Pakistan's nuclear deterrent, did not respond to *Defense News*' request for information about the latest test. In 2017, the public relations organization stated the Ababeel had a 2,200-kilometer (1,367-mile) range and was developed to ensure the "survivability of Pakistan's ballistic missiles" in a region in which state actors are bolstering countermeasures. ...

Source: https://www.defensenews.com/global/asia-pacific/2023/10/21/pakistan-test-fires-ababeel-nuclear-missile/. 21 October 2023.

RUSSIA

Russia's Vladimir Putin Pictured in China with 'Nuclear Briefcase': What it Contains

Russian President Putin was filmed in China accompanied by officers carrying the so-called nuclear briefcase on October 18. The footage, which was released by Chinese state media, showed President Putin walking to a meeting with Chinese President Xi surrounded by security and followed by two Russian naval officers in uniform

each carrying a briefcase. The nuclear briefcase is a specially outfitted briefcase that contains the codes and other materials that the Russian president would need to authorize a nuclear strike. It is always accompanied by the president, even when he is traveling abroad. Russia's nuclear briefcase is generally carried by a naval commander. The briefcase, dubbed the "Cheget" (after Mount Cheget in the Caucasus Mountains), is always with the president but is rarely videotaped. "There are certain suitcases without which no trip of President Putin's is complete," the Kremlin correspondents of state news agency RIA said in a Telegram post alongside the footage....

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"This is not a coincidence," Rebekah Koffler, president of Doctrine & Strategy Consulting and a former Defense Intelligence Agency officer, told Fox News Digital. "The Kremlin almost certainly deliberately orchestrated the filming of President Putin's version of the 'nuclear football' – which is almost never done — and had the Russian media, which the Kremlin controls, highlight the fact that 'certain suitcases' always accompany the Russian president on trips,"...Mr Putin's trip to China came at a time when he needed to rally support for his cause at home, since his invasion of Ukraine has dragged on for 20 months longer than the roughly two weeks his advisors predicted would be required to conquer Kyiv and then take control of the country.

The US president has a similar device, dubbed the "nuclear football." The satchel holds the codes the president would use to authenticate an order to launch nuclear missiles should he or she not be at the White House. The Ukraine war has raised tensions between Moscow and Washington to the highest level since the 1962 Cuban Missile Crisis just as China seeks to bolster its nuclear arsenal to accord with its status as an emerging superpower....The briefcase is essentially a secure communication instrument that connects the president to his military top commanders and, from there, to rocket troops via the highly classified "Kazbek" electronic command-and-control network. Kazbek also supports the "Kavkaz" system.

Source: https://www.businesstoday.in/latest/world/story/russias-vladimir-putin-pictured-in-china-with-nuclear-briefcase-what-it-contains-402826-2023-10-20. 20 October 2023.

Russia and the US conduct regular nuclear readiness simulations - Moscow has traditionally held its own towards the end of October. The exercises this year involved "delivering a massive nuclear strike by strategic offensive forces in response to an enemy nuclear strike", Mr Shoigu reported to President Putin.

Russia Says It Rehearsed 'Massive' Nuclear Strike

Russia has rehearsed its ability to deliver a "massive" nuclear strike, the Kremlin says. The military exercise involved delivering a "response to an enemy nuclear strike", Defence Minister Shoigu said. State TV showed him recounting the rehearsal to President Putin. It comes as Russia's parliament backed the withdrawal of Moscow's ratification of a global treaty that bans all physical testing of nuclear warheads. Russia and the US conduct regular nuclear readiness simulations - Moscow has traditionally held its own towards the end of October. The exercises this year involved "delivering a massive nuclear strike by strategic offensive forces in response to an enemy nuclear strike", Mr Shoigu reported to President Putin. A Kremlin statement said that "practical launches of ballistic and cruise missiles" had taken place. A Yars intercontinental ballistic missile was fired

from a test site in Russia's far-east, and another missile was fired from a nuclear-powered submarine in the Barents Sea, the statement said.

Earlier this October, President Putin said Russia had held a "final successful test" of a nuclear-powered cruise missile. The experimental weapon, first announced in 2018, was hailed as having a potentially unlimited range, but President Putin's account has not been independently confirmed. The latest tests will be seen as a display of force which coincides with Moscow de-ratifying an international nuclear test ban treaty. Parliament completed the passage of a law that withdraws Russia's ratification of the treaty on October 22. Mr Putin called upon ministers to back the change to reflect the position of the US, which signed but never ratified the CTBT. The CTBT, agreed in 1996, bans "any nuclear weapon test explosion or any other nuclear explosion" anywhere in the world. Russia waged a full-scale invasion in Ukraine in February 2022, raising concerns over nuclear war. In June, Russia stationed a first batch of tactical nuclear weapons in Belarus. Mr Putin told a forum they would only be used if Russia's territory or state was threatened. The US government says there is no indication the Kremlin plans to use nuclear weapons to attack Ukraine.

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Source: https://www.bbc.com/news/world-europe- 67222213. 26 October 2023.

Russia Revokes Ratification of CTBT

The CTBT, adopted in 1996, is the first international treaty to ban all nuclear tests. It has 187 states which have signed, and 178 which have ratified, but has not entered into force yet because of the failure of eight states, upon whose ratification the entry into force of the treaty depends: China, the Democratic People's Republic of Korea, Egypt, India, Iran, Israel, Pakistan and the US. The TPNW is the only international treaty in force with a categorical ban on nuclear testing (Article 1(a)). The move by the Russian Duma came after explicit calls from Russian President Putin to withdraw from the treaty. On Friday October 6th, President Putin stated that, in regards to the CTBT, he sees it fit to "mirror the manner of the US," which has signed but not ratified the treaty, and revoke Russia's ratification. He added that "this is a question for the State Duma [lower house of the Federal Assembly of Russia] deputies. In theory, this ratification could be revoked." On October 9th, the Duma's Committee on International Affairs was instructed to contact the Russian Foreign Ministry to look into the issue of withdrawing the ratification of the CTBT. As a signatory to the Treaty, Russia still retains the responsibility not to engage in any behaviour that would defeat the Treaty's object and purpose, according to Article 18 of the Vienna Convention on the Law of Treaties.

The TPNW is the only international treaty in force with a categorical ban on nuclear testing (Article 1(a)). The move by the Russian Duma came after explicit calls from Russian President Putin to withdraw from the treaty.

Nuclear testing has had devastating humanitarian and environmental consequences around the world. The former Soviet Union's hundreds of nuclear tests in the Arctic and across Eastern Europe and Asia left a legacy of medical, psychological and socio-economic trauma, displacement of Indigenous peoples and contaminated the environment with radiation for generations to come. ICAN Executive Director Melissa Parke condemned the move, saying: "Russia must reverse this irresponsible decision immediately. International treaties, including the CTBT and the TPNW, are critical to making sure

nuclear testing which has harmed people's health and spread lasting radioactive contamination, is not resumed. Russia must remain fully committed to the CTBT and all countries that have not joined the CTBT and the TPNW should do so as a matter of urgency."

The nearly 150-page report offered 81 recommendations, but the panel highlighted, among others, a need to bolster conventional forces and address a dwindling nuclear workforce. The report's timeframe examined the last 14 years since the 2009 report with a focus on 2027 to 2035, and the transition phase stretching from present to 2027.

Source: https://www.icanw.org/russia_revokes_ratification_of_nuclear_test_ban_treaty_ctbt. 18 October 2023

USA

U.S. Strategic Posture Called 'Insufficient' for Future Threats

A report from the U.S. Strategic Posture Commission released in October 2023 found the US' current nuclear forces are not sufficient for future threats posed by China and Russia. The nation is on the cusp of a "fundamentally different global setting for which we did not plan and we are not well prepared," Madelyn Creedon, the commission chair of the Commission on the Strategic Posture of the US, and Brookings Institute nonresident senior fellow, said during a Hudson Institute panel discussion Oct. 23. Rebeccah Heinrichs, a commissioner and Hudson Institute senior fellow, called the difference between the last report in 2009 and the commission's current findings "dramatic," including how optimistic the commissioners were 14 years ago about the direction of the threats facing the US. "We are facing two nuclear peers and that is unprecedented," Creedon said. "And so the nation must act now and with a sense of urgency. Steps need to be taken again now to enable both near and longer term decisions."

While recognizing the imperative of the modernization strategy, the report also found it wasn't enough. Avoiding specific numbers, the report recommended increases in the planned number of deployed Long-Range Standoff Weapons, B-21 bombers and Columbia-class submarines.

The nearly 150-page report offered 81 recommendations, but the panel highlighted, among others, a need to bolster conventional forces and address a dwindling nuclear workforce. The report's timeframe examined the last 14 years since the 2009 report with a focus on 2027 to 2035, and the transition phase stretching from present to 2027. Creedon called out five assumptions she said underpin the report: Russia and China will continue to grow their nuclear arsenals, a 'one major war' construct is no longer viable, the foundational tenants of the U.S. Nuclear Strategy remain valid, strong allies and partners are essential, and the U.S. deterrent must be credible. The US needs to prepare for the possibility of a two-theater conflict, she said, "even if one of the conflicts is opportunistic. The U.S. defense and nuclear strategy must be implemented to effectively deter and defeat if deterrence fails simultaneous aggression in two theaters."

According to the report, that makes the execution of the nuclear modernization programs of record "urgent," which includes the replacement of all U.S. nuclear delivery systems, modernization of their warheads, comprehensive modernization of U.S. nuclear command, control and communications, and recapitalizing the nuclear enterprise infrastructure. While recognizing the imperative of the modernization strategy, the report also found it wasn't enough. Avoiding specific numbers, the report recommended increases in the planned number of deployed Long-Range Standoff Weapons, B-21 bombers and Columbia-class submarines. "We … feel that the currently planned number of Columbia-class submarines is insufficient," Marshall Billingslea, commissioner and Hudson Institute senior fellow, said during the panel. Current plans call for 12 of the new subs with the first to be delivered in 2031. He also said a third shipyard is needed to build

up capacity. "We will need to both increase plant production as well as a third shipyard in order to accomplish that," he said, also noting that the report recommends the current ballistic missile Ohio-class submarines "will need to be extended longer than originally planned." The report pays "a lot of attention" to the submarine force, "and it's not in a good place right now," he added....

Source: https://www. national defensemagazine. org/articles/2023/10/23/us-strategic-posture-insufficient-for-future-threat-report-finds. 23 October 2023.

BALLISTIC MISSILE DEFENCE

TAIWAN

Taiwan to Build 12 New Domestic TK III Missile Sites by 2026

Taiwan will build 12 new indigenous Tien-Kung or Sky Bow III (TK III) land-based surface-to-air missile sites by the end of 2026 to counter the threat of China's ballistic missiles, according to a Ministry of National Defense (MND) report. The report, sent to the Legislative Yuan on Oct. 20 for a defense budget review, said the new sites were needed based on the advice of Taiwan's top military research unit, the National Chung-Shan Institute of Science and Technology (NCSIST). It said the NCSIST has found that older generations of TK missiles it built, the TK IIs, could no longer counter the threat of the PLA's advanced ballistic missile systems and needed to be modernized. Consequently, the MND decided to upgrade its existing MIM-23 Hawk missile system sites and TK II missile sites and turn them into 12 new missile sites for the more advanced TK III land-based surface-to-air missile sites, the report said. It did not disclose how many existing TK III land-based surface-to-air missile sites Taiwan already has around the country.

Taiwan will build 12 new indigenous Tien-Kung or Sky Bow III (TK III) land-based surface-to-air missile sites by the end of 2026 to counter the threat of China's ballistic missiles, according to a Ministry of National Defense (MND) report.

The first phase of the project, the upgrading of six old missile sites into sites compatible with the TK IIIs, began in 2022 and is expected to be completed before the end of 2025. Work on the remaining six TK III missile sites began early 2023 and will be completed before the end of 2026, the MND said in the report. According to the NCSIST website, the TK III system is designed to engage different threats, including aircraft, cruise missiles, anti-radiation missiles, and short-range tactical missiles. The system can also launch older versions of missiles in the TK family, including TK I and II missiles. The TK III system is being operated in conjunction with the U.S.-bought PAC system as the backbone of Taiwan's low-altitude air defense system, the NCSIST said on its website.

Source: https://focustaiwan. tw/politics/ 202310230013. 23 October 2023.

USA

Aegis Proves Mettle against Multiple Simultaneous Missile Threats

The Aegis Combat System was successfully used for the first time against multiple anti-ship cruise missiles and ballistic missile defence targets as part of the Vigilant Wyvern Integrated Air and Missile Defence test, the US Navy Program Executive Office Integrated Warfare Systems and the MDA announced on 25 October. The live-fire raid scenario mounted from the Pacific Missile Range Facility in Kauai, Hawaii, under the US Indo-Pacific Command Area of Responsibility, showcased a concurrent Ballistic Missile Defence and Anti-Air Warfare raid.

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Vigilant Wyvern marked a notable milestone in development and provided evidence that ships equipped with the Aegis Combat System can defend against numerous threats simultaneously. "The success of this joint test represents a critical

step in defending against multiple targets in a realistic raid scenario," said RDML Douglas Williams, MDA Acting Director. "The Aegis weapon system successfully defeated multiple concurrent attacks, showcasing the incredible versatility of both this system and the crew of the USS Carl M. Levin. My congratulations to the entire test team in achieving this milestone."

Vigilant Wyvern showcased the impressive capabilities of a ballistic missile defence-configured Aegis ship aboard the USS Carl M. Levin and a Arleigh Burke-class destroyer. The vessel successfully detected, tracked, engaged and intercepted two short-range ballistic missile targets. Additionally, it demonstrated its ability to engage two subsonic anti-ship cruise missile drone targets, showcasing its Anti-Air Warfare (AAW) capabilities.

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Source: https://www.naval-technology.com/news/aegis-proves-mettle-against-multiple-simultaneous-missile-threats/?cf-view. 26 October 2023.

NUCLEAR ENERGY

GENERAL

Electric Power Research Institute Supports New NEA Joint Project on Waste Integration for Small and Advanced Reactor Designs (WISARD)

The Nuclear Energy Agency (NEA) announced a new collaboration with the Electric Power Research Institute (EPRI) on an upcoming NEA Joint Project focusing on waste management strategies for SMRs and advanced nuclear energy systems. Following the inaugural government-industry conference, NEA Director-General William D. Magwood, IV, and EPRI Senior Vice President Neil Wilmshurst finalised EPRI support for the development of the project. WISARD will bring together experts from all areas of the nuclear power life cycle to consider how these innovative systems may require equally innovative waste management solutions.

EPRI is the first financial backer of WISARD and anticipates a productive collaboration with the NEA to support a robust and ongoing commitment to sustainability in future nuclear systems. The WISARD project programme of work seeks to capitalise on the current opportunity to integrate sustainable waste management strategies from the very beginning of SMR and advanced reactor development. The project will create a first-of-a-kind international platform focusing on the specific characteristics of used fuel and radioactive waste from SMRs and advanced reactors. Subsequent work will then build on this knowledge to assess the suitability of current waste management solutions for the next generations of spent fuel and radioactive waste. The project will focus on four key used fuel and radioactive waste topics: Long-term disposal, Transportation; Treatment, recycling and reprocessing; Intermediate storage.

By assessing the back-end impacts of front-end and reactor design decisions, the WISARD project will enable early identification of future issues to provide system vendors, facility operators and government bodies with the opportunity to address problems in an efficient and sustainable manner. EPRI's extensive experience of collaborating with scientists, engineers, governments and academia to drive innovation from conception to shutdown will be a valuable addition to the WISARD project.

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government bodies with the opportunity to address problems in an efficient and sustainable manner. EPRI's extensive experience of collaborating with scientists, engineers, governments and academia to drive innovation from conception to shutdown will be a valuable addition to the WISARD project. The EPRI aim to shape the future of energy by identifying issues, technology gaps and the broader needs of the energy sector complements the WISARD project goals. The NEA will continue to seek opportunities to collaborate on an international scale to support the sustainability of next-generation nuclear systems.

Source: https://www.oecd-nea.org/jcms/pl_87253/electric-power-research-institute-supports-new-nea-joint-project-on-waste-integration-for-small-and-advanced-reactor-designs-wisard. 26 October 2022.

IAEA Sees Nuclear Power Doubling by 2050

While the IAEA continues to increase its forecasts for the amount of nuclear energy that will be installed it is also calling for a "level playing field" on energy policies and access to financing. The IAEA has revised its global growth projections for a third straight year, stating that a growing number of countries are now looking at nuclear power as a clean and reliable energy source to address the challenges of energy security, climate change and economic development. "Climate change is a big driver, but so is security of energy supply," IAEA director general Grossi said. "Many countries are extending the lifetime of their existing reactors, considering or launching construction of advanced reactor designs and looking into SMRs, including for applications beyond the production of electricity." In its high case scenario, the IAEA has forecast that installed capacity will more than double by 2050 to 890 gigawatts electric (GW(e)) compared with today's 369 GW(e). In the low case, capacity increases to 458 GW(e).

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Political Changes Needed:

However, it warned that those positive numbers are at risk without a change in attitude from some governments and financial institutions. "We must continue to push for a level playing field for nuclear energy, in terms of policies and access to financing, which can allow the technology to benefit from similarly favourable conditions that helped to deploy renewable energy technologies at scale over the last decade," Hamad Alkaabi of the UAE said. "Long term energy policies, innovative electricity market designs and technology-neutral sustainable finance frameworks that recognise nuclear's contribution to energy system reliability, flexibility and decarbonisation are needed." Currently, 31 countries operate nuclear power, which provides more than 9% of the world's electricity but accounts for around 25% of its clean electricity. Another 30 countries or so are embarking on or considering the introduction of nuclear power, with/ support from the IAEA....

The IAEA says that as well as providing clean electricity 24 hours a day, nuclear power could also radically cut emissions in industry, transportation and buildings, known as the hard-to-abate sectors, which are responsible for 60% of global greenhouse gas emissions. Nuclear power can produce process heat for industries such as cement and steel making, clean hydrogen for transport and other uses, district heating for buildings and also help address the growing global need for fresh drinking water by reducing the carbon footprint of desalinisation.

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buildings and also help address the growing global need for fresh drinking water by reducing the carbon footprint of desalinisation. "Nuclear power is the only technology that can produce at scale the three low-carbon energy vectors needed to reach net zero: electricity, heat and hydrogen," Mr Alkaabi said. "Unfortunately, there is a large disconnect between what nuclear technology can deliver and how this potential is portrayed in climate scenarios that inform policymakers."

$2.8 Billion French Investment: One new investment that is expected to help grow nuclear capacity is an expansion of Orano's Georges Besse uranium-enrichment plant in southern France. The international nuclear fuel cycle company will invest around $2.8 billion to expand the Georges Besse 2 facility by more than 30%. Orano says the site will eventually process enough uranium to generate nuclear power for the equivalent of 120 million households a year. "In the current geopolitical context, the purpose of this increase in enrichment capacities is to strengthen Western energy sovereignty in France," Claude Imauven, Orano's chairman said. "Orano's decision responds to requirements expressed by our customers to strengthen their security of supply, with production expected to start up as of 2028."

Source: https://smallcaps.com.au/iaea-sees-nuclear-power-doubling-2050/. 24 October 2023.

INDIA

PM Modi, Nuclear Watchdog Chief Explore Avenues for Expanding Nuclear Energy

Prime Minister Modi met with IAEA Director General Grossi on October 20 and held discussions on exploring avenues for expanding the role of nuclear energy to meet the net zero commitment. Both the leaders also discussed how to extend nuclear technology applications in areas like food, health, water treatment and countering plastic pollution in the Global South. "Had a fruitful discussion with Director General Grossi on enhancing enduring partnership between India and IAEA," PM Modi posted on social media platform X. "Explored avenues for expanding the role of nuclear energy to meet our net zero commitment and extending nuclear technology applications in areas like food, health, water treatment and countering plastic pollution in the Global South," he added....The two leaders also held discussions on Ukraine, the Indo-Pacific and the role of the IAEA in promoting peaceful use of nuclear S&T in areas such as energy, health, food and agriculture....

EAM Jaishankar also met IAEA Director General Grossi. The two discussed the developmental significance of nuclear energy and exchanged views on non-proliferation and international cooperation. "Good to see my friend DG @iaeaorg @rafaelmgrossi today. I congratulated him on his reappointment. Discussed the developmental significance of nuclear energy. Also exchanged views on non-proliferation and international cooperation. India will always be a strong and reliable partner of IAEA," the EAM wrote on 'X'....

On average, power generated by SMRs amounts to one-third generated by conventional nuclear power plants. In addition, SMRs leave less of a carbon footprint. They can also connect to pre-existing power grids or off-the-grid rural areas, thus proving their worth in supplying electricity to Indonesian regions with a significant lack of electricity connection.

Source: https://www.ndtv.com/india-news/pm-nuclear-watchdog-chief-rafael-grossi-explore-avenues-for-expanding-nuclear-energy-4507950. 23 October 2023.

INDONESIA

US Firms Plan to Build Pioneering Nuclear Power Plants in Indonesia

United States-based NuScale Power and ThorCon Power are planning to construct new nuclear power plants (PLTNs) in Indonesia despite the current lack of approval from the Indonesian government. NuScale Power plans to build SMRs, a proposed class of sophisticated nuclear power reactors capable of generating up to 300 MW(e) per unit. On average, power generated by SMRs amounts to one-third generated by conventional nuclear power plants. In addition, SMRs leave less of a carbon footprint. They can also connect to pre-existing power grids or off-the-grid rural areas, thus proving their worth in supplying

electricity to Indonesian regions with a significant lack of electricity connection.

The Energy and Mineral Resource Ministry's New and Renewable Energy and Energy Conservation Director General Yudo Dwinanda Priaadi stated that his agency had discussed plans to install a PLTN in Indonesia with NuScale Power. "We have talked with NuScale, and they said they are ready to start operations in 2032. We also asked if they can start in 2032 or 2039, and they said they are ready whenever," Yudo said on October 22. According to Yudo, NuScale has sufficient experience in constructing new nuclear power plants in multiple countries, including the US and Romania before setting sights on Indonesia. To fulfill net-zero emissions (NZE) targets, Yudo added that Indonesia would have to rely on clean energy-based power plants capable of generating electricity up to 31 GW. "We need 31 GW in the current NZE scenario, and yet, the draft government regulation for national energy policy sets the starting date to 2032.

By 2027, the power plant is set to be delivered to and installed in Bangka Belitung Islands, before collecting operational permission from the Nuclear Energy Regulatory Agency (BAPETEN) in 2029.

The point is, in the future, if we would like to talk about the scale of PLTNs, it would have to be in SMR-scale since we have many remote islands," said Yudo. Meanwhile, through its subsidiary PT ThorCon Power Indonesia, ThorCon Power aims to start the operation of thorium-based PLTNs in Indonesia in 2030. ThorCon Power Indonesia chief operating officer Bob S. Effendi said on October 20 that his company would start steel-cutting processes for its power plants at a South Korean shipyard in November 2024. By 2027, the power plant is set to be delivered to and installed in Bangka Belitung Islands, before collecting operational permission from the Nuclear Energy Regulatory Agency (BAPETEN) in 2029. Bob explained that his company's timeline was still under further discussion with BAPETEN, and ThorCon Power Indonesia would have to rely on a new presidential regulation (Perpres) on the construction of PLTNs in Indonesia.

Source: https://www.thejakartapost.com/business/2023/10/26/us-firms-plan-to-build-pioneering-nuclear-power-plants-in-indonesia.html. 26 October 2023.

KENYA

Kenya Hosts 4th Africa Youth Nuclear Summit

The 4th Africa Youth Summit was launched on October 23 at the Kenyatta International Conference Centre. The Summit will see over 2500 youth across the continent come together to explore the potential and promises of nuclear science and technology for economic sustainability, reliable and low carbon electricity generation for the future. During the launch, organizers challenged the youth in Africa to join the push for safe and secure application of nuclear technologies and further called on relevant stakeholders to ensure adequate resources and political goodwill as the continent expands its nuclear agenda. Speaking at the event, Nuclear Power and Energy Agency, Chief Executive Officer (CEO), Justus Wabuyabu, stated that Kenya has made significant steps in the implementation of the nuclear power programme, as it has carried out pre-feasibility studies on the nuclear power programme. He added that the country also enacted the Nuclear Regulatory Act of 2019, which established to put in place an independent nuclear regulatory body, Kenya Nuclear Regulatory Authority (KNRA). "The focus being on human capital, workforce, development, education, training, public participation and acceptance with the goal to attain high standards and practices, in nuclear safety, security, safeguards and non-proliferation," he added.

During the launch, organizers challenged the youth in Africa to join the push for safe and secure application of nuclear technologies and further called on relevant stakeholders to ensure adequate resources and political goodwill as the continent expands its nuclear agenda.

At the same time, Kenya Nuclear Regulatory Authority (KNRA), Director General (DG), James Keter, noted that, "We must now arise and change the narrative of nuclear power from that of war

and annihilation to progress and peaceful utilization." He also urged other Africa nuclear players to roll-up their sleeves and support the development and harmonization of nuclear policies, laws and regulations across the continent. Mr. Enobot Agborau, the Executive Secretary of the African Commission on Nuclear Energy, Nuclear Power and Energy Agency (NuPEA) urged African youth to proactively take part in policy decisions in their countries that will lead to conversations around nuclear technology as a means of addressing some of the continent's age-old challenges such as energy deficits. "The youth should build on the foundations built today and the legacy of the past. Nuclear will no doubt help expedite the search for solutions to many teething problems," he added.

Source: https://thesharpdaily.com/kenya-hosts-4th-africa-youth-nuclear-summit/. 24 October 2023.

USA

Nuclear to Be Part of US Clean Hydrogen Hubs

US President Biden and Energy Secretary Granholm have announced seven regional clean hydrogen hubs that will share USD7 billion in federal funding to accelerate the commercial-scale deployment of low-cost, clean hydrogen. Nuclear energy features in the plans of several of them, including a large nuclear-powered clean hydrogen production facility at Constellation's LaSalle plant in Illinois. The seven hubs will be funded under the Bipartisan Infrastructure Law to kickstart a national network of clean hydrogen producers, consumers, and connective infrastructure while supporting the production, storage, delivery, and end-use of clean hydrogen, according to the Department of Energy (DOE). Known as H2Hubs, it is expected that they will collectively produce 3 million tonnes of hydrogen annually, reaching nearly a third of the 2030 US hydrogen production target and lowering emissions from hard-to-decarbonise industrial sectors, and resulting in a reduction of 25 million tonnes of end-use carbon emissions each year…The announcement is one of the largest investments in clean manufacturing and jobs in history, the White House said, with the federal investment being matched by recipients to leverage a total of nearly USD50 billion to strengthen local economies, create and maintain high-quality jobs and slash emissions. "Unlocking the full potential of hydrogen - a versatile fuel that can be made from almost any energy resource in virtually every part of the country - is crucial to achieving President Biden's goal of American industry powered by American clean energy, ensuring less volatility and more affordable energy options for American families and businesses," Granholm said.

The announcement is one of the largest investments in clean manufacturing and jobs in history, the White House said, with the federal investment being matched by recipients to leverage a total of nearly USD50 billion to strengthen local economies, create and maintain high-quality jobs and slash emissions.

Integral Nuclear: Constellation Energy, which earlier this year began operating a first-of-its-kind 1 MW demonstration scale, nuclear-powered clean hydrogen production facility at the Nine Mile Point nuclear power plant in New York state, is a major participant in the MachH2 hub. The company said it will use a portion of the hub funding to build the world's largest nuclear-powered clean hydrogen production facility at its LaSalle Clean Energy Center in Illinois. The facility will cost an estimated USD900 million, a portion of which will be offset by the MachH2 award, Constellation said, and will employ lessons learned from Nine Mile Point.

The project will produce an estimated 33,450 tonnes of clean hydrogen per year and create thousands of "good-paying" jobs. Constellation President and CEO Joe Dominguez said tax credits such as those contained in the Inflation Reduction Act - allowing hydrogen production using carbon-free power from existing nuclear power plants - are vital if such projects to go ahead.

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Act - allowing hydrogen production using carbon-free power from existing nuclear power plants - are vital if such projects to go ahead. "Today's award is proof positive that DOE and the administration want existing nuclear energy to play a vital role in jumpstarting domestic hydrogen production and we look forward to final Treasury Department guidance," he said.

Xcel Energy, part of the Heartland Hydrogen Hub, said it expects to receive a large portion of the federal award, subject to negotiations. In its application, the company proposed investing up to USD2 billion over a decade for clean hydrogen-producing equipment and infrastructure and plans to use its existing and future nuclear, solar and wind resources in the Upper Midwest to produce hydrogen to blend into power generation, existing natural gas distribution systems, and agricultural and industrial applications. The company owns and operates two nuclear power plants in the region, a single boiling water reactor at Monticello and two pressurised water reactors at Prairie Island. "Clean fuels are a critical component of enabling economy-wide decarbonisation. The Heartland Hydrogen Hub is a game-changing initiative that demonstrates how we're accelerating the development of the next generation of clean energy technology with significant benefits for our customers and the environment," said Xcel Energy Chairman, President and CEO Bob Frenzel. ...

Source: https://world-nuclear-news.org/Articles/Nuclear-to-be-part-of-US-clean-hydrogen-hubs. 17 October 2023.

URANIUM PRODUCTION

CANADA

Cameco / Canada Uranium Miner Gets 20-Year Extensions for Three Sites

Canada's nuclear regulator has renewed licences that authorise Cameco to continue to operate the Key Lake, McArthur River and Rabbit Lake uranium sites in northern Saskatchewan for an additional 20 years. The Canadian Nuclear Safety Commission (CNSC) said the renewed licences for Key Lake and McArthur River are valid until 31 October 2043 and the licence for Rabbit Lake until 31 October 2038. CNSC said one of the licence renewal conditions is that Cameco must provide "comprehensive updates" on activities at the three sites. For Key Lake the updates are due in 2030 and 2037, for McArthur River they are also due in 2030 and 2037, and for Rabbit Lake in 2030. Cameco applied for 20-year licence renewals on 4 November 2022.

The company expects the Cigar Lake mine to produce up to 16.3 million pounds of uranium concentrate at a 100% basis in 2023. Cameco previously estimated the mine would generate 18 million pounds of uranium. In August 2023, Cameco raised its consolidated revenue outlook for 2023 as demand for nuclear power grows in the transition away from fossil fuels, even as the company reported a 14% drop in revenue in its second quarter.

Rabbit Lake and McArthur River are both uranium mines. Key Lake is a mill that processes uranium ore. Cameco put the Rabbit Lake Operation into a state of care and maintenance in 2016 because of economic factors. CNSC said Cameco has not indicated whether it plans to restart production at Rabbit Lake. Production was suspended at McArthur River and Key Lake for approximately four years beginning in January 2018 due to what it called "persistent weakness in the global uranium market". Cameco said recently it was lowering its 2023 production guidance due to challenges at Key Lake and another uranium mine, Cigar Lake, also in Saskatchewan. The company expects the Cigar Lake mine to produce up to 16.3 million pounds of uranium concentrate at a 100% basis in 2023. Cameco previously estimated the mine would generate 18 million pounds of uranium. In August 2023, Cameco raised its consolidated revenue outlook for 2023 as demand for nuclear power grows in the transition away from fossil fuels, even as the company reported a 14% drop in revenue in its second quarter.

Source: https://www.nucnet.org/news/canada-uranium-miner-gets-20-year-extensions-for-three-sites-10-5-2023. 27 October 2023.

USA

Peninsula Establishes New US Uranium Project

Uranium developer Peninsula Energy has established a new uranium development project, the Dagger project, which boasts an initial mineral resource estimate of 6.9-million pounds of uranium oxide. The Dagger project is about 20 km northeast of the company's flagship Lance facilities in Wyoming, US. MD and CEO Wayne Heili said on October 20 that Dagger provided Peninsula with an exciting opportunity to further increase the size and scale of its already sizeable mineral resource inventory. "Dagger perfectly complements the Lance projects, which once in production, will be one of the largest uranium in-situ recovery operations in the US. The establishment of the highly prospective Dagger Project adds greater depth and expansion optionality to our growing company…. This strategic development comes at an opportune time with the US government looking to take meaningful action to reinvigorate its domestic uranium production and nuclear fuel cycle capacity, whilst the company continues preparing for the resumption of commercial production at our US-based Lance projects by late 2024," said Heili. Dagger provides the opportunity to develop a satellite production operation near Lance.

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Source: https://www.miningweekly.com/article/peninsula-establishes-new-us-uranium-project-2023-10-23. 23 October 2023.

NUCLEAR PROLIFERATION

GENERAL

Jamie Dimon: 'The Most Serious Thing Facing Mankind is Nuclear Proliferation'

JPMorgan Chase CEO Jamie Dimon is asked routinely where he sees the greatest threats to the global economy — and to mankind in general. Speaking on a panel in Riyadh, Saudi Arabia, the veteran financier stressed the gravity of the spread of nuclear weapons, which he placed ahead of climate change and other widely-referenced threats. "I hear people talking about ESG all the time," Dimon said on October 21, referring to the environmental, social and governance concerns and mandates for governments and companies. "I just would put on your table the most serious thing facing mankind is nuclear proliferation. If we're not sitting here 100 years from now, it will be nuclear proliferation. It's not our climate." International bodies and proliferation experts warn that the danger of nuclear weapons use is higher than it's been in decades, amid wars involving nuclear powers like Russia and the weakening of adherence to international nuclear treaties. "The risk of a nuclear weapon being used is currently higher than at any time since the depths of the Cold War," the UN wrote in a statement in March 2023…Earlier in October, Dimon said in a statement that came with JPMorgan's earnings release that "this may be the most dangerous time the world has seen in decades…

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Source: https://www.nbcdfw.com/news/business/money-report/jamie-dimon-the-most-serious-thing-facing-mankind-is-nuclear-proliferation/3368118/. 24 October 2023.

USA

Russia Accuses US of Violating Treaty with Nevada Nuclear Test

On October 20, Russia told state media outlets that it is closely monitoring experiments conducted by the US at a nuclear test site in Nevada. 'Bloomberg' reports that the DOE said the October 18 tests were conducted in order to, "validate new predictive explosion models." According to the DOE, the models can be used to help detect atomic blasts occurring in other

countries, even deep underground. Corey Hinderstein, deputy administrator for Defense Nuclear Nonproliferation at the National Nuclear Security Administration, said the U.S. test was meant to, "advance our efforts to develop new technology in support of U.S. nuclear nonproliferation goals.".

Russia's Interfax News Agency said that Dmitry Peskov, the Russian presidential press secretary, told the press that Moscow was aware of and monitoring the situation. Russia's Interfax News Agency said that Dmitry Peskov, the Russian presidential press secretary, told the press that Moscow was aware of and monitoring the situation. Earlier, the Federation Council [of the Federal Assembly of Russia] stated that the underground tests on October 18 in Nevada should be given an international legal assessment, since the US is a signatory to the CTBT and is obliged to refrain from violating this agreement, Via Interfax. Fox News reports that the timing of the U.S. test is notable, as it comes directly after Russian lawmakers announced their plan to revoke Moscow's ratification of the Nuclear Test Ban Treaty.

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While the treaty, which bans all nuclear explosions across the entire planet, was adopted in 1996, it has never been fully enforced. China, India, Pakistan, North Korea, Israel, Iran, Egypt and the U.S. have never ratified the treaty. Last week, Deputy Foreign Minister Sergei Ryabkov said that Russia would only resume nuclear tests if the U.S. did so first.

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Source: https://www.rrdailyherald.com/news/national/russia-accuses-us-of-violating-treaty-with-nevada-nuclear-test/video_f2d8f724-c401-5d8c-8f2e-72be5b72e439.html. 20 October 2023.

NUCLEAR SAFETY

AUSTRALIA

IAEA Mission Finds Progress in Nuclear and Radiation Safety in Australia, Notes Areas for Improvement

An IAEA mission said Australia has made significant progress in building a resilient and adaptable regulatory infrastructure for radiation safety. The team has also identified areas for potential enhancements, such as the completion of a national strategy on radiation safety. Noting ongoing activities to address consistency in the State and Territories radiation safety programmes, the team said further efforts were warranted in this area, which the establishment of a national strategy would support. The Integrated Regulatory Review Service (IRRS) team concluded a nine-day follow-up mission from 16 to 24 October to review progress of Australia's implementation of recommendations and suggestions made during an initial IRRS mission in 2018.

The follow-up mission was conducted at the request of the Government of Australia and hosted by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), the Commonwealth Government regulator. Under Australia's federal system of government, ARPANSA regulates Commonwealth entities and other entities are regulated by the respective regulatory bodies of the six States and two Territories. The majority of licenced activities in Australia are carried out under the supervision of state and territory regulatory bodies. The scope of the IRRS follow-up mission was the same as the scope of the 2018 mission, namely the regulatory framework for all nuclear and radiation facilities

and activities in Australia, Emergency Preparedness and Response, medical and occupational exposure situations, and public and environment protection. IRRS missions are designed to strengthen the effectiveness of the national nuclear and radiation safety regulatory infrastructure, based on IAEA safety standards and international good practices, while recognizing the responsibility of each country to ensure nuclear and radiation safety.

Australia does not have any nuclear power plants. Its one research reactor produces radioisotopes for medicine, research, and industry. Radiation sources are used in facilities and in activities in the field of research, industry, medicine, and agriculture. The country has storage facilities for low and intermediate level radioactive waste and plans to establish a national radioactive waste management facility.

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The IRRS team, comprised of seven senior regulatory experts from Canada, Finland, France, Ireland, UK, US, and three IAEA staff members, conducted a series of interviews with ARPANSA, government representatives and the State and Territory regulatory bodies, and reviewed relevant reference material. One of the most prominent challenges identified by the 2018 IRRS mission was the establishment of a national framework for radiation safety that ensures a consistent level of safety and protection for individuals and the environment across all jurisdictions, both in principle and regulatory practice.

In response, a series of activities have been undertaken at both national and jurisdictional levels. The adoption by all regulatory bodies of a

second edition of the National Directory for Radiation Protection (NDRP2) has laid the foundation for the adoption of nationally agreed radiation safety codes and standards but its implementation has not proceeded uniformly and promptly across all jurisdictions. "The team found progress in how Australia is approaching challenges in radiation safety," said Petteri Tiippana, Director General of the Radiation and Nuclear Safety Authority (STUK), Finland, and the IRRS team leader. "We underscored the importance of recognizing the substantial advantages of consistent regulation for public health, the regulated industry, and the efficient use of resources across the country as a whole."

The IRRS team recognized that substantial progress had been made in response to the 2018 findings. Out of the 23 recommendations and 12 suggestions, 16 recommendations and 10 suggestions have been successfully addressed and closed....The final mission report will be provided to the Government in about three months.

Source: https://www.iaea.org/newscenter/pressreleases/iaea-mission-finds-progress-in-nuclear-and-radiation-safety-in-australia-notes-areas-for-improvement. 24 October 2023.

UKRAINE

Russians Likely Targeted Khmelnytsky Nuclear Plant – Zelensky

A Russian drone attack on western Ukraine likely targeted a nuclear power plant, President Zelensky says. Iranian-designed Shahed drones struck the area around the power plant in the western Khmelnytsky region early on October 22, he said. The attack injured 20 people and caused light damage, including broken windows. The IAEA said the plant's operations were unaffected. "Powerful explosions shook an area near Ukraine's Khmelnytsky Nuclear Power Plant," IAEA Director General Grossi said in a statement. The blasts highlight "the dangers to nuclear safety" posed by the war, he added. The Khmelnytsky plant has two reactors. One is operating and one has been in planned outage since August. Fears of fighting affecting a nuclear power plant have been omnipresent since Russia first invaded Ukraine in February 2022. Russian forces have controlled the Zaporizhzhia nuclear power plant, in eastern Ukraine, since March 2022.

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Kyiv accuses Russia of shelling the plant and risking a radiation leak, behaviour it characterises as "nuclear terror". No serious accident has occurred since the full-scale invasion last year, however. Mr Zelensky said the attack in the Khmelnytsky region showed that Ukraine's air defences needed further support from international partners. He added that Russian drones and missiles contained components originating from Western companies and countries and the Khmelnytsky strike showed "how dangerous it can be when Russia can bypass international sanctions"....

Source: https://www.bbc.com/news/world-europe-67226741. 26 October 2023.

NUCLEAR SECURITY

UK

UK Cites Nuclear Plant Operator Over Cybersecurity Strategy

EDF placed under "significantly enhanced regulatory attention", as it is insisting "there is no risk to plant safety at our power stations". The UK Government's safety watchdog, the Office for Nuclear Regulation (ONR), has placed a nuclear firm on notice over its cybersecurity practices. In the chief nuclear inspector's annual report on Great Britain's nuclear industry, the ONR stated that EDF Energy has been placed on "significantly enhanced regulatory attention" after an inspection into its cybersecurity practices. The ONR decision to closely study the cyber credentials of a nuclear

power station operator in the UK, comes amid growing tensions about the cyber actions of hostile nation states.

EDF Cited: EDF it should be remembered is a French power utility, and it runs one nuclear power station in Scotland (Torness in East Lothian), as well four nuclear power stations in England. EDF is also building a new nuclear station at Hinkley Point in Somerset. In the chief nuclear inspector's annual report, EDF was cited for not providing the inspector with a "comprehensive and fully resourced cyber security improvement plan….EDF did not meet its commitment to provide us with a comprehensive and fully resourced cyber security improvement plan, as agreed, by end of March," the report stated. "Consequently, EDF's corporate centre has been moved to significantly enhanced regulatory attention for cyber security….EDF has made two new appointments to specifically address cyber security," the report stated. "We have subsequently met with EDF senior team to ensure regulatory expectations are understood"….

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Nuclear Security: The issue of cybersecurity and operators of nuclear power stations tends to a sensitive subject. In November 2020 a cyber-attack took down the official website of the Japanese nuclear regulator for a number of hours. In mid-2019 Indian officials confirmed that its newest nuclear power plant (the Kudankulam nuclear power plant) had been hacked. In 2017, the US had warned of ongoing online attacks on critical sectors including energy, nuclear and manufacturing. That came after the US DOE acknowledged a campaign of attacks that targeted a number of energy companies, including at least one nuclear plant. In 2016 a German nuclear power plant in Bavaria admitted that its systems were riddled with malware, and it was shut down as a precaution. In 2015 an attacker managed to hack into the systems of a nuclear power plant in South Korea. A computer worm was later discovered in a device connected to the control system, but the plant operator insisted that the breach had not reached the reactor controls itself. The hacker later posted files from the hack online and included a demand for money.

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Potential Red Flag: However, the decision by the chief nuclear inspector to place EDF under greater examination has prompted a reaction from a cybersecurity professional. "With the news that EDF failed to 'meet its commitment to provide us with a comprehensive and fully resourced cyber security improvement plan,' according to the UK chief nuclear inspector's annual report is an extremely worrying 'red flag' for the UK critical energy infrastructure as well as UK government and regulatory policy failing," noted Simon Chassar, CRO at Claroty. "The reason for this is that ISA/IEC 62443 series of standards was formerly approved and published in 2018 which was endorsed by the UN and across 20 different industries for securing ICS automation controls; 8 years after the Stuxnet malware which affects ICS environments causing them to malfunction and feed false data," said Chassar.

Stuxnet is thought to have been created by both Israel and the US, after it was discovered in 2010 when it was used to attack a uranium enrichment facility at Iran's Natanz nuclear site. "Nuclear power is a critical infrastructure for society power needs in the UK, generating 15 percent of the UK power but also a serious highly managed environmental risk," said Chassar. "A cyberattack on any nuclear generation station could create massive impacts on the UK whichever nation-state sponsored or criminal faction decided to target it," said Chassar. "The

UK Government should consider adopting the American NERC-CIP security regulation (which also applies to Canada and Mexico) for the UK energy sector as well as providing the regulator with an ability to enforce failure on cyber controls; with some consideration of direct control of technology adoption, loss of licenses and financial impacts. "Implementing a technology that quickly identifies connected physical assets and their vulnerabilities (CVE-CVSS) and known exploits (EPSS) is the immediate requirement so that a plan to reduce the inherent risk can start immediately; then start to connect anomaly alerts and known alerts into Security operations for monitoring," Chassar concluded.

Source: https://www.silicon.co.uk/security/security-management/uk-cites-nuclear-plant-operator-over-cybersecurity-strategy-535056. 20 October 2023.

USA

Luján, Blackburn Introduce Bipartisan Resolution Supporting Nuclear Security

New Mexico Democratic Senator Ben Ray Luján and Tennessee Republican Senator Marsha Blackburn introduced a bipartisan resolution supporting the IAEA in its role promoting nuclear security. "At a time of immense global conflict, the International Atomic Energy Agency plays a critical role upholding global safety standards and peaceful nuclear operations," Luján said in a press release. "In my home state of New Mexico, we've seen firsthand the impact nuclear weapons can have on the community and to the long-term health of our citizens. This resolution makes it clear that Senators on both sides of the aisle are committed to a fully funded IAEA that has the resources to carry out its vital safety mission." The IAEA was established in 1957 to help countries develop and use nuclear technology for peaceful purposes rather than warmaking. The IAEA also contributes to international peace and security as well as the United Nations' Sustainable Development Goals. The resolution asserts U.S. interests in preventing further nuclear weapon proliferation, securing nuclear materials and ensuring the IAEA has the resources needed to carry out its duties....

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Source: https://nmpoliticalreport.com/2023/10/27/lujan-blackburn-introduce-bipartisan-resolution-supporting-nuclear-security/. 27 October 2023.

NUCLEAR DISARMAMENT

GENERAL

Existence of Nuclear Weapons Creates Temptation, Risk of Use, First Committee Hears as it Unpacks Assumptions about Complex Path to Peace

Thematic Debate Begins on Other Mass Destruction Weapons: Disarmament is not a lofty ideal, but a practical imperative, the First Committee (Disarmament and International Security) heard on October 17 as it concluded its thematic debate on nuclear weapons and began debating other mass destruction weapons. Nuclear weapons, the most inhumane and indiscriminate weapons ever created, remain a constant spectre of destruction, Namibia's representative warned. Their sheer existence, capable of unimaginable harm to humanity and the planet, creates a temptation and risk of use. Decisions made today will impact the planet left to future generations, she cautioned. Zambia's speaker warned of a "probable risk" of nuclear war, as long as retention persists. Nuclear weapons have no place in the modern world, and there is no justification for their proliferation, testing and stockpiling. Their destructive power has fueled international tensions and created an uncertain, unsafe world. Relying on deterrence for security only perpetuates a cycle of fear, where mutually assured destruction looms over the world community, he said. The representative of Colombia echoed the deep concern about the fragile premise that nuclear defence and deterrence systems provide security. "We are on the brink of an abyss", she said. Two major nuclear Powers have suspended bilateral strategic dialogue and disagreements are increasing. The risk of a nuclear war is not zero, and the

assumption that it would be possible to contain the fallout is a "pipe dream".

As the Committee concluded its thematic debate on nuclear weapons and proceeded to discuss other weapons of mass destruction, several speakers reiterated that all such weapons — including biological and chemical weapons — must not be used by anyone, anywhere, under any circumstance and at any time. All those responsible for their use must be held accountable. The Russian Federation's delegate, speaking on behalf of a group of 14 States, condemned the use of chemical or biological weapons as repugnant to humankind's conscience. However, other speakers — such as the Czech Republic's representative — questioned the credibility of this condemnation, stating that the Russian Federation continues to spread disinformation about the "Syrian chemical dossier" and an alleged "military-grade biological programme" in Ukraine. In that vein, Germany's delegate denounced the Russian Federation's false allegations against Ukraine's biological threat reduction projects as an abuse of the Conventions on Biological and Chemical weapons, as well as another futile attempt to justify its war of aggression. At the outset, the President of the ninth Review Conference on the Biological Weapons Convention (BWC) briefed the Committee on its work....

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Source: https://press.un.org/en/2023/gadis3720.doc.htm. 17 October 2023.

NUCLEAR WASTE MANAGEMENT

CANADA

Goal of New Recycling Facility to Reduce Radioactive Waste

With an ambitious goal to greatly reduce the amount of nuclear waste in Ontario, the ribbon was cut on the Western Clean Energy Sorting and Recycling Facility near Kincardine, Ont. "We understand people's concerns around nuclear waste. Our ability to reduce the amount of nuclear waste that ultimately needs to be permanently disposed of is very important," said Jason Van Wart, CEO of Laurentis Energy Partners, a partner in the new nuclear waste recycling facility. 50 years of nuclear energy production has produced warehouses full of low and intermediate level nuclear waste, and over three million used nuclear fuel bundles, all of it radioactive. The new recycling facility, located near the Bruce Nuclear Station, is focusing on reducing the volume of Ontario's low-level waste, the least radioactive waste, such as like coveralls, mops, brooms and hand tools once used inside Ontario's nuclear plants. "We're finding that 60 to 70 per cent of that waste can actually be segregated and incinerated, and that reduces the volumes down 95 per cent. We're able to, in most cases, reduce the amount of waste that required to be in permanent disposal by 50 to 60 per cent," said Van Wart. Representatives from Laurentis Energy Partners, Ontario Power Generation, the Municipality of Kincardine, and Energy Solutions Canada cut the ribbon to open the Western Clean Energy Sorting and Recycling Facility near Kincardine, Ont. on Oct. 20, 2023. (Scott Miller/ CTV News London)

This is important as Ontario's nuclear industry embarks on aggressive growth to meet an increasing need for carbon-free electricity in Ontario that's expected to double or triple before 2050, according to Ontario Power Generation, Executive Vice President of Strategy and Commercial Management, Chris Ginther. ...It's not just new low level nuclear waste produced in Ontario that will end up being sorted there, it's the more than 100,000 cubic metres already stored on the Bruce Power site, where a large portion of Ontario's nuclear waste is currently being stored. The goal is to reduce the amount of low-level waste in half over the next decade. ... The Western Clean Energy Sorting and Recycling Facility near Kincardine, Ont. aims to reduce the amount of low-level nuclear waste that's required to stored permanently. By 2033, the goal is to reduce amount of low-level nuclear waste in storage by 50 per cent. (Scott Miller/CTV News London)

The facility has been open since August, and cost between $10 and $12 million to build. Approximately 30 people work at the new sorting and recycling facility. "The goal here is to minimize the effects of production. To reduce the by-products of nuclear energy, so it has less of an impact on the environment," explained Kincardine Mayor Ken Craig, who said he's excited about the opening of the new nuclear waste facility in his municipality. There is no permanent storage solution in Canada or Ontario for nuclear waste. The Nuclear Waste Management Organization has two communities interested in storing Canada's over three million used nuclear fuel bundles in an underground storage facility, and just released a report outlining plans to dispose of Canada's low level nuclear waste in multiple near surface buildings, while finding a host site for an underground facility to house the country's intermediate level, and non-fuel, high level nuclear waste.

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Source: https://london.ctvnews.ca/goal-of-new-recycling-facility-to-reduce-radioactive-waste-1.6616599. 25 October 2023.

JAPAN

Gov't to Spend $2.2 Billion Over 6 Years to Address Release of Contaminated Fukushima Water

The Korean government plans to spend more than 3 trillion won ($2.2 billion) over the next six years to address the release of contaminated water from the damaged Fukushima Daiichi Nuclear Power Plant in Japan, according to an opposition lawmaker. Adding to concerns is that there is no clear estimate of how many more decades the government will need to allocate funds to address the radioactivity issue, according to Rep. Jung Pil-mo of the main opposition Democratic Party of Korea (DPK), who claimed that the Yoon Suk Yeol administration's decision not to oppose Japan's release of the wastewater has already placed an enormous burden on the nation's finances. According to budget proposals of each ministry submitted by the National Assembly Budget Office to Rep. Jung, the total government budget to be disbursed by relevant ministries from this year through 2028 will amount to 3.14 trillion won.

The most substantial portion of the budget will be earmarked for a reserve program on marine products, which mandates the government purchase pre-selected species and release them during off-seasons when there is a reduced catch or during holiday seasons when there is elevated demand for marine products.

The majority of this budget, totaling 3.11 trillion won, is allocated to the Ministry of Oceans and Fisheries. Following this, the Nuclear Safety and Security Commission plans to execute 21.3 billion won, while the Ministry of Food and Drug Safety is set to disburse 9.6 billion won. In particular, the fisheries ministry's budget will increase from 504.5 billion won this year to 712.4 billion won next year. The total budget will be used to carry out 20 projects, aimed mostly at mitigating the potential losses that the fishing industry and fishermen may suffer from due to the release of the contaminated Fukushima water.

The most substantial portion of the budget will be earmarked for a reserve program on marine products, which mandates the government purchase pre-selected species and release them during off-seasons when there is a reduced catch or during holiday seasons when there is elevated demand for marine products. A total of 872.1 billion won will be invested in this program. The budget will also be designated for other sectors, including a purchase loan program that provides preferential loans to private warehouse owners and fishery co-ops, as well as initiatives to promote consumption and support discounts for marine products available to the public.

Moreover, a portion of the budget is expected to

be directed toward scientific endeavors, including the establishment of a monitoring system for marine radioactive materials and the development of rapid detection and prediction technology for radioactive contamination. "The government should estimate the extent of both direct and indirect damage and actively exercise its right to indemnity against the Japanese government, which proceeded with its plan to discharge contaminated water, even while recognizing that neighboring countries may be affected," Rep. Jung said.

Japan released its first discharge of treated wastewater from the Fukushima plant into the Pacific Ocean between Aug. 24 and Sept. 11, and the second between Oct. 5 and 23. Japan's Kyodo News reported on October 26 that the third discharge will begin on Nov. 2. The country plans to continue discharging contaminated water until 2051 to decommission the nuclear reactor at Fukushima.

Source: https://www.koreatimes.co.kr/www/nation/2023/10/113_362020.html. 28 October 2023.

NIGERIA

Firm Unveils Innovative Nuclear Waste Disposal Technology

The NST NuclearSAFE Technology has unveiled SuperLAT, a technological solution that promises to change the landscape of nuclear energy, with far-reaching implications for the global pursuit of carbon-free electricity. In a statement signed by Dr. Jimmy Etti-Williams, a co-founder of NST NuclearSAFE Technology, the company has introduced an innovation that would be a game-changer for the nuclear energy industry and the broader efforts to combat climate change with Nigeria's abundant reserves of unmined uranium and a global push for cleaner and more efficient power sources. The NST SuperLAT technology is designed to tackle the intricate problem of nuclear waste management while nuclear power generation offers a safe, efficient, and cost-effective solution for producing electricity, the responsible disposal of nuclear waste has long been a significant challenge. SuperLAT technology can process, package, load, store, and transport nuclear waste in casket containers to depths of several thousand feet underground. "SuperlLAT will process, package, load, store and transport nuclear waste in casket containers to several thousand feets underground. It can also be retrieved when needed as fuel in reactors to generate lower carbon electricity," Dr. Etti-Williams stated.

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This dual-purpose approach offers a solution not only to nuclear waste management but also aligns with global goals for reducing carbon emissions through the generation of low-carbon electricity. "SuperLAT is designed to offer a safe and economic alternative to meet the present and future Nuclear Waste challenges for a permanent Nuclear Waste Storage Technology that does not necessarily focus, primarily on the deep rock formation as ultimate protection of LLW and HLVW," he added. The innovative SuperLAT technology is rooted in geological nuclear waste disposal principles, adhering to universal regulations. This technology incorporates a complex engineering design model with an operational drilling system, ensuring the efficient, safe, and secure storage of nuclear waste in casket containers, located deep underground, thousands of feet below the Earth's surface. NST SuperLAT technology is designed for the permanent disposal of high and low nuclear spent fuel, as well as other radioactive waste materials, in deep geological rock formations, thousands of feet below the surface.

The company's commitment to safety and security is marked by its approach to disposing of low-level and high-level nuclear waste in ultra-deep geological repositories, situated 20,000 feet underground. This approach provides a level of confidence to the international community and stakeholders concerned about nuclear waste storage accidents, leakages, and the potential theft of nuclear materials.

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However, the significance of embracing NST NuclearSAFE Technology's SuperLAT technology extends far beyond the realm of waste management. For Nigeria, with its substantial uranium reserves. Establishing uranium plants for energy generation and industrial use could not only drive Nigeria's development but also serve as a model for other African nations seeking sustainable energy solutions. "Nigeria has uranium and with this technology, we need to have our own uranium plants for Nigerian and African growth.

The efforts of driving NST NuclearSAFE technology if and when embraced and supported, will increase safety across the industry and other areas of radiation technology. It will enhance the applications of Radiation Technology in the non-armament i.e., food processing and irradiation to reduce wastage, Nuclear Medicine treatment for thyroids, NDT for immediate example, surveys of leakages in our many dams and oil and gas pipelines including oil and gas well loggins that rely on nuclear devices to identify oil and gas well reservoirs," the statement noted. Etti-Williams and his team's innovation opens the door to a cleaner and more efficient nuclear energy landscape, with far-reaching implications for both the environment and humanity's sustainable future.

Source: https://guardian.ng/features/science/firm-unveils-innovative-nuclear-waste-disposal-technology/. 26 October 2023.

Centre for Air Power Studies

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