



STATEMENT – António Guterres, UN Secretary General

Message to the Opening of the First Meeting of States Parties to the Treaty on the Prohibition of Nuclear Weapons

Nuclear weapons are a global scourge. A deadly reminder of countries' inability to solve problems through dialogue and collaboration. These weapons offer false promises of security and deterrence — while guaranteeing only destruction, death, and endless brinksmanship.

Today, the terrifying lessons of Hiroshima and Nagasaki are fading from memory. The once unthinkable prospect of nuclear conflict is now back within the realm of possibility. More than 13,000 nuclear weapons are being held in arsenals across the globe.

In a world rife with geopolitical tensions and mistrust, this is a recipe for annihilation. We cannot allow the nuclear weapons wielded by a handful of States to jeopardize all life on our planet. We must stop knocking at doomsday's door.

The Treaty on the Prohibition of Nuclear Weapons is an important step towards the common aspiration of a world without nuclear weapons. Your gathering this week brings together governments, but also civil society groups and other observers. This wide participation reflects a central truth — Disarmament is everybody's

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business, because life itself is everybody's business. The decisions you make at this meeting will help cement the Treaty's position as an essential element of the global disarmament and non-proliferation architecture. And it will hopefully convince more countries to get on board. It

is only by joining in solidarity that we can eliminate this scourge and get back to the business of building a better, more peaceful and trusting world for all. Let's eliminate these weapons before they eliminate us.

Source: <https://www.un.org/sg/en/content/sg/statement/2022-06-21/secretary->

general%E2%80%99s-video-message-the-opening-of-the-first-meeting-of-states-parties-the-treaty-the-prohibition-of-nuclear-weapons, 21 June 2022.

OPINION – Sitakanta Mishra

Let's Not Ignore the Resilience of Nuclear Energy Industry

Though Covid-19 pandemic has impacted significantly the overall global energy sector, the nuclear energy industry remained mostly unaffected and uninterrupted. In many countries operations in different parts of the nuclear industry have continued, proving its inherent resilience in comparison to other sources of energy production.

This is not to argue that nuclear industry was completely untouched by the pandemic. Depending on the location, magnitude of spread, and health condition of employees, operations not vital to ensuring the continued operation of nuclear power plants may have been stopped. Due to workers health conditions and reduction of workforce, cutback in uranium production occurred in Kazakhstan, Canada, and Namibia; reactor newbuild schedule also got delayed for a short period in China, France, UAE, UK and USA. But production cutbacks in uranium have a positive impact on price since demand for uranium has not suffered to nearly the extent as the demand for oil during the pandemic. Rather the uranium price has increased 33 % from its lowest point registered in mid-March 2020 and has broken the \$30 level for the first time since 2016. Meanwhile, it would take just a couple of years up to 2025 to return to the accelerated level of new reactor build as registered during pre-pandemic phase.

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Nuclear energy caters about 10% of global electricity consumption which is carbon-free, produced in over 30 countries. During the pandemic, particularly in 2020, global nuclear consumption fell by 4.1%, falling the most in European Union (-11%), Japan (-33%) and the US (-2%) largely owing to depressed electricity demand, temporary shutdowns for maintenance, and permanent shutdowns. Meanwhile, nuclear power increased in China (5%) and Russia (3%), with new units being commissioned during the pandemic. In Belarus and the UAE, the first nuclear reactor entered commercial operation, with more units currently under construction. Nuclear power rebounded and increased 2% in 2021, reversing half of the decline in output within a year. Moreover, seven new reactors came online during 2020-2021.

Though in 2021, nuclear energy production stands 2% below the 2019 level, yet “nuclear remains the largest single source of low-carbon generation”, resilient and cost-effective energy system in major economies during Covid-19. In addition, no enforced shutdown of nuclear power reactor was undertaken due to the effects of Covid-19 pandemic on the workforce or supply chains. How the nuclear industry managed the pandemic situation when all other sectors couldn't withstand the supply chain disruptions, shifting consumer preferences, and the outright lockdown of many economic interactions?

In fact, the nuclear industry already has a robust safety culture in place worldwide. Before becoming a global pandemic, nuclear operators worldwide executed business continuity plans and took the

necessary steps for the dealing with the impact of the virus. The plant operators stepped up precautionary measures to stop the spread of coronavirus. In many countries nuclear employees have been identified as among the key workers that are essential to maintaining important infrastructure during the pandemic. Other precautionary measures like scaling down of staff, workforce self-isolation or quarantine, limiting non-essential business travel plans and carrying out business meetings online, remote handling of work, if possible, to maintain social distancing, etc. were stepped up that helped nuclear industry to deal with the pandemic induced risks. Overseas NPP construction projects by nuclear giants like Rosatom remain uninterrupted by strictly following the recommendations and guidelines of the disease control services of Russia, as well as measures by the host countries.

While combating the virus menace within the plant and its own workforce, the nuclear industry came handy to tackle the spread of the disease by providing diagnostic kits, equipment and training in nuclear-derived detection techniques supported by IAEA to countries looking for such assistance. In Russia, irradiation facilities had sterilized 7,853,480 medical masks (as of April 2020), as well as 151,000 portable lab kits to test for Covid-19. By maintaining the reactor operation, vital medical isotopes production and use continued for the diagnosis and treatment of other illnesses.

The pandemic may have touched the nuclear industry but could not derail it primarily for its internal resilience and sustainable industrial base. While any accelerated new reactor build may not be seen up to 2025, but the next couple of years will be crucial to secure the future of nuclear power as the world adapts to a post-pandemic environment. It is high time that we must realise the sustainability of nuclear energy vis-à-vis other sources which has been amply proved during the pandemic.

Source: <https://timesofindia.indiatimes.com/blogs/voices/lets-not-ignore-the-resilience-of-nuclear-energy-industry/>, 19 June 2022.

OPINION – Anjani Trivedi

Nuclear is the Future. Tiger and Bill Gates Know It

As energy security becomes a growing source of angst, it's clear that large-scale, reliable use of renewable resources remain a distant reality in many countries. That's allowed a more controversial — and almost perfect — alternative to make a comeback: nuclear. Trouble is, nobody wants a reactor in their backyard and the memories of past accidents remains a serious concern. But with costs rising and few solutions at hand, both governments and companies are turning to nuclear power as a cleaner and cheaper source to help them reach their ambitious climate goals.

Even if a few years away, the development of, and investment in, nuclear energy sources and storage methods could ensure industrial operations highly dependent on pre-heating processes for raw materials and high temperatures are able to function as the world navigates its way through this energy crisis. With all the supply chain snarls over the past year, a power shortage is the last thing consumers and businesses need.

In Japan, the median levelized cost of energy 1 is far lower than utility scale solar and offshore wind. A recent survey showed that more than 80% of Japanese companies are in favor of restarting nuclear reactors to meet power needs. Electric utility Kansai Electric Power Co. is resuming work at one its idled reactors earlier than planned to manage energy demand. Bringing the Mihama No. 3 reactor online will lower need for liquefied natural gas, and the firm's nuclear generation could grow 76% by 2023 as it brings back more reactors....

In India and China, it's proving competitive, too, where dirtier options like coal are now more expensive. South Korea is focused on reviving nuclear power, which contributes to about 27% of the nation's energy mix. Earlier this year, the Biden administration issued a notice of intent for the implementation of a \$6 billion nuclear credit program that supports the operation of reactors — “the nation's largest source of clean power” —

across the country. Last week, the US DOE awarded over \$60 million for 74 nuclear projects. British jet engine maker Rolls-Royce Motor Cars Ltd., backed by the UK government and other investors, said late last year it was going to begin building smaller and cheaper reactors. Some of its compact modular reactors are expected to come online by 2029 and the regulatory processes are already underway.

The return to nuclear makes sense: The cost of extending the lifetime of power plants and building reactors in countries that have stuck by the energy form is cheaper and competitive. Those that haven't are now struggling with their aging fleet of reactors and lack of other sources. The biggest stumbling block, though, is the deep-seated anxieties around safety and waste disposal. Memories of nuclear accidents like Three Mile Island in 1979, Chernobyl in 1986 and Fukushima Daiichi in 2011 continue to loom large in both public and corporate memory. Yet what's often forgotten is that on a deaths-per-unit of electricity basis, nuclear remains at the bottom of the list, while coal is at the top.

The progress that's been made on alleviating issues around nuclear power is underappreciated. For instance, safety in reactors is typically based on an assessment of the core melting. To address these concerns, 14 countries have come up with lower-risk designs and development of a new generation of reactors. These systems will use different coolants, like molten salts or liquid metal, and methods that ultimately make nuclear power production cleaner, secure and more efficient. Reactors that use such materials seek to reduce or cut the production of dangerous gases that explode under pressure.

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Rejecting the power source out of fear isn't going to get us too far, and nor will scare-mongering. Companies and countries shouldn't be shying away from openly discussing nuclear energy and raising awareness. Public acceptance is key. Without it, we'll be breathing dirty air and living through outages.

A host of startups are working on making nuclear power more acceptable. NuScale Power LLC is building small modular reactors that could eventually power 60,000 homes per unit. The firm, which has received more than \$450 million of support from Washington, is working with the US and Romanian governments to build a plant in the eastern European country. Meanwhile, Sweden's Seaborg Technologies has teamed up with Samsung Heavy Industries Co. to build a floating, compact molten salt reactor that could change energy use in logistics. Bill Gates-backed TerraPower — also focused on small reactors — has partnered with South Korea's industrial conglomerate SK Group to build these plants.

Nuclear power stands to be the solution, or at least fill major energy gaps, in the coming years. In addition to the existing nuclear fission used in commercial reactors, startups are now pushing towards nuclear fusion technologies and

have raised billions of dollars from the likes of Tiger Global LP and Bill Gates. Rejecting the power source out of fear isn't going to get us too far, and nor will scare-mongering. Companies and countries shouldn't be shying away from openly discussing nuclear energy and raising awareness. Public acceptance is key. Without it, we'll be breathing dirty air and living through outages.

Source: <https://techai.com/nuclear-is-the-future-tiger-and-bill-gates-know-it/>, 22 June 2022.

OPINION – Jeffrey Lewis, Aaron Stein

Who is Deterring Whom? The Place of Nuclear Weapons in Modern War

In the wake of Russia's invasion of Ukraine, old questions about nuclear deterrence have been revisited by a broad swath of academics, scholars,

and pundits who have spent the past three decades acclimated to a climate of dramatically reduced nuclear risk. For those of us working in what has been a niche subfield, the attention has been both validating and, at times, surprising.

What is not often said is that nuclear deterrence is working and, as a result, both the US and Russia face constraints in how they approach conflict that involves the other. Nuclear deterrence has limited the escalation of the conflict in profound ways, despite brutal fighting, heavy casualties, and the supply of substantial amounts of Western weaponry to Ukraine. This is welcome news, but there is a caution: There is no guarantee that it will continue to do so, nor can there be. The management of escalation means that the US and NATO will have to accept that they too face limits in how to approach the conflict. It would be unwise to hand-wave away Russian nuclear threats, or to dismiss as so many have the Russian threat to use nuclear weapons, based on a warped understanding of deterrence theory.

Nuclear deterrence has contained this conflict in profound ways. The existence of Russian nuclear weapons has thus far deterred the US from directly intervening in the conflict — and this is exactly how this is all supposed to work. The threat of nuclear escalation can be deeply frustrating, especially for many in the US that have never experienced any external limitation on how American military power can be used in support of declared foreign policy goals. Russia has nuclear weapons and, within minutes, can kill millions of people. This reality is far different from the circumstances leading up to the invasion of Iraq or the toppling of Gadhafi.

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The Western weapons that have been so important in blunting Russia's invasion are a perfectly legitimate military target, whether those weapons are in Poland or Ukraine. U.S. officials, however, have drawn a red line against Russian attacks on NATO states — and Russia, to date, has been deterred from striking equipment and supplies on the Polish side of the border.

These constraints have become increasingly frustrating for many advocates of greater American intervention in Ukraine.

For his part, President Biden gets it, and has been clear from the outset of the conflict that he would not place U.S. ground forces in Ukraine. In rejecting a so-called “no-fly zone” over Ukraine that would require direct combat between the forces of both countries he explained, “that’s called World War III, okay? Let’s get it straight here, guys.”

At the same time, American nuclear weapons, as well as those of France and the UK, have deterred Russia from striking lethal arsenals piling up across the border in Poland for delivery into Ukraine. The Western weapons that have been so important in blunting Russia’s invasion are a perfectly legitimate military target, whether those weapons are in Poland or Ukraine. U.S. officials, however, have drawn a red line against Russian attacks on NATO states — and Russia, to date, has been deterred from striking equipment and supplies on the Polish side of the border.

Many observers have expressed frustrations with the constraints imposed by nuclear deterrence, particularly in the US, and have sought to dismiss the role of nuclear weapons to support more aggressive policy suggestions. In one

such example, former commander of U.S. European Command, Gen. (ret.) Breedlove, quipped: We are constantly reacting to Putin. We should be the ones dictating the substance and tempo of this engagement. We are almost fully deterred, while Putin is almost fully undeterred.

Deterrence, by definition, frustrates the objectives of the combatants. And the way in which nuclear

deterrence enforces these limits is through the risk of catastrophic harm. A deterrent relationship is one in which our choices are sharply constrained by existential fear. Nuclear deterrence is supposed to feel awful, because it relies on a cruel assessment of human nature: People respond best of all not to love, joy, or pleasure but to the threat of unyielding pain. "There's a logic to deterrence," the historian Alex Wellerstein has argued, "but it is always coupled, in the end, with raw terror."

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The success, to date, of nuclear deterrence in containing escalation has been obscured by the vocal frustration of those who believed that the existence of U.S. nuclear weapons might somehow have prevented Russia's invasion of Ukraine, despite the fact that the US had no defense obligation (comparable to NATO's Article 5) to come to Kyiv's aid. This seems to reflect a profound misunderstanding of what nuclear deterrence is and how it functions. Nuclear weapons have never provided a blanket protection for all states from conventional violence. The Cold War began with a Soviet-sponsored invasion of South Korea, after all. And there were numerous instances of conflict throughout the Cold War, including cases when states without nuclear weapons attacked those with the bomb. Nuclear deterrence provides no guarantee, merely an incentive in favor of caution. Sometimes a leader may believe that the risk of escalation constrains an opponent more than it does her. In this case, there is the possibility of greater conventional violence beneath the nuclear threshold. Scholars know this problem as the stability-instability paradox, although its root causes aren't paradoxical at all. It is simply down to the confidence and risk tolerance of the combatants.

Nuclear weapons have never provided a blanket protection for all states from conventional violence. The Cold War began with a Soviet-sponsored invasion of South Korea, after all. And there were numerous instances of conflict throughout the Cold War, including cases when states without nuclear weapons attacked those with the bomb. Nuclear deterrence provides no guarantee, merely an incentive in favor of caution.

There is, therefore, no guarantee that deterrence will continue to hold. Indeed, much of the rhetoric among a certain segment of the chattering class indicates an unreasonable level of confidence that escalation to nuclear war is impossible. As Anne Applebaum wrote, "There is no indication right now that the nuclear threats so frequently mentioned by Russian propagandists, going back many years, are real." Eliot Cohen is of the same mindset, writing that it is "Unforgivable — truly unforgivable — if the wealthy and powerful West yields to a much weaker enemy." These analyses share an absolute certitude that Vladimir Putin would never, under any circumstances, initiate the use of nuclear weapons, or that, if he would, this decision would have nothing to do with his perception of his adversaries' actions. We find such certitude baffling.

It is, of course, true that both Russian and American officials manipulate risk, and that both have powerful interests in avoiding a nuclear war. But that does not mean the risk is a figment of our imaginations. Our reading of most nuclear crises from the Cold War is that, while both Washington and Moscow sought to avoid the use of nuclear

weapons, there were always opportunities — by misperception, accident, or simply chance — for the nuclear powers to stumble into a nuclear war neither side wanted. Many officials in the Kennedy administration were confident that Soviet leader Khrushchev would seek to avoid nuclear war under any circumstances, even if the US were to invade Cuba. They were also certain that there were no Soviet nuclear weapons in Cuba. On the latter point, they were wrong. These kinds of historical near-misses may send a shiver down one's spine, but that is precisely the point.

Without the risk that something might go horribly wrong, nuclear deterrence would cease to function. For a world leader to feel the pinch of nuclear deterrence restraining her, she must believe that at some point things might go catastrophically wrong.

Schelling argued that analysts were mistaken to talk of the brink of nuclear war as if it were the “sharp edge of a cliff where one can stand firmly, look down, and decide whether or not to plunge.” A better description, he argued, was a “curved slope.” A leader might edge his or her country out onto this slope, but “the slope and the risk of slipping are rather irregular; neither the person standing there nor the onlookers can be quite sure quite how great the risk is, or how much it increases when one takes a few steps downward.”

The irreducible risk that things might go terribly wrong is necessary for nuclear deterrence to function and has held up well in this conflict. It is a feature, not a bug. And so, we want to say clearly that nuclear deterrence has worked during this conflict — it has deterred direct conflict between two great powers when each has powerful reasons to escalate.

The US and Russia have edged, ever so carefully, out onto this slope. The Biden administration, for example, carefully weighed the risks of providing rocket systems to Ukraine that can strike targets on the Russian side of the border before deciding, correctly in the authors’ view, that such systems should be provided. This step seems safe enough. But we should acknowledge that we do not really know and that there remains a risk of slipping. Tread carefully....

In the face of uncertainty, leaders can try to infer what the other might be thinking. One way to do this is to listen to what an opponent says. It is tempting to dismiss statements by our adversaries and their red lines as cynical efforts to manipulate our fear of escalation for their political gain. There is, of course, some of that in their rhetoric, and in ours. And yet they do have red lines, as do we. Knowing where the slope becomes too steep is a very interesting game of chance. The fact that this is difficult, frustrating, and ultimately terrifying does not mean that nuclear deterrence is failing. Anticipating the Russian reaction to each increase in the lethal support given to Ukraine is not “self-deterrence.”

It is simply deterrence.

On the contrary, the irreducible risk that things might go terribly wrong is necessary for nuclear deterrence to function and has held up well in this conflict. It is a feature, not a bug. And so, we want to say clearly that nuclear deterrence has worked during this conflict — it has deterred direct conflict between two great powers when each has powerful reasons to escalate. We accept that it does not feel successful, because successful nuclear deterrence is both frustrating and terrifying. It is frustrating because it limits our freedom of action, as it limits theirs, and terrifying, because it could all fail unpredictably and catastrophically. This is not an accident. It is a mechanism by which the balance of terror functions and this basic reality cannot be wished away, or simply dismissed to support

policies that intentionally dismiss what are very real threats to using nuclear weapons. Russia has the means to use these weapons and has explained how they could choose to use them. No human knows how — in that moment — a leader will respond. The goal of deterrence is to never get to that moment of choice and, at least thus far in this war, the two sides have managed to do just that.

Source: <https://warontherocks.com/2022/06/who-is-detering-whom-the-place-of-nuclear-weapons-in-modern-war/>, 16 June 2022.

OPINION – Paul Poast

Fears of a Nuclear-Armed Iran Might be Overblown

Reports that Iran is nearing the point where it could conceivably develop a nuclear weapon are once again causing widespread alarm. The latest information suggests that Iran’s stockpile of enriched uranium, if significantly further enriched, is more than enough to provide the weapons-grade fissile material needed for a bomb. That

alone wouldn't be enough to build—or deliver—a working bomb, but it does put Tehran closer than ever to equipping one.

The news comes as multilateral talks in Vienna to revive the 2015 Iran nuclear deal—known formally as JCPOA—have stalled. Iran could return to the negotiating table at the 11th hour, agreeing to return to compliance with the deal, from which the Trump administration unilaterally withdrew in 2018, in exchange for sanctions relief and a

normalization of relations with the West. But this seems increasingly unlikely, meaning Iran will once again be poised for a “nuclear breakout” scenario, by which it could slowly accumulate the necessary components for a bomb under the guise of a civilian nuclear program, and then assemble them into a nuclear weapon faster than efforts to stop it can be mobilized.

Even short of Iran possessing a nuclear bomb, this prospect is viewed as alarming because, as Eric Brewer wrote recently in *Foreign Affairs*, “Iranian foreign policy would grow bolder and more aggressive if Tehran believes it can hang the nuclear breakout sword of Damocles over the head of the international community.” Armed with a bomb, Tehran could be even more reckless.

For instance, Israel and Saudi Arabia, long-time rivals of Iran and partners of the US, fear that Iran would escalate and heighten its support for groups with which they are in conflict, including Hezbollah in Lebanon and the Houthis in Yemen, respectively. Moreover, Iran gaining the bomb could spur other countries in the region, fearful

of Tehran's intentions, to develop their own nuclear weapons. The global nuclear nonproliferation regime in place since 1970, already strained, would be left in shambles.

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Amid this debate, however, it's worth considering whether the fears of a nuclear-armed Iran might be overblown. The arguments against Iran acquiring a nuclear weapon presume that having the bomb would embolden the regime and bolster its ability to destabilize the region. But what if that's not the case.

Consider the issue from the perspective of the US, which has been a key player in efforts to prevent Iran from acquiring the bomb since Tehran's uranium enrichment program came to light in 2003. Preventing Iran from acquiring a nuclear weapon is one of the few policy issues with bipartisan support in Washington. Democrats and Republicans

disagree on the best means of doing so—Democrats, through the negotiation of the JCPOA, opted for a diplomatic approach; while Republicans, through the imposition of sanctions and the threat of military force, have resorted to “maximum pressure.” But the partisan debate is over means, not ends. If Iran succeeds in developing a nuclear weapon, it will be a bipartisan failure.

Amid this debate, however, it's worth considering whether the fears of a nuclear-armed Iran might be overblown. The arguments against Iran acquiring a nuclear weapon presume

that having the bomb would embolden the regime and bolster its ability to destabilize the region. But what if that's not the case? In fact, it's unlikely that any of the worst-case scenarios would actually unfold if Iran acquired a bomb, as becomes clear by reconsidering three key reasons behind the U.S. opposition to Iran going nuclear.

First, the U.S. has long-standing “special relationships” with both Israel and Saudi Arabia as key allies in the region—indeed, U.S. President Biden is expected to visit both countries in July 2022. And as mentioned above, both Israel and

Saudi Arabia are rivals of Iran and oppose it acquiring a nuclear weapon because they fear it might empower and embolden Tehran. Those fears have in turn informed and shaped the U.S. perception of the dangers of Iran acquiring the bomb. But it's also possible that Iran is simply seeking to alter a military balance in the region that favors those two countries. After all, Israel already possesses a nuclear arsenal. For its part, Saudi Arabia does not possess the bomb and does not fall under the US' "nuclear umbrella." But the pursuit of a bomb by Saudi Arabia is a real possibility. And in the meantime, the Saudis benefit from their security partnership with the U.S. In other words, what Israel and Saudi Arabia perceive as an aggressive move could in fact be a defensive one.

Second, there is the perpetual fear over the use of nuclear weapons. The more countries that possess the bomb, the greater the possibility they will be used. But if Iran possessed the bomb, would it actually use one to achieve goals such as to "wipe Israel off the face of the earth," as former Iranian President Ahmadinejad once threatened to do? It might be the case that Iran is somehow impervious to the Nuclear Taboo, the widespread norm shared even by nuclear weapons states that using the bomb, even just once, is morally reprehensible. It might also be the case that possessing a nuclear weapon will facilitate Iran's attempts to expand its regional influence. But historically Iran has sought to expand its influence by exporting its revolution to other states, generally through subnational actors like Hezbollah and Yemen. Dropping a nuclear weapon into the very areas it hopes to expand its influence would not be very logical.

Third, there is the concern over nuclear blackmail. Even if a country has no intention of using the

historically Iran has sought to expand its influence by exporting its revolution to other states, generally through subnational actors like Hezbollah and Yemen. Dropping a nuclear weapon into the very areas it hopes to expand its influence would not be very logical.

Iran's pursuit of a nuclear weapon seems consistent with the notion of "status seeking." The political scientist Lilach Gilady, in examining how states seek to acquire "prestige," argued that nuclear weapons can be a key part of that pursuit.

bomb, it is in a position to make maximalist demands of its adversaries, because no leader would want to run the risk of nuclear use by opposing those demands. This logic underpins the Biden administration's care in avoiding direct military confrontation with Russia in Ukraine. But according to an in-depth RAND report by Alireza Nader from 2013, at the time the JCPOA was being negotiated, a nuclear-armed Iran is unlikely to use a bomb "against another Muslim state or against Israel, given the latter's overwhelming conventional and nuclear military superiority."

If concerns over Iran's pursuit of a nuclear bomb are exaggerated and Iran is not, in actuality, motivated by military competition or bargaining coercion, then why is it pursuing a bomb—or at least the technical capabilities that would allow it develop one?

Iran's pursuit of a nuclear weapon seems consistent with the notion of "status seeking." The political scientist Lilach Gilady, in examining how states seek to acquire "prestige," argued that nuclear weapons can be a key part of that pursuit. "Landing on the moon, finally decoding the human genome, a successful nuclear test: all these provide threshold moments that are bound to attract international attention," Gilady wrote. Iran's leadership appears to have a psychological need to experience its own prestige moment.

But acquiring the bomb is about more than seeking prestige for its own sake. It would allow Iran's government to validate the 1979 revolution that established the Islamic Republic as a theocracy. Iran has been largely viewed as an international pariah—or, to use the term favored during most of the post-Cold War era, a "rogue state"—since Shah Reza Pahlavi was overthrown and Khomeini

came to power. Developing a nuclear bomb could be seen by Iran's current rulers as exemplifying the grandeur of its model of government. In showing that Iran can develop the "ultimate weapon" on its own, acquiring the bomb would demonstrate the superiority of Iran's theocratic governance system over that of Saudi Arabia, for instance, a key competitor seen as highly dependent on the US.

If status and prestige are ultimately the goals of Iran's pursuit of the bomb, then the worst-case scenarios associated with Iran acquiring nuclear weapons are exaggerated. Moreover, the U.S. interest in achieving a bipartisan goal, appeasing regional allies and supporting the nonproliferation regime, while understandable, may be chimerical. This is not to say that the spread of nuclear weapons should be encouraged. But it suggests that if a state like Iran is bound and determined to pursue a bomb, even in the face of economically crushing sanctions, then it's worth asking why it's so important to stop them. It might be better to let them have it and then learn to live with it.

Source: <https://www.worldpoliticsreview.com/articles/30634/fears-of-a-nuclear-iran-jcpoa-or-not-might-be-overblown>, 24 June 2022.

OPINION – Kelsey Davenport

The Nonproliferation Consequences of Biden's Inaction on the Iran Nuclear Deal

Iran is closer to a nuclear weapon than at any point in its history. Tehran can now produce enough weapons-grade uranium for a bomb in less than 10 days—a timeframe so short that international inspectors may not detect such a "breakout" move. Building a bomb would take another 1-2 years, but once the nuclear material

is moved to covert facilities for weaponization, detecting and disrupting those processes would be much more challenging. Despite the seriousness of this proliferation threat, prospects for a diplomatic resolution are waning as the Biden administration appears unwilling to make the difficult decisions necessary to resolve this crisis.

The swiftest, most effective way to quell the escalating proliferation risk and verifiably limit Iran's program is to restore the 2015 nuclear deal, known as the JCPOA. That deal resolved a decades-long crisis spurred by Iran's illicit attempt to build nuclear weapons prior to 2003, and proved to be an effective bulwark against any future moves to a bomb—until U.S. President Trump withdrew from the accord in May 2018 and embarked on a "pressure campaign" ostensibly designed to push Iran into new negotiations. Predictably, following the U.S. reimposition of nuclear-related sanctions (and others), Tehran

responded by building up its nuclear program in violation of the JCPOA's limits to gain its own leverage.

Both U.S. President Biden and Iranian President Raisi profess to support a return to compliance with the

JCPOA, but the gridlock in negotiations raises doubts about their political will to make the concessions needed to restore the accord. Indirect negotiations between Washington and Tehran over the past year have produced a draft agreement outlining steps to return both countries to compliance with their JCPOA obligations. Unfortunately, talks stalled within sight of the finish line over a symbolic non-nuclear issue: a Trump-era sanction designating the IRGC as a foreign terrorist organization (FTO).

Iran views lifting the designation as politically

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Iran is closer to a nuclear weapon than at any point in its history. Tehran can now produce enough weapons-grade uranium for a bomb in less than 10 days—a timeframe so short that international inspectors may not detect such a "breakout" move.

significant and a necessary step to reverse Trump's pressure campaign. The Biden administration, however, has drawn a line at removing the designation without assurance from Iran that the IRGC will take steps to reduce tensions in the region. That the FTO designation is symbolic, gives Biden no additional tools for countering the IRGC, and was put in place by the Trump administration to make a return to the JCPOA more difficult, do not appear to have swayed Biden's calculus.

Statements from Tehran suggest Iran's position on this issue might be softening. But rather than returning to the drawing board to come up with new, creative ideas to address this impasse, Washington continues to put the onus on Tehran to drop what the Biden administration views as extraneous demands and accept the draft agreement on the table that would restore the JCPOA. But while Biden waits for Tehran to blink, Iran's expanding nuclear program is eroding the nonproliferation benefits of the deal. Biden may pay a political price for modifying sanctions on the IRGC, but it pales in comparison to the price he will pay if talks to restore the JCPOA collapse and Iran moves even closer to a bomb.

Growing Nuclear Risk: While Iran's initial breaches of the JCPOA were carefully calibrated to build pressure without complicating a restoration of the accord, its violations over the past 18 months pose a much more serious proliferation risk and are more difficult, if not impossible, to reverse. Iran is now enriching uranium to 60 percent, a level dangerously close to weapons grade, and has produced enough material enriched to that level that Tehran could

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Iran is now enriching uranium to 60 percent, a level dangerously close to weapons grade, and has produced enough material enriched to that level that Tehran could use the 60 percent stockpile to produce enough weapons grade uranium for a bomb—about 25 kilograms of uranium enriched to 90 percent—in a matter of days.

use the 60 percent stockpile to produce enough weapons grade uranium for a bomb—about 25 kilograms of uranium enriched to 90 percent—in a matter of days. When the JCPOA was fully implemented, that timeframe, known as breakout, was 12 months, more than enough time to mount an effective response.

That short timeframe is even more dangerous because Iran reduced IAEA access (which had been guaranteed under the JCPOA) to key nuclear facilities in 2021, meaning that Tehran could try to produce enough the fissile material for a bomb between inspections. But even if Iran's move to weapons grade uranium were detected, there may not be time to respond before Tehran moves the fissile material to a covert facility to begin the 1–2-year weaponization process or to detect where those activities are taking place. The US may tolerate this risk in the short term while prospects for a deal remain on the table, but as a long-term prospect this threat will be destabilizing and increase the risk that the US—or more likely Israel—resort to military action to put time back on the breakout clock.

Irreversible knowledge gains also put the future of the accord at risk. Iran's enrichment of uranium to 60 percent—a level it had not achieved prior to the JCPOA capping enrichment at 3.67 percent—as well as its operation of more efficient and advanced centrifuges and experiments with uranium metal, a key activity in weaponization, change how quickly Iran could move to a bomb if a decision were made to do so and the route it would choose. All of these activities were tightly capped or outright prohibited under the JCPOA, and Iran was complying with all of those commitments before Trump's withdrawal. But now, if Iran masters the latter capabilities and expands

into new areas of research, a restored JCPOA may not be able to reliably block these alternative pathways to nuclear weapons.

In addition to increasing the risk that Iran could “breakout” and achieve enough fissile material for a nuclear weapon before being detected, Tehran’s attempt to build leverage in the negotiations by reducing transparency complicates the IAEA’s ability to verify a restored JCPOA. Iran’s nuclear program is now subject to the bare minimum of international inspections, after having reduced IAEA access in February 2021 and announced on June 9 that it was disconnecting IAEA cameras collecting data that would be handed over to the agency if the JCPOA is restored.... Even if Iran takes no new action to advance its program, the nuclear crisis still will intensify as time compounds these existing challenges: the breakout timeline will decrease further, Iran will gain more knowledge that cannot be reversed, and reconstructing a record of Iran’s nuclear activities will be more difficult....

Even if Iran takes no new action to advance its program, the nuclear crisis still will intensify as time compounds these existing challenges: the breakout timeline will decrease further, Iran will gain more knowledge that cannot be reversed, and reconstructing a record of Iran’s nuclear activities will be more difficult.

There Is No Good Plan B: The Biden administration is already signaling that if talks to restore the JCPOA fail, it will turn to the typical U.S. playbook for countering proliferation—a combination of sanctions pressure and diplomatic isolation paired with an open door to negotiate an off-ramp and the threat of military action should such efforts fail. The Obama administration and its partners successfully utilized this strategy to build global support for the sanctions that influenced Iran’s decision to negotiate. But 2022 is not 2013. The US cannot expect the same level of international support this time around—particularly given that the Trump administration instigated this crisis by withdrawing from the JCPOA when Iran was complying with its obligations. That move, which diminished U.S. credibility, combined with the rift between the West and Russia over Moscow’s invasion of Ukraine and frustration with U.S. sanctions overreach, all suggest that Washington would be hard pressed to build an effective international campaign to sanction and isolate

Iran.

The same is not true of Iran, which will be in a stronger position than it was when JCPOA negotiations commenced in earnest in 2013. If Tehran judges that talks are in its interest, it will come to the table with new nuclear capabilities, a larger program that it can leverage for further concessions. Iran’s oil and gas reserves will also become increasingly attractive as the energy crisis deepens, further strengthening Iran’s hand. This suggests that any future deal will be more favorable to Iran than the JCPOA.

Building pressure is also a time-consuming process, increasing the risk that spoilers or deliberate provocations prevent diplomacy or drive an escalatory tit-for-tat spiral toward conflict. There are multiple flashpoints that could trigger a cycle of escalation, including Israel’s continued campaign of sabotaging Iranian nuclear facilities, assassinating scientists affiliated with Tehran’s nuclear program, and conducting sustained cyber-attacks. It is highly likely that Israel, or even the US, will ramp up covert efforts to roll back Iran’s nuclear program should talk fail....

But if past is prologue, kinetic action will only buy time in the short term and, in the long term, spur Iran’s nuclear activities to new levels and result in Tehran hardening its facilities against future attacks. For instance, after the Natanz uranium enrichment facility was sabotaged in April 2021, Iran announced it would begin enrichment to 60 percent. After Iranian scientist and the so-called father of Iran’s pre-2003 organized nuclear weapons program, Fakrizadeh, was assassinated in November 2020, Tehran responded by passing a law that accelerated its enrichment program and reduced IAEA monitoring.

The best of all of the bad plan B options would be to try for an interim deal, or have Washington and Tehran agree to a series of steps that would reduce tensions and buy time to restore the JCPOA or negotiate a new agreement. While this is the “best” plan B option, it still stands a poor chance

of succeeding. The EU, which has served as an interlocutor between Washington and Tehran during the past year of talks, pursued an interim agreement early in the negotiations before giving it up as too time consuming and complicated.

Pursing that strategy now would likely face the same challenges—both Washington and Iran will seek significant concessions from the other side while trying to retain their most significant sources of leverage. On the U.S. side, Congress also will want to review any deal, even an interim accord, under the Iran Nuclear Agreement Review Act, and could block Biden's ability to waive sanctions if a resolution disapproving the agreement is passed by both Chambers. An interim deal that buys time for negotiations without the promise of restoring the JCPOA, or reaching a new comprehensive agreement, may be a hard sell in Congress. Despite these significant challenges, an interim deal still is preferable to the inevitable escalation that would occur as a result of pursuing other plan B options.

Restoring the JCPOA is the Best and Only Good Choice: The increasingly serious proliferation risks posed by Iran's expanding nuclear program and the futility of the plan Bs underscore the imperative of seizing the moment to restore the JCPOA now, before Iran's nuclear advances and a growing monitoring gap significantly reduce the nonproliferation benefits of the accord. If President Biden is unwilling to bite the bullet and delist the IRGC (which it should reconsider), it behooves his administration to find another, creative way to get to yes on a deal to restore the JCPOA. A serious new proposal might spur Iran to refrain from further nuclear provocations and preserve space for the accord and send a signal that Tehran

remains serious about restoring the nuclear deal. But if Biden fails to act, he will share the responsibility alongside Trump for allowing Iran to become a nuclear power.

Source: <https://www.justsecurity.org/82038/the-nonproliferation-consequences-of-bidens-inaction-on-the-iran-nuclear-deal/>, 23 June 2022.

OPINION – Alexander Schallenberg, Phil Twyford

The New Urgency for Progress Toward Nuclear Disarmament

The best of all of the bad plan B options would be to try for an interim deal, or have Washington and Tehran agree to a series of steps that would reduce tensions and buy time to restore the JCPOA or negotiate a new agreement. While this is the "best" plan B option, it still stands a poor chance of succeeding.

Austria and New Zealand may be far apart geographically but we are connected by shared values and principles. Particularly relevant today is our longstanding opposition to nuclear weapons and our shared concern about the lack of progress on nuclear disarmament. While the

threat of nuclear weapons never went away after the end of the Cold War, steep cuts to nuclear stockpiles in the early 1990s represented progress. But the trend toward disarmament stalled. Three decades on, nine nuclear-armed states possess some 13,000 nuclear warheads and, far from phasing out their arsenals, these states are modernizing and expanding them.

The increasingly serious proliferation risks posed by Iran's expanding nuclear program and the futility of the plan Bs underscore the imperative of seizing the moment to restore the JCPOA now, before Iran's nuclear advances and a growing monitoring gap significantly reduce the nonproliferation benefits of the accord.

The risks of nuclear escalation, miscalculation and accident are mounting, even though we have a better understanding than ever of the catastrophic consequences that would follow from the use of nuclear weapons.

We recently received a fresh wake-up call. In early January, the five nuclear powers on the UNSC reaffirmed the 1985 statement by US President Reagan and Soviet President Gorbachev that "a nuclear war cannot be won and must never be fought." Yet, the following month, Russian President Putin's regime threatened to unleash those same, vastly destructive and

indiscriminate weapons in the context of Russia's war of aggression against Ukraine. This threat — which we unequivocally condemn — has sparked a new global debate on the value of nuclear deterrence, highlighting a bleak dissonance between the avowed collective goal of achieving a world without nuclear weapons, and the ongoing reliance on them in nuclear-armed states.

This dissonance is also evident in the NPT, which entered into force more than 50 years ago following a "grand bargain" between nuclear-armed China, France, Russia, the UK and the US, and non-nuclear-armed states, including Austria and New Zealand. The NPT's signatories acknowledged that nuclear disarmament is ultimately the most effective way to discourage proliferation. But while proliferation risks have increased in recent decades, concrete progress has stalled. Sixty years after the Cuban missile crisis brought the world to the brink of catastrophe, we find ourselves again faced with the threat of nuclear escalation.

Countries the size of New Zealand and Austria cannot coerce others to heed our wishes. But we are far from powerless when it comes to encouraging constructive change, especially when we work together with like-minded partners. In July 2017, we were among more than 120 states that adopted the new TPNW. The TPNW crystallizes our total opposition to nuclear weapons. Consistent with the NPT, it is a practical manifestation of our commitment to nuclear disarmament. And it is based on evidence, both of the catastrophic consequences of the use of nuclear weapons and of the risks associated with nuclear deterrence. The new treaty asks tough questions of those with nuclear decision-making authority. It is they who must consider the

sustainability of an approach to national security that imposes existential risks on their populations, as well as all other states and, indeed, the rest of humanity.

The treaty [TPNW] also gives voice to the majority of states that do not accept nuclear deterrence as a valid basis for security. We are convinced that it is a fundamental error to believe that these weapons provide security. In reality, they pose a profound threat to us all, as well as to future generations. The TPNW is also a means of focusing public debate and channelling resources

toward those affected by the use of nuclear weapons, not least the Pacific communities that have been exposed to nuclear testing. The TPNW's evidence-based focus on the humanitarian consequences and existential risks of nuclear weapons gives it immense transformational potential.

From June 21-23 in Vienna, Austria will host the first meeting of parties to the TPNW. Even as we acknowledge that there is much work to be done, we should understand that this meeting is a major achievement in itself. It shows what can be accomplished by a strong alliance between like-minded states and civil society. Similar alliances were instrumental in banning anti-personnel mines and cluster munitions. Moreover,

several nuclear-allied states and other non-state parties have indicated that they will attend the meeting as observers. We welcome them. Even if our views differ on the validity of nuclear weapons for security, we value the perspectives they will bring to an international conversation about the consequences, risks and challenges of nuclear weapons. This conversation is essential, especially now that nuclear risks are higher than they have been in decades.

The TPNW is not a quick fix. But it can build

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The TPNW is not a quick fix. But it can build international pressure and help to put the world back on track toward nuclear disarmament. Given the fundamental threat to humanity, we cannot be content with the status quo on nuclear disarmament.

international pressure and help to put the world back on track toward nuclear disarmament. Given the fundamental threat to humanity, we cannot be content with the status quo on nuclear disarmament. Austria and New Zealand will continue to spearhead these efforts. In the interests of humanity, we will continue to work with all willing state and civil society partners to remove the nuclear sword of Damocles that is hanging over all our heads.

Source: <https://www.arabnews.com/node/2110731>, 25 June 2022.

NUCLEAR STRATEGY

AUSTRALIA

Australia Talks Down Prospect of Having Nuclear Subs by 2030

Australia's new defense minister on 29 June talked down the prospect of Australia acquiring U.S. nuclear-powered submarines by the end of the decade, describing such a timetable as "optimistic in the extreme."

Defense minister Richard Marles, whose party came to power at elections last month, said his priority was closing a naval capability gap that is expected to open when Australia's aging fleet of six Collins-class diesel-electric submarines begins to retire from 2038. The US and Britain have agreed to provide Australia with a fleet of submarines powered by U.S. nuclear technology. But when the agreement was announced in September, the first submarine was not expected to be delivered until 2040. Former Defense Minister Peter Dutton said this month that the United States could be persuaded to provide Australia with two Virginia-class submarines from its Connecticut production line by 2030. Marles, who is acting prime minister while Anthony Albanese is overseas, doubted Australia would have a single nuclear-powered submarine by 2030. ...

Dutton, who is now opposition leader, said China would have the technology to detect Collins-class submarines in the South China Sea by 2035. Unlike nuclear submarines, diesel-electric submarines have to surface and run on diesel-propulsion while they recharge their batteries. China is developing technology that would detect submarines on the surface, Dutton said. ... Australia's new Foreign

Minister Penny Wong is visiting her birth country Malaysia to allay fears that the Australian move to nuclear propulsion could spark a regional arms race. She said that her government was committed to ensuring the region remained peaceful, stable and prosperous.

Source: <https://timesofindia.indiatimes.com/world/rest-of-world/australia-talks-down-prospect-of-having-nuclear-subs-by-2030/articleshow/92532851.cms>, 29 June 2022.

JAPAN

Kishida Cautious about Japan Acquiring Nuclear-Powered Subs

Japanese PM Kishida on June 19 took a cautious view about acquiring a nuclear-powered submarine to boost the country's defense capability, a call made by some opposition parties ahead of next month's upper house election. "I'm not so sure if making the leap to a nuclear submarine is a good idea," Kishida said in an appearance on a Fuji TV program with other party leaders. He cited the difficulty of using nuclear power for military purposes under Japan's atomic energy law and the high running cost.

But Kishida, who heads the ruling Liberal Democratic Party, stressed the need to reinforce Japan's defenses at a time when Russia's invasion of Ukraine and Chinese military assertiveness have highlighted Japan's security challenges. "We will see what needs to be prioritized to safeguard the people's lives and their livelihoods," he said.

Ichiro Matsui, leader of the Japan Innovation Party, and Yuichiro Tamaki, head of the Democratic Party for the People, called for acquisition of a nuclear-powered submarine to boost deterrence and reconnaissance capacity. Japan "should have an advanced type (of submarine) to increase deterrence," Matsui said, while Tamaki stressed the advantage of a nuclear submarine's ability to stay underwater for months for enhanced surveillance and reconnaissance operations....

Source: <https://asia.nikkei.com/Politics/International-relations/Indo-Pacific/Kishida-cautious-about-Japan-acquiring-nuclear-powered-subs>, 19 June 2022.

NORTH KOREA

N. Korea Talks of New Army Duties Suggest Nuclear Deployment

North Korea discussed assigning additional duties to front-line army units at a key military meeting... a move that analysts said indicates it plans to deploy battlefield nuclear weapons targeting South Korea along the rivals' tense border. While much international attention has focused on North Korea's testing of intercontinental ballistic missiles potentially capable of reaching the U.S. mainland, it is also developing a variety of nuclear-capable short-range missiles that can target South Korea. South Korean officials recently said that North Korea has completed preparations for its first test of a nuclear explosive device in five years, part of a possible effort to build warheads capable of being mounted on short-range missiles.

During an ongoing meeting of the Central Military Commission of North Korea's ruling Workers' Party, leader Kim and other top military officers discussed on June 22 "the work of additionally confirming the operation duties of the front-line units of the Korean People's Army and modifying the operation plans" ... Kim also ordered steps to "enhance the operational capabilities of the front-line units". A KCNA photo showed what appeared to be a large map of the Korean Peninsula's eastern coast, including border sites, standing near the conference table.

A KCNA report on April 17 on the test-launch of what it called a new type of tactical guided weapon said it has "great significance in drastically improving the firepower of the front-line long-range artillery units, enhancing the efficiency in the operation of (North Korea's) tactical nukes and diversification of their firepower missions." Later in April, Kim said North Korea could preemptively use nuclear weapons if threatened, saying they would "never be confined

to the single mission of war deterrent" in situations in which the country faces external threats to its "fundamental interests." The possibility of North Korea having an escalatory

nuclear doctrine could pose greater concern for South Korea, Japan and the US.

North Korea has described some of its other short-range nuclear-capable missiles tested in recent years as tactical weapons, which experts say communicates a threat to

proactively use them during conventional warfare to blunt the stronger conventional forces of South Korea and the US.... Kim convened the Central Military Commission meeting earlier this week to confirm "crucial and urgent tasks" to expand the country's military capabilities and implement key defense policies, state media said....

This year, North Korea has test-launched about 30 missiles in what some experts call an attempt to expand its arsenal and increase its leverage in future negotiations with the US to win sanctions relief and other concessions. The weapons tested include an ICBM. Analysts say North Korea needs to master missile reentry capabilities and other technologies to make a functioning long-range weapon. There have been signs of an impending

North Korean nuclear test for weeks. South Korean officials said the test has been delayed by North Korea's continuing COVID-19 outbreak and opposition from China, its last major ally and biggest aid provider.

South Korean and U.S. officials have warned North Korea that it will face consequences if it goes ahead with a nuclear test. But divisions between the permanent members of the UNSC make prospects for additional international sanctions on North Korea unclear. Earlier in May 2022, Russia and China vetoed U.S.-sponsored resolutions that would have increased sanctions, insisting that Washington should focus on reviving dialogue.

Source: <https://apnews.com/article/politics->

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south-korea-nuclear-weapons-north, 23 June 2022.

RUSSIA

Russia Tries to Impress West by Publishing Satellite Photos of Nuclear War Targets

Russia's space agency published the coordinates of Western defence headquarters including the US Pentagon and the venue of NATO's summit on 28 June, saying Western satellite operators were working for Russia's enemy – Ukraine. Dmitry Rogozin, head of Roscosmos, told the Russian RIA Novosti news agency: "The entire conglomerate of private and state orbital groupings is now working exclusively for our enemy."

Members of the US-led NATO alliance make no secret of the fact that they are sending weapons to help Ukraine resist Russia's invasion. The US satellite imagery company Maxar, whose clients include the US Defense Department, has several times published pictures it has taken over Ukraine and Russia since before the invasion began in February. They included images of Russia's military build-up near Ukraine, at a time when it was denying any intention to invade.

... "Roscosmos publishes satellite photographs of the summit venue and the very 'decision centres' that support Ukrainian nationalists." The posting included Russian satellite pictures of the summit venue in Madrid, the Pentagon, the White House in Washington, British government buildings in central London, the German Chancellery and Reichstag parliament building in Berlin, NATO headquarters in Brussels, and the French president's residence and other government buildings in Paris. ...

Source: <https://www.euractiv.com/section/global/>

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europa/news/russia-tries-to-impress-west-by-publishing-satellite-photos-of-nuclear-war-targets/, 28 June 2022.

USA

House Authorizers Approve \$45M to Keep Sea-Launched Nuke on Life Support

The House Armed Services Committee approved a proposal to keep

development going on a low-yield nuclear cruise missile that was cancelled in the Biden administration's fiscal 2023 budget request. The amendment authorizes the addition of \$45 million in funds for the Navy's SLCM-N program. Rep. Cooper, D-Tenn., who leads HASC's strategic forces subcommittee, offered the proposal today as the committee marked up the FY23 NDAA.

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The Biden administration had hoped to stop further development of SLCM-N after completing its NPR, which wrapped up earlier this year. The department has yet to publish an unclassified version of the review, but several of the Pentagon's top brass — including Chairman of the Joint Chiefs of Staff Gen.

Milley and US Strategic Command head Adm. Richard, among others — have raised objections to SLCM's cancellation.

Cooper characterized his amendment as a prudent middle ground, allotting the program a small amount funding (at least by Pentagon standards), while not pouring in enough money that development of the new weapon is a foregone conclusion.

The Senate Armed Services Committee authorized \$25 million to continue development of SLCM-N in its own version of the NDAA, which it passed through committee last week. Once both chambers approve their defense policy bills, HASC

and SASC members will enter conference discussions, where they hammer out differences in the proposed legislation. However, the congressional appropriations committees — which have the power to actually obligate funding to the US government — will ultimately decide whether the SLCM program is cancelled. The House Appropriations Committee, which marks up its version of the defense spending bill on June 22, chose not to delegate funding to SLCM-N.

Source: <https://breakingdefense.com/2022/06/house-authorizers-approve-45m-to-keep-sea-launched-uke-on-life-support/>, 22 June 2022.

The land-based mid-course missile was tested within China's borders and "achieved its objective", the Ministry of National Defence said in a brief statement. It said the missile test was defensive in nature and not aimed at any country. It is China's sixth publicly announced land-based anti-ballistic missile test since 2010.

BALLISTIC MISSILE DEFENCE

CHINA

China Says Latest Anti-Ballistic Missile Test 'Achieved Objective'

China carried out a successful anti-ballistic missile test on June 19, its defence ministry said, a year after the last one. The land-based mid-course missile was tested within China's borders and "achieved its objective", the Ministry of National Defence said in a brief

statement. It said the missile test was defensive in nature and not aimed at any country. It is China's sixth publicly announced land-based anti-ballistic missile test since 2010. The last such missile interceptor test was in February 2021.

...The test was announced as China's nuclear build-up has been in the spotlight. Defence Minister Fenghe told a regional security summit earlier in June that the country had made "impressive progress" in developing new nuclear weapons, which he said were useful to prevent a war.

China became only the second country after the US to intercept a ballistic missile with a kinetic kill vehicle in the first such test in 2010 The US Ground-based Midcourse Defence system was deployed in 2004 and is designed to protect the country from a limited long-range ballistic missile attack. Once the Chinese technology is fully developed, it could change the balance of nuclear deterrence.

June 19 test was carried out in the mid-course phase, when the missile travels outside the atmosphere – as was the case in all previous tests except for one in 2014. The ministry did not give further information, including on the location,

type of system being tested or the missile being intercepted. China became only the second country after the US to intercept a ballistic missile with a kinetic kill vehicle in the first such test in 2010 The US Ground-based Midcourse Defence system was deployed in 2004 and is designed to

protect the country from a limited long-range ballistic missile attack. Once the Chinese technology is fully developed, it could change the balance of nuclear deterrence. The aim is to knock out incoming ICBMs outside the Earth's atmosphere, reducing collateral damage to ground targets. But they are challenging to

intercept during the mid-course stage, when the missile travels well outside the atmosphere at a high velocity, and a high degree of precision is required.... Missiles can also be intercepted during the boost phase, minutes after it is launched, and during the re-entry or terminal phase when it re-enters the atmosphere towards its target....

Source: <https://www.scmp.com/news/china/military/article/3182407/china-says-latest-anti-ballistic-missile-test>, 20 June 2022.

EMERGING TECHNOLOGIES AND DETERRENCE

USA

Raytheon, Northrop Advance in Competition to Develop Hypersonic Weapons Interceptor

Raytheon Technologies and Northrop Grumman have each won contracts to continue developing hypersonic weapons interceptors in a Missile

Defense Agency-led competition, according to a June 24 Pentagon contract announcement. Each company was awarded a firm-fixed price modification to a previously awarded contract for rapid prototyping. Each modification is worth roughly \$41.5 million, bringing the total contract value thus far to around \$61 million each....

In November 2021, the MDA chose the two companies along with Lockheed Martin to design the Glide Phase Interceptor (GPI) for regional hypersonic missile defense. Through other transactional agreements, the companies entered an "accelerated concept design" phase. The interceptors are intended to counter a hypersonic weapon during its glide phase of flight, a challenge as the missiles can travel more than five times the speed of sound and can maneuver, making it hard to predict a missile's trajectory. The interceptors will be designed to fit into the U.S. Navy's current Aegis Ballistic Missile Defense destroyers. It will be fired from its standard Vertical Launch System and integrated with the modified Baseline 9 Aegis Weapon System that detects, tracks, controls and engages hypersonic threats.

While Lockheed was not awarded a contract to participate in next phase of the GPI competition, it is competing against Raytheon to develop scramjet-powered hypersonic missiles as part of the Hypersonic Air-breathing Weapon Concept (HAWC) program run by the Air Force and DARPA. And Lockheed is the lead systems integrator for what will be the Navy's Conventional Prompt Strike offensive hypersonic missile and the Army's Long Range Hypersonic Weapon. Northrop Grumman designed the motor for both weapons. Lockheed is also developing the Air Force's hypersonic AGM-183A Air-launched Rapid Response Weapon....

Northrop began a push to develop hypersonic missile capability in 2019 when the Pentagon made hypersonic capability a priority. That same year, Lockheed Martin broke ground on a new facility in Alabama geared toward developing, testing and producing hypersonic weapons.

The MDA hit the pause button on its hypersonic weapons interceptor effort in summer 2020 to bring a defensive hypersonic weapon online. But the agency took steps in 2022 to move forward again and received feedback from

industry confirming a glide phase interceptor is something that can be done "and we shouldn't be afraid to go do it" About a year ago, the agency revamped its approach to hypersonic weapons, opting to focus on taking out hypersonic weapons in the glide phase of flight, where they are most vulnerable.... The agency has yet to detail

the program's schedule for subsequent phases, but, according to fiscal 2023 Pentagon budget justification documents, the agency plans to reach weapon system and missile systems preliminary design reviews in the fourth quarter of FY27.

Source: <https://www.defensenews.com/pentagon/2022/06/24/raytheon-northrop-advance-in-competition-to-develop-hypersonic-weapons-interceptor/>, 25 June 2022.

The interceptors are intended to counter a hypersonic weapon during its glide phase of flight, a challenge as the missiles can travel more than five times the speed of sound and can maneuver, making it hard to predict a missile's trajectory. The interceptors will be designed to fit into the U.S. Navy's current Aegis Ballistic Missile Defense destroyers.

Each kilowatt-hour (kWh) of electricity produced by EDF's reactor fleet in France emits the equivalent of less than 4 grams of CO2, according to a life cycle analysis (LCA) published by the company. The analysis shows most of these emissions occur in the upstream phases of the life cycle.

NUCLEAR ENERGY

FRANCE

EDF Study Confirms Very Low Carbon Nature of Nuclear

Each kilowatt-hour (kWh) of electricity produced by EDF's reactor fleet in France emits the equivalent of less than 4 grams of CO2, according to a life cycle analysis (LCA) published by the company. The analysis shows most of these

emissions occur in the upstream phases of the life cycle. EDF said the study - published on 16 June - was carried out on the nuclear fleet in operation, and according to a standardised methodology. "It is integrated and relates not only to the climate change criterion, but also to nine other environmental impact criteria, in order to assess not only the transfers between stages of the life cycle, but also between criteria," it noted.

"The LCA methodology is standardised, its implementation requires great rigor and the collection of a considerable amount of data for which the professions have been strongly solicited," EDF said....

The scope of the study includes data from EDF's nuclear fleet in 2019: 34 900 MW reactors, of which 22 use MOXfuel, 20 1300 MW reactors, and 4 1450 MW reactors. It therefore takes into account the production of the two Fessenheim units, shut down in 2020. The study does not take into account the transmission of electricity. The analysis found that electricity generated by the fleet emitted a total of 3.7g CO2 equivalent per kWh. The upstream phases of the cycle account for 57% of these emissions, while the 'production' stage represents 28%. Construction represents 16%, with the main contributors being cement (6%), non-alloy steel (3%) and reinforcing steel (2%). Decommissioning represents only a marginal share: 3%, while exploitation represents 9%.

Sensitivity studies show that a 60-year reactor operating life reduces the carbon footprint by 8% (3.4g CO2/kWh) compared with a 40-year operating life. The impact of a 10% change in annual electricity production compared with 2019 is 0.1 g CO2/kWh, EDF said. The company

concludes that the overall sensitivity offers a range of 2.9-4.6g CO2 eq/kWh. EDF said the result of the LCA "confirms the very low carbon nature of this energy. The study also aims to identify the most efficient environmental improvement actions and is part of an environmental management objective. It aims at a better understanding of the contributions of each step."

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South Korea will expand the role of nuclear energy to meet its climate target. President Yoon's new government will increase the portion of atomic power in the energy mix to meet its emissions reductions goal, or Nationally Determined Contribution, it said on June 16. It will maintain the target set by the previous administration to cut emissions by 40 per cent from 2018 levels by 2030.

Source: <https://world-nuclear-news.org/Articles/EDF-study-confirms-very-low-carbon-nature-of-nucle>, 20 June 2022.

SOUTH KOREA

South Korea's Nuclear Expansion Plans in Bid to Meet Climate Targets

South Korea will expand the role of nuclear energy to meet its climate target. President Yoon's new government will increase the portion of atomic power in the energy mix to meet its emissions reductions goal, or Nationally Determined Contribution, it said on June 16. It will maintain the target set by the previous administration to cut emissions by 40 per cent from 2018 levels by 2030.

Yoon, who took office on May 10, touted nuclear energy throughout his presidential campaign, claiming it should be included in the country's net-zero path along with renewable sources. If the country kept former President Moon's nuclear phase-out plans and decarbonisation policies, the cost of electricity could

jump fivefold from current levels by 2050, Yoon's office said in April.

South Korea, which gets more than 60 per cent of its electricity from coal and natural gas and another 30 per cent from nuclear, has pledged to reach climate neutrality by 2050. The nation has been struggling to boost the share of renewable

sources, which account for less than 8 per cent of generation. Renewable energy will continue to be deployed but will be kept at a “reasonable level” ... Construction will resume on the Shin Hanul Number Three and Four reactors, which were scrapped under the Moon administration, and the government will allow older atomic units to seek to extend their lifetime....

A detailed plan on how to achieve the NDC target with timelines and goals for different sectors will be announced after discussions with relevant people in the industry and a cost analysis.... One of the outcomes of last year’s COP26 climate talks was a request that nations should “revisit and strengthen” their 2030 climate targets by the end of this year. South Korea will also review its carbon emissions trading system to improve the effectiveness of the measure, the government said on June 16.

Separately, South Korea, which has been working on exporting nuclear technology to countries including Saudi Arabia and Poland, aims to build 10 reactors abroad by 2030.... South Korea will also continue to invest in developing nuclear-related innovations such as small modular reactors, the government said.

Source: <https://www.scmp.com/news/asia/east-asia/article/3181956/south-koreas-nuclear-expansion-plans-bid-meet-climate-targets>, 16 June 2022.

UAE

Operating Licence Issued for Unit 3 of Barakah NPP

The Federal Authority for Nuclear Regulation (FANR), the UAE independent nuclear regulator,

has issued the operating licence for unit 3 of the Barakah NPP to Nawah Energy Company, the Emirates Nuclear Energy Corporation (ENEC) subsidiary, responsible for operation of the plant. The operating licence, with an estimated duration of 60 years, authorises Nawah to commission and operate Barakah 3.

South Korea, which has been working on exporting nuclear technology to countries including Saudi Arabia and Poland, aims to build 10 reactors abroad by 2030.... South Korea will also continue to invest in developing nuclear-related innovations such as small modular reactors.

Construction of the \$20bn Barakah NPP began in 2011 after South Korea won a tender for the project in 2009. KEPCO led the consortium that is building the plant comprising four APR1400 reactors.

Construction of unit 1 began in July 2012, unit 2 in May 2013, unit 3 in September 2014 and unit 4 in September 2015. Overall construction is 97% complete. Units 1 and 2 are commercially operational, unit 3 is in the commissioning phase, and unit 4 is 92% complete.

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FANR said it conducted the assessment of the application for the unit 3 licence, following the issuance of the licences for the previous two units and adopted a systematic review process that included a thorough assessment of the application documentation, conducting robust regulatory oversight and inspections. The assessment included

reviewing the plant’s layout design and the analysis of the site’s location in terms of geography and demography. The assessment also included the reactor design, cooling systems, security arrangements, emergency preparedness, radioactive waste management and other technical aspects. FANR also assessed Nawah’s organisational and manpower readiness with all the required processes and procedures to ensure the safety and security of the plant.

FANR reviewed the 14,000-page operating licence application for units 3 & 4, conducted more than

120 inspections and requested additional information for unit 3 on various matters related to reactor design, safety and other issues to ensure compliance with all regulatory requirements. ...Nawah will now undertake a period of commissioning to prepare for commercial operation of unit 3 during which FANR will conduct around-the-clock inspections, using its resident inspectors in addition to deploying other inspectors, to ensure the fuel load and power accession processes are completed according to regulatory requirements....

Source: <https://www.neimagazine.com/news/newsoperating-licence-issued-for-unit-3-of-barakah-npp-978538720>, June 2022.

USA

NASA Announces Awards for Nuclear Power on the Moon

NASA and the US DOE are working together to advance space nuclear technologies. The agencies have selected three design concept proposals for a fission surface power system design that could be ready to launch by the end of the decade for a demonstration on the Moon. This technology would benefit future exploration under the Artemis umbrella.

The contracts, to be awarded through the DOE's Idaho National Laboratory, are each valued at approximately \$5 million. The contracts fund the development of initial design concepts for a 40kW class fission power system planned to last at least 10 years in the lunar environment. Fission systems are reliable and relatively small and lightweight

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compared with other power systems. They could enable continuous power regardless of location, available sunlight, and other natural environmental conditions. A demonstration of such systems on the Moon would pave the way for long-duration missions to the Moon and Mars....

Battelle Energy Alliance, the managing and operating contractor for Idaho

National Laboratory, led the Request for Proposal development, evaluation, and procurement sponsored by NASA. Idaho National Laboratory will award 12-month contracts to the following companies to each develop preliminary designs: Lockheed Martin of Bethesda, Maryland – The company will partner with BWXT and Creare; Westinghouse of Cranberry Township, Pennsylvania – The company will partner with Aerojet Rocketdyne; IX of Houston, Texas, a joint venture of Intuitive Machines and X-Energy – The company will partner with Maxar and Boeing.

... The Phase 1 awards will provide NASA critical information from industry that can lead to a joint development of a full flight-certified fission power system. Fission surface power technologies also will help NASA mature nuclear propulsion systems that rely on reactors to generate power. These systems could be used for deep space exploration missions....

"Artemis is the twin sister of Apollo and goddess of the

Moon in Greek mythology," NASA explains. "Now, she personifies our path to the Moon as the name of NASA's efforts to return astronauts and a new wave of science payloads and technology demonstrations to the lunar surface. When they land, American astronauts will step foot where no human has ever been before: the Moon's South

Pole.” According to NASA, the Artemis missions will use innovative technologies to explore more of the lunar surface than ever before. “We will collaborate with our commercial and international partners to establish the first long-term human-robotic presence on and around the Moon. Then, we will use what we learn on and at the Moon to take the next giant leap: sending the first astronauts to Mars.”

NASA says: “Starting in 2022, and throughout the decade, we will send a suite of science instruments and technology demonstrations to the lunar surface through commercial lunar payload deliveries. Prior to a lunar surface landing, we will fly two missions around the Moon to test our deep space exploration systems. We’re working toward launching Artemis I, an uncrewed flight to test the SLS and Orion spacecraft together, followed by the Artemis II mission, the first SLS and Orion flight test with crew.”

Source: <https://www.neimagazine.com/news/newsnasa-announces-awards-for-nuclear-power-on-the-moon-9795697>, 23 June 2022.

NUCLEAR COOPERATION

INDIA–RUSSIA

Russia Widens Support for Kudankulam Nuclear Power Plant

Russia is continuing to support units in the Kudankulam NPP notwithstanding geo-political developments. ZiO-Podolsk JSC (part of the machine-building division of Rosatom State Corporation - Atomenergomash JSC) has manufactured the heat-exchanging apparatus for the power unit No.5 of Kudankulam NPP. The relief tank has been prepared for shipment to India... The specialists of JSC OKB Hidropress developed technical design. The employees of the Department of Nuclear Engineering Equipment of ZiO-Podolsk JSC developed the working design documentation. They also provide maintenance

support of the product manufacturing.

The relief tank is one of the important elements of equipment for NPP. It is intended for condensation of steam coming from pressure compensator and other equipment of the primary circuit in the modes of heating and other operating modes of reactor. The apparatus is made of austenitic chromium-nickel steel. Weight of the item is 15 tons, length - about 8 m, diameter - 2,5 m, height - 4 m. Lifetime of the equipment is 40 years.

ZiO-Podolsk has an experience in manufacturing relief tanks of reactor compartments of NPPs with VVER (water-cooled power reactor) for domestic and foreign nuclear power plants. ZiO-Podolsk Mechanical Engineering Plant Joint-Stock Company (ZiO-Podolsk JSC) is one of the largest manufacturers of highly complex heat-exchanging equipment for facilities of the fuel and energy complex: nuclear and thermal power plants, oil and gas industry, shipbuilding. All Russian nuclear power plants, starting from the first NPP in Obninsk city in the world, are equipped with ZiO-branded equipment.

Source: <https://economictimes.indiatimes.com/news/india/russia-widens-support-for-kudankulam-nuclear-power-plant/articleshow/92364746.cms>, 21 June 2022.

POLAND–USA

Poland Expands Cooperation on SMRs and Large Reactors

Polish state-owned energy company Enea SA has signed an agreement with US SMR developer Last Energy to cooperate on the deployment of SMRs, potentially in Poland. Meanwhile, France’s EDF has signed further cooperation agreements with Polish companies to support its offer to supply 4 to 6 EPRs in Poland.

Under the letter of intent between Enea and Last

Energy, the two companies will initially cooperate on the development, construction and further distribution of SMRs. It also provides for the possibility of establishing a joint company in Poland, responsible for the implementation of Last Energy's SMR technology in Poland. After confirming the economic and technological viability and obtaining relevant certificates, the companies will decide on the scope of further cooperation based on the market analyses made and the needs of the Enea Group. The document was signed during the Congress 590 business conference in Nadarzyn near Warsaw. The event was attended by representatives of the Enea Group and Last Energy, as well as Poland's Deputy PM and State Assets Minister Sasin....

Last Energy's SMR technology is based on a pressurised water reactor with a capacity of 20 MWe or 60 MWt. Power plant modules would be built off-site and assembled in modules. Thanks to the use of ready-made modular components, a reactor is expected to be assembled within 24 months of the final investment decision. The assumed lifetime of the power plant is 42 years. Enea said the cooperation with Last Energy is in line with its development strategy, which provides for the creation of new business lines, as well as achieving climate neutrality by 2050.... Last Energy is a spin-off of the Energy Impact Center, a research institute devoted to accelerating the clean energy transition through innovation.

Polish heavy industry is embracing small reactors as a way to avoid burning coal for process heat and power. Chemical producer Synthos has established a subsidiary which has right to develop

Polish heavy industry is embracing small reactors as a way to avoid burning coal for process heat and power. Chemical producer Synthos has established a subsidiary which has right to develop projects around GE-Hitachi's BWRX-300, and is working with chemical producers PKN Orlen and Ciech on the potential for the BWRX to replace coal at their plants.

The first 1-1.6 GWe nuclear unit is to be commissioned in 2033, with five more units, or 6-9 GWe, to follow by 2040. The coastal towns of Lubiatowo and Kopalino in Poland's Choczewo municipality have been named as the preferred location for the country's first large nuclear power plant.

projects around GE-Hitachi's BWRX-300, and is working with chemical producers PKN Orlen and Ciech on the potential for the BWRX to replace coal at their plants. Synthos is also working with power company ZE Pak to examine whether BWRX-300s could replace coal at the P'tnów power plant.

EDF Signs More Cooperation Agreements:

In September last year, it was announced that six new large reactors could be built by 2040 as part of Poland's

plan to reduce its historic heavy reliance on coal, which is incompatible with climate commitments. EDF of France submitted a "non-binding preliminary offer" to supply six large EPR reactors in October. The company has now signed five new cooperation agreements with Polish companies during its fifth Polish-French Nuclear Industry Day

in O³tarzew, Poland. The event aimed to foster cooperation between Polish and French companies in support of EDF's preliminary offer....

Poland's Energy Policy for 2040 is based on three pillars: a just transition; a zero-emission energy

system; and good air quality. The first 1-1.6 GWe nuclear unit is to be commissioned in 2033, with five more units, or 6-9 GWe, to follow by 2040. The coastal towns of Lubiatowo and Kopalino in Poland's Choczewo municipality have been named as the preferred location for the country's first large nuclear power plant. ...

Source: <https://world-nuclear-news.org/Articles/Poland-expands-cooperation-on-SMRs-and-large-react>, 23 June 2022.

SOUTH KOREA– CZECH REPUBLIC

Industry Minister Lee Chang-yang has promoted Korea's capabilities in the nuclear energy field

during his visit to the Czech Republic to win an order for a new power plant project there, his office said. Korea is currently bidding on the European nation's 8 trillion won (\$6.19 billion) project to provide an additional reactor in its southern region of Dukovany.

During a meeting with his Czech counterpart, Jozef Sikela, Lee stressed Seoul's advanced nuclear power technologies and management prowess, which were shown through the Barakah project in the UAE, according to the Ministry of Trade, Industry and Energy. Under the 2009 contract, Korea built four nuclear reactors in Barakah, 270 kilometers west of Abu Dhabi. In March, the No. 2 Barakah reactor began commercial operations about a year after the first unit. ...

The Czech Republic launched a tender for the Dukovany project in March, and Korea Hydro Nuclear Power (KHNP), the U.S.' Westinghouse and France's EDF have passed a security appraisal. Participants have to submit preliminary bids by November, and the winner bidder is expected to be selected by around 2024, the KHNP said. During the meeting, the two ministers also agreed to boost cooperation in the SMR sector and hydrogen, as well as in such key industries as electric vehicles, batteries, semiconductors and military equipment. They decided to hold working-level meetings for follow-up discussions at an early date, the ministry said.

The new Yoon Suk-yeol government has been actively pushing to revive its nuclear energy industry, reversing the former administration's nuclear phase-out policy. Lee also met with Milos Vystřcil, the Czech Senate president, and explained the country's nuclear energy policy and technology capabilities, and asked for cooperation in deepening bilateral industry ties, according to the ministry.

Source: https://www.koreatimes.co.kr/www/nation/2022/06/113_331860.html, 29 June 2022.

NUCLEAR PROLIFERATION

IRAN

Iran Prepares Enrichment Escalation at Fordow Plant, IAEA Report Shows

IAEA inspectors verified on June 18 that Iran was ready to feed uranium hexafluoride (UF₆) gas, the material centrifuges enrich, into the second of two cascades, or clusters, of IR-6 centrifuges installed at Fordow, a site dug into mountain.

Iran is escalating its uranium enrichment further by preparing to use advanced IR-6 centrifuges at its underground Fordow site that can more easily switch between enrichment levels.... The move is the latest of several steps Iran

had long threatened to take but held off carrying out until 30 of the 35 countries on the IAEA's backed a resolution in June criticizing it for failing to explain uranium traces found at undeclared sites.

With indirect U.S.-Iran talks on reviving the 2015 Iran nuclear deal long stalled, any further escalation in Tehran's standoff with the West risks killing off hopes of reining in the Islamic republic's nuclear advances and lifting U.S. sanctions against it. IAEA inspectors verified on June 18 that Iran was ready to feed uranium hexafluoride (UF₆) gas, the material centrifuges enrich, into the second of two cascades, or clusters, of IR-6 centrifuges installed at Fordow, a site dug into mountain....

Iran informed the IAEA on June 20 that passivation of the cascade, a process that precedes enrichment and also involves feeding UF₆ into the machines, had begun on June 19. Importantly, the 166-machine cascade is the only one to have so-called "modified sub-headers", which make it easier to switch to enriching to other purity levels. Western diplomats have long pointed to that equipment as a source of concern since it could enable Iran to quickly enrich to higher levels.

Awaiting Clarification: Iran has also not told the agency clearly what purity the cascade will enrich to after passivation. Iran had previously informed the IAEA that the two IR-6 cascades could be used to enrich to 5% or 20% purity. "The Agency has yet to receive clarification from Iran as to which mode of production it intends to implement for

the aforementioned cascade, following the completion of passivation," the report said, which the IAEA confirmed.

At a different site, Iran is already enriching to up to 60%, close to the roughly 90% of weapons-grade and far above the 2015 deal's cap of 3.67%.

Iran has breached many of the deal's limits in response to the U.S. withdrawal from the deal in 2018 and its reimposition of sanctions. Iran denies seeking nuclear weapons. In response to the Board of Governors' resolution, Iran has ordered the removal of IAEA cameras installed under the 2015 deal and pressed ahead with the installation of IR-6 centrifuges at an underground plant at Natanz where the deal lets it enrich but only with far less efficient IR-1 machines. The 2015 deal does not allow uranium enrichment at Fordow.

Source: <https://www.reuters.com/world/middle-east/iran-prepares-enrichment-escalation-fordow-plant-iaea-report-shows>, 21 June 2022.

NORTH KOREA

North Korea Expands Work at Nuclear Test Site to Second Tunnel

North Korea appears to be expanding work at its nuclear test site to include a second tunnel, *CSIS* on June 16, as South Korean and U.S. officials say North Korea might conduct a nuclear test any day. Preparation work at the Punggye-ri Nuclear Test Facility's Tunnel No. 3 was apparently complete and ready for a possible nuclear test, the *CSIS* said in a report, citing commercial satellite imagery.

...The research group said that for the first time, analysts spotted new construction activity at the facility's Tunnel No. 4, "strongly suggesting an effort to re-enable it for potential future testing".

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Outside Tunnel No. 3, images showed a retaining wall and some minor landscaping with small trees or bushes, likely in anticipation of a visit by senior officials, it said. The two tunnels were never previously used for nuclear tests and their entrances were demolished in 2018, when North

Korea declared a self-imposed moratorium on testing nuclear weapons and its ICBMs. ...

Source: <https://www.reuters.com/world/asia-pacific/nkorea-expands-restoration-nuke-test-site-second-tunnel-report>, 16 June 2022.

RUSSIA

Russia to Send Belarus Nuclear-Capable Missiles within Months

Russia will supply Belarus with missiles capable of carrying nuclear warheads after the president complained about nuclear-armed NATO flights coming close to the Belarusian border. President Putin made the announcement on June 25 as he received Belarusian leader Lukashenko in Moscow.

At the meeting, Lukashenko expressed concern about the "aggressive", "confrontational", and

"repulsive" policies of Belarus's neighbours Lithuania and Poland. He asked Putin to help his country mount a "symmetrical response" to what he said were nuclear-armed flights by the US-led NATO alliance near Belarus's borders. Putin offered to upgrade Belarusian warplanes to

make them capable of carrying nuclear weapons amid soaring tensions with the West over Ukraine. Last month, Lukashenko said his country had bought Iskander nuclear-capable missiles and S-400 anti-aircraft anti-missile systems from Russia.

Source: <https://www.aljazeera.com/news/2022/6/25/russia-to-send-belarus-nuclear-capable>

missiles-within-months, 25 June 2022.

NUCLEAR NON-PROLIFERATION

GENERAL

1st UN Nuke Ban Treaty Meeting Urges “Immediate Action”

Parties to a UN treaty banning nuclear weapons called for “immediate action” to achieve a nuclear-weapons-free world as they wrapped up their first meeting on June 23. The statement, adopted at the end of the three-day meeting of parties to the TPNW in Vienna, said a prompt response is the only way for such weapons to never be used again at a time when Russia is threatening to use them in its war against Ukraine. Nuclear threats “further underscore the enormity of the danger posed by the existence of nuclear weapons.” ...

The statement expressed grave concern that nine countries—Britain, China, France, India, Israel, North Korea, Pakistan, Russia and the US—possess a total of around 13,000 nuclear weapons and insisted that “nuclear-armed states never use or threaten to use nuclear weapons under any circumstances.” Their concern comes as Russian President Putin has ordered the country’s nuclear forces on high alert in its aggression against Ukraine.

Also in the statement, the parties, including 65 countries and regions that have ratified the treaty, criticized countries under the nuclear umbrella of nuclear-weapons states, such as Japan, for not taking “any serious steps to reduce their reliance on nuclear weapons.” The parties will accelerate the implementation of the treaty “with the aim of further stigmatizing and de-legitimizing nuclear weapons and steadily building a robust global peremptory norm against them,” the declaration

said.

Japan, the only country in the world to have experienced the horrors of nuclear weapons in war, has not signed the nuclear weapons ban treaty and did not join the meeting, even as an observer, despite high expectations among survivors of the Hiroshima and Nagasaki bombings that it would. Germany, Norway and the Netherlands participated in the meeting with

observer status although their national defense depends on the U.S.-led nuclear umbrella as members of the NATO.

Sweden and Finland, which have applied to join NATO in the wake of Russia’s

invasion of Ukraine, as well as Australia, a key U.S. ally just like Japan, were also among observer participants. The participants hailed “valuable contribution to taking forward nuclear disarmament” by entities and people, including “hibakusha” or survivors and others who have been physically affected by nuclear radiation.

The nuclear-armed states, which are allowed to possess the weapons under the NPT, are against the nuclear weapons ban treaty. The ban treaty is the first international pact outlawing nuclear weapons development,

testing, possession and use. The first meeting was held to build momentum for abolishing the ultimate weapons of war. Friction remains between non-nuclear countries that support the nuclear ban treaty and nuclear-weapon states. The ban treaty will work constructively with the NPT, as it recognizes the NPT as the “cornerstone of the disarmament and nonproliferation regime.”

Source: <https://english.kyodonews.net/news/2022/06/b8242761bff9-1st-un-nuke-ban-treaty-meeting-calls-for-immediate-action-draft.html?>, 23 June 2022.

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IRAN

Nuclear Talks with US End without Deal in Qatar

Indirect negotiations between Iran and the US over Tehran's tattered nuclear deal with world powers have ended without breaking a deadlock over the talks, a semi-official Iranian news agency reported. The US State Department and the European Union, which is mediating the talks in Qatar, did not immediately acknowledge the end of the negotiations in Doha.

However, the semiofficial Tasnim news agency, believed to be close to Iran's hardline Revolutionary Guard, described the negotiations as finished and having "no effect on breaking the deadlock in the talks."

US Special Representative Rob Malley spoke to the Iranians through EU official Enrique Mora during the talks. Mora then took messages to Iran's top nuclear negotiator Ali Bagheri Kani. Tasnim claimed that the American position did not include "a guarantee for Iran benefiting economically from the deal," quoting what it described as unnamed "informed sources."

Source: <https://www.timesofisrael.com/nuclear-talks-with-us-end-without-deal-in-qatar-claims-iranian-report/>, 30 June 2022.

NUCLEAR SAFETY

INDIA

IAEA Mission Finds Solid Regulatory Arrangements in India, Notes Areas for Improvement

An IAEA mission said India's regulator showed a strong commitment and professionalism to ensure nuclear and radiation safety in the country. The team also noted areas where improvements can be made to strengthen the radiation safety regulatory oversight programme for all facilities and activities using radiation sources.

The Integrated Regulatory Review Service (IRRS) team on June 20 concluded a twelve-day follow-up mission to review progress in India's implementation of recommendations and suggestions made during an initial IRRS mission in 2015, which covered regulatory activities in relation to the country's nuclear power plants. The follow-up mission had an extended scope, also reviewing radiation sources. Such sources are used in facilities and in activities in the country in the field of research, industry, medicine and agriculture.

The follow-up mission was conducted at the request of the Government of India and hosted by the AERB.... The team found that the AERB generally implements the regulatory process and safety requirements in

accordance with the IAEA safety standards....The IRRS team highlighted the positive work the AERB has done to integrate regulatory processes into an online platform, saying it significantly improved the efficiency of the processes to regulate radiation sources. The review team also welcomed actions taken which directly addressed the recommendations of the 2015 mission, including: The improved inspection programme, including enhanced training and strengthening the powers of inspectors; The updated staff qualification and training programmes aimed at building and maintaining expertise necessary for discharging its responsibilities; The established process for regularly reviewing regulations and guides.

In their report, the team said it was important for the Government to ensure that the AERB has sufficient resources to continue their international engagement on the development of safety standards and the exchange of information on nuclear and radiation safety. They also made recommendations for improving the regulatory arrangements in the country, including: the need for a systematic manner in how safety assessments are included in the license application; revision of the frequency of planned inspections and the duration of validity of

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regulatory consent in accordance with a graded approach; development of a national policy and strategy to define responsibilities in regaining control over orphan sources; and the revision of regulations and guides, where appropriate, to ensure consistency with the IAEA safety standards and clarification of the hierarchy of the regulatory documents....

Source: <https://www.iaea.org/newscenter/pressreleases/iaea-mission-finds-solid-regulatory-arrangements-in-india-notes-areas-for-improvement>, 20 June 2022.

DRDO Developing Autonomous System to Tackle Nuclear Contamination

The DRDO is developing a new remotely operated system to survey radiologically affected areas and collect contaminated samples. Termed as Automatic Terrain Monitoring and Decontamination System (ATMADS), it will be a lightweight battery-powered autonomous vehicle outfitted with sensors, cameras and mechanical components to lift and store samples.

DRDO's Defence Laboratory, Jodhpur, which works in the area of nuclear radiation and sensor technologies, has been tasked with the execution of the project, which will be done in collaboration with the industry. According to DRDO sources, ATMADS is being designed to scan a potentially nuclear contaminated area, identify the source and location of the contamination and place the suspected samples into a radiation-proof container.

The unmanned vehicle will have an onboard navigation system to negotiate the terrain and the required equipment to monitor beta and gamma radiations, which would be relayed back to the control station through radio communication. ATMADS will be able to operate in a remote-controlled mode, where it will receive commands continually from the control station, as well as in

a fully autonomous mode, where it will be pre-programmed to carry out missions.

Artificial intelligence will be employed to carry out the operational tasks in the autonomous modes as well as for data processing and analysis. Pinpointing the source and assessing the extent of contamination is imperative for effective counter measures and decontamination operations, DRDO officials said.

Source: Vijay Mohan, <https://www.tribuneindia.com/news/nation/drdo-developing-autonomous-system-to-tackle-nuclear-contamination-407982>, 29 June 2022.

UKRAINE

Shelling Damages Kharkiv Nuclear Facility in Ukraine, Regulator Says

Russian shelling damaged a nuclear research facility in the northeastern Ukrainian city of Kharkiv on June 25, the State Nuclear Regulatory Inspectorate said. The strike damaged some of the site's buildings and infrastructure but did not affect the area housing nuclear fuel and radiation levels there are within a

normal range.... "The probability of new damage ... which can directly affect the state of nuclear and radiation safety, remains high due to shelling by Russian troops," it said....

Source: <https://www.reuters.com/world/europe/shelling-damages-kharkiv-nuclear-facility-ukraine-regulator-says-2022-06-25/>, 25 June 2022.

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NUCLEAR WASTE MANAGEMENT

USA

New Cocoon for US Legacy Reactor

Work has begun on a protective enclosure for a former reactor on the US DOE's Hanford site in Washington State. The K East Reactor is the seventh at the site to be placed in interim safe

storage. The K East Reactor was built to produce plutonium for US defence purposes and operated from the mid-1950s until 1971. The steel cocoon is designed to protect the reactor building while the radioactivity in the deactivated reactor core decays over the next several decades, making it safer and easier to complete disposition of the reactor in the future.

Construction of the structure's steel frame, which is one of the DOE Office of Environmental Management's key construction priorities for 2022, could begin after workers finished backfilling and compacting the area around the former reactor before pouring a 6-foot (1.8-metre)-thick concrete foundation to support construction of the cocoon. The first steel columns for the enclosure were placed in mid-May. The structural steel skeleton, with metal

siding on the walls and roof to fully enclose the building, is expected to be finished by the autumn. The completed structure will be more than 150 feet wide and 120 feet tall, and has been designed to allow for routine inspections of the reactor, which will take place every five years.

The steel cocoon is designed to protect the reactor building while the radioactivity in the deactivated reactor core decays over the next several decades, making it safer and easier to complete disposition of the reactor in the future.

According to the DOE Office of Environmental Management, about 80% of the buildings and auxiliary structures needed to support reactor operations are demolished and removed before cocooning takes place. The remaining 20% of the reactor complex, including the reactor core itself, is enclosed in a cement and steel, airtight and watertight structure which prevents any remaining radiation or contamination from escaping to the environment. ...

Source: <https://world-nuclear-news.org/Articles/New-cocoon-for-US-legacy-reactor>, 24 June 2022.



Centre for Air Power Studies

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

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