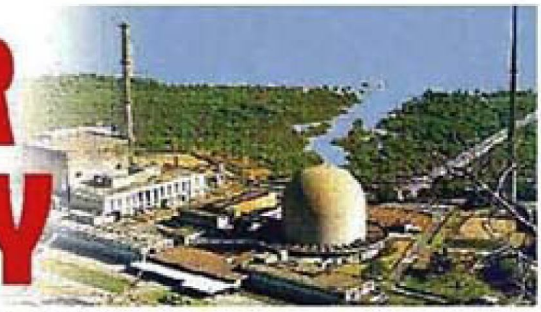
NUCLEAR SECURITY



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

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OPINION – Abhishek Bhalla

INS Arihant Missile Test: Nuclear Capabilities Not a Matter of Public Domain but Sometimes it's Important to Send a Message for Deterrence

Usually, any public mention of the word nuclear is taboo in India's security establishment. There is an unwritten rule that there will be no talk about India's nuclear capabilities and that remains veiled in secrecy when it comes to shaping public opinion. Not much is in the public domain and a few wry smiles and awkward expression is what we journalists get from officials in the security establishment when it comes to discussing India's nuclear arsenal. It's understandable, considering the sensitivity of the subject, not much can be divulged. It's against this backdrop that India's announcement of the recent missile test of a nuclear-capable submarine is noteworthy.

It's the first time any information about a missile test from INS Arihant was put out in the public domain. The short press statement giving out the information about the test without giving many details had a strong message in the last sentence. "A robust, survivable and assured retaliatory capability is in keeping with India's policy to have 'Credible Minimum Deterrence' that underpins its 'No First Use' commitment." This is a stand that India has always taken and the world has acknowledged its maturity. This gets even more significant at a time when the world is looking at Russia with anxiety over its possible threat of using nuclear weapons amid the ongoing war with Ukraine and US President Joe Biden calling Pakistan a dangerous country with nuclear weapons. While India's nuclear intentions have never been doubted, there have been concerns about Pakistan. It reinforces India's credibility and the stand on no first use

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commitment and having nuclear weapons only as a means of deterrence. In this context, it's important to understand that the official announcement of this test in the Bay of Bengal had a strong message not only for the international community but, for Indian citizens as well, that the country is secure.

India is among a few nations like Russia, France, China, UK, and US that have nuclear-capable submarines. While the official announcement about the test came, there was no word on the kind of missile used - the K4 - that has a range of about 750 km or the extended range K15, which can travel up to 3,500 km. Several attempts by me to get this information failed as the government did not want to give out specifics. In 2018, INS Arihant made its first deterrence patrol and the information was officially made public back then. With this, India completed its nuclear triad – having nuclear capabilities on air, land, and water. INS Arihant was commissioned into the Navy in 2016 after construction started in the mid-1990s. The construction of the submarine was part of a highly classified 'advance technology vessel' project under the supervision of the Prime Minister's Office.

While India's nuclear intentions have never been doubted, there have been concerns about Pakistan. It reinforces India's credibility and the stand on no first use commitment and having nuclear weapons only as a means of deterrence. In this context, it's important to understand that the official announcement of this test in the Bay of Bengal had a strong message not only for the international community but, for Indian citizens as well, that the country is secure.

An exact assessment of nuclear weapons is not possible as most countries don't like to put them in the public domain. When it comes to nuclear capabilities, Russia and US are far ahead of others. According to estimates, Russia has close to 6,000 nuclear warheads, slightly more than the US which has over 5,000 and 1,500 have been in deployment mode. Countries like the UK, France, India, Pakistan, China, Israel, and North Korea put together a little over 1,000 nuclear warheads, according to a fact sheet put out by the Arms Control Association that gives a clear picture of Russia's nuke power. The numbers put into perspective the chilling warnings sounded by Russia frequently amid the war with Ukraine.

Source: https://www.indiatoday.in/opinion-columns/story/ins-arihant-missile-test-nuclear-capabilities-not-a-matter-of-public-domain-opinion-2286143-2022-10-17, October 17, 2022.

OPINION – Sanchari Ghosh

Is it Time to Recognize North Korea as Nuclear State?

North Korea has developed nuclear weapons and announcing the same to the world last month, Kim Jong Un said the move was "irreversible". The weapons represent the "dignity, body, and absolute power of the state" and Pyongyang will continue to develop them "as long as nuclear weapons exist on Earth." As per reports, so far North Korea has launched a record number of over 20 missiles this year and is also said to entering its seventh underground nuclear test.

Though some experts argue that recognizing North Korea as a nuclear-armed state, something Pyongyang seeks, is a prerequisite, Washington has long argued that the North Korean nuclear program is illegal and subject to United Nations sanctions. However, Kim's threats cannot be taken lightly as generally does what he says he will do. Hence, the question is it already time to accept North Korea is a nuclear power? Also, what is the best way to deal with it?

How the World is Reacting to the Threat? The United States military, meanwhile, threatened that a nuclear attack on American interests would mean and "end" of Kim Jong Un's regime in the country. "Any nuclear attack by North Korea against the United States or its Allies and partners is unacceptable and will result in the end of that regime. There is no scenario in which the Kim regime could employ nuclear weapons and survive," the Nuclear Posture Review said

Aljazeera reported Japan and South Korea have also

warned that an "unparalleled" scale of response would be warranted if North Korea conducts a seventh test of a nuclear weapon. Noting that developments are closely being watched, the U.N. nuclear chief said that a new nuclear test explosion by North Korea "would be yet another confirmation of a programme which is moving full steam ahead in a way that is incredibly concerning."

Japan and South Korea have also warned that an "unparalleled" scale of response would be warranted if North Korea conducts a seventh test of a nuclear weapon. Noting that developments are closely being watched, the U.N. nuclear chief said that a new nuclear test explosion by North Korea "would be yet another confirmation of a programme which is moving full steam ahead in a way that is incredibly concerning.

What is the best option to deal with it? Experts point out that treating North Korea's nuclear program like Israel's – with tacit acceptance, is one of the best solution. "I think that the crucial step that (US President Joe) Biden needs to take is to make clear both to himself and to the US government that we are not going to get North Korea to disarm and that is fundamentally accepting North Korea as a nuclear state. You don't necessarily need to legally recognize it," Jeffrey Lewis, an adjunct professor at the James Martin Center for Nonproliferation Studies at the Middlebury Institute of International Studies in Monterey, told CNN.

Putin's nuclear threat marks the start of a new era. Russia's invasion of Ukraine makes at least one thing clear: It's time for us to update how we think about nuclear weapons. For the first time in the nuclear era, one country used loudly issued nuclear threats to deter other countries from intervening in a large-scale conventional war of aggression. We have entered the age of "predatory nuclear-weapon states.

And suggesting that, the US could deal with North Korea in the same way it deals with Israel and India, he said, "In both of those cases, the US knew those countries had the bomb, but the deal was, if you don't talk about it, if you don't make an issue out of it, if you don't cause political problems, then we're not going to respond. I think that's the same place we want to get to with North Korea."

Source: https://www.livemint.com/news/world/north-korea-nuclear-tests-how-the-world-is-responding-to-the-threats-11667054188378.html, October 29, 2022.

OPINION – Stephen Young

The Age of Predatory Nuclear-Weapon States has Arrived

Putin's nuclear threat marks the start of a new era. Russia's invasion of Ukraine makes at least one thing clear: It's time for us to update how we think about nuclear weapons. For the first time in the nuclear era, one country used loudly issued nuclear threats to deter other countries from intervening in a large-scale conventional war of aggression. We have entered the age of "predatory nuclear-weapon states."

For political analysts and military officials, this is not an unexpected phenomenon. On the contrary, the concept falls under the so-called stability-instability paradox. Because the threat of nuclear war is so terrifying and the risk of annihilation so real, lower-level conflict actually becomes more feasible. One nuclear-armed country can undertake major conventional military action, expecting that its nuclear capability will prevent outside intervention. That is what's happening in Ukraine. This is deeply problematic for international security. First, it is profoundly unjust. The world should not tolerate a status quo in which any nuclear-armed country can conduct conventional wars with impunity, slaughter tens of thousands and seize and annex territory, simply because its nuclear arsenal inhibits a strong military response. The international security system should not work that way.

Second, the fight for Ukraine significantly

increases the likelihood of nuclear war. Many experts asserted that Russia would not invade Ukraine, yet it did, highlighting the very real risk that Russian President Vladimir Putin still could use nuclear weapons, particularly if Moscow continues to lose the war. President Joe Biden recently urged Putin not to use nuclear weapons — a move that would end an invaluable 77-year-long taboo and alter the course of history, with potentially horrific costs.

The idea that nuclear deterrence plainly allows naked conventional aggression is not how most people think nuclear deterrence operates, nor how it should work. Most observers understand that deterrence is founded on the terrifying threat of nuclear annihilation, the ever-present risk of imminent death. Most wish the system was not in place, but they had become desensitized to the risk.

Third, the idea that nuclear deterrence plainly allows naked conventional aggression is not how most people think nuclear deterrence operates, nor how it should work. Most observers understand that deterrence is founded on the terrifying threat of nuclear annihilation, the ever-present risk of imminent death. Most wish the system was not in place, but they had become desensitized to the risk.

Ukraine changed that. Early on, nearly 70 percent of U.S. adults feared the invasion would lead to nuclear war — a reasonable, terrifying fear. It turns out nuclear weapons don't "keep the peace." Quite the contrary, they enable conventional conflicts where escalation to the "ultimate weapon" is entirely too possible. Deterrence does work. Russian nuclear capabilities and threats are deterring the United States. The Pentagon even delayed the flight test of a nuclear-armed missile, concerned it could heighten tensions. This is the strongest argument for nuclear deterrence: It prevents wider conflicts like the two world wars that killed tens of millions. But at what risk? The Ukraine war shows nuclear deterrence does not work as most imagined it, and the world is now a much more dangerous place than we thought. The risk of nuclear war leading to hundreds of millions of deaths is at its highest point in decades.

Ukraine war shows nuclear deterrence does not work as most imagined it, and the world is now a much more dangerous place than we thought. The risk of nuclear war leading to hundreds of millions of deaths is at its highest point in decades.

This fact could and should stimulate a shift in thinking about the value of nuclear weapons. With that in mind, there are four paths the world could possibly take. The first continuing the *status quo*, but that would be deeply dissatisfying. Prior to the Ukraine invasion, Russia, China and the United States were already improving or expanding their nuclear arsenals. Now some U.S. policymakers argue the United States needs more nuclear weapons, although their rationale is weak and counterproductive. The United States already has the most capable nuclear arsenal in the world, yet that did not stop Russia from invading Ukraine. How would *more* weapons help?

Another path could have countries like Brazil, Iran, Saudi Arabia, South Korea and Turkey acquiring nuclear weapons, leading to the collapse of the international non-proliferation regime and more countries following suit. With more countries armed, a nuclear war would happen sooner rather than later, with disastrous consequences. A third option is to try to rid the world of the "problem states" that possess nuclear weapons. Supporters of this approach would promote regime change in China, North Korea and Russia to avoid wars like the one in Ukraine. That also would be a recipe for disaster. Despite Russia's unprovoked attack on Ukraine, many nations have not joined the West in condemning it. China, meanwhile, is integrated into the global economy, and North Korea is paranoid and on alert. It is not feasible to eliminate any of those governments.

That leaves a fourth possibility, the most promising and the most secure. Recognize that nuclear weapons are the problem, and rather than creating a more nuclear-armed world or ousting rogue governments that have nuclear weapons, the world needs to eliminate nuclear weapons. It will not happen quickly, and the world would have to develop a new, truly stabilizing security regime to replace the current system built upon nuclear deterrence, but that effort should be the focus of international efforts moving forward. One place to start should be reforming the United Nations Security Council, where currently the five original nuclear-armed countries have permanent veto power over efforts to end conflicts around the world. There cannot be a new security system until that arrangement ends.

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A second is returning to arms control. That includes reaching bilateral U.S.-Russian agreements to cut nuclear arsenals (which will have to include limits on long-range missile defenses among other challenges); concluding two international agreements, the CTBT and the FMCT (two steps that would sharply hamper China's nuclear program); and building support for the Treaty on the Prohibition of Nuclear Weapons, the only emerging success in the nuclear field.

It's now clear the risk of continued reliance on nuclear weapons for security is even more dangerous than anyone imagined. It is time to move beyond nuclear deterrence. That is the best hope for the future of humanity.

Seventy-seven years ago, just two nuclear bombs ended World War II. Yet today nuclear-armed countries have more than 12,000 weapons, most of them far more destructive that the ones dropped on Hiroshima and Nagasaki. It's now clear the risk of continued reliance on nuclear weapons for security is even more dangerous than anyone imagined. It is time to move beyond nuclear deterrence. That is the best hope for the future of humanity.

Source: https://www.politico.com/news/magazine/2022/09/30/putins-nuclear-threats-towards-ukraine-00059571, September 30, 2022.

OPINION – Robert C. Koehler

15 Seconds Until Nuclear Armageddon

As war wreaks hell in Ukraine—and the threat of a nuclear confrontation between superpowers continues to intensify—NATO is in the process of prepping for the end of the world. "The preparation for nuclear war continues unbated, while the voices of opposition remain merely cries from the political margins". These words are from a 1992 essay by N. Arther Coulter published in a journal called Medicine and War. Who would have guessed? They're as relevant now as they were three decades ago. God bless Armageddon.

As war wreaks hell in Ukraine—and the threat of a nuclear confrontation between superpowers continues to intensify—NATO is in the process of prepping for the end of the world. It's an annual two-week training event called Steadfast Noon—a nuclear practice run that gives European flight crews a chance to practice loading and dropping "non-strategic" nuclear bombs. Russia is expected to conduct its own annual nuclear drill, known as Grom (that is, Thunder), soon as well. I can't read about this without summoning what I call "the big why?" from deep within. Endless resources are devoted annually to nuclear deterrence, a.k.a., the big bluff: "If you mess with me, you're gonna get it." The point, allegedly, is to prevent war, which is absolutely paradoxical in a global political system based on the psychosocial disease of militarism, i.e., the pursuit of national interest and the maintenance of safety primarily via force and violence.

No matter that this is the nuclear age, that force

and violence could go too far and wreak horror on everyone. The preparation for nuclear war continues unabated, while the voices of opposition remain merely cries from the political margins. There's no actual "debate" here, just a lot of powerless anguish, or so it seems. For instance, two years ago an open letter, signed by 56 former political leaders (including former prime ministers) of 20 NATO countries, as well as Japan and South Korea, was released to the world, pleading to current NATO countries—to all the nuclear-armed nations—to sign the Treaty on the Prohibition of Nuclear Weapons, which the U.N. passed in 2017 by a vote of 122-1. The nations represented by the letter's signatories have, of course, totally ignored the treaty, which was ratified last year, making nuclear weapons technically "illegal," which seems to mean nothing at all.

No matter that this is the nuclear age, that force and violence could go too far and wreak horror on everyone. The preparation for nuclear war continues unabated, while the voices of opposition remain merely cries from the political margins. There's no actual "debate" here, just a lot of powerless anguish, or so it seems.

The letter concludes thus: "With close to 14,000 nuclear weapons located at dozens of sites across the globe and on submarines patrolling the oceans at all times, the capacity for destruction is beyond our imagination. All responsible leaders must act now to ensure that the horrors of 1945 are never repeated. Sooner or later, our luck will run out—unless we act. The nuclear weapon ban treaty provides the foundation for a more secure world, free from this ultimate menace. We must embrace it now and work to bring others on board. There is no cure for a nuclear war. Prevention is our only option." Stunning words! They were signed by former leaders of the following countries: Albania, Belgium, Canada, Croatia, the Czech Republic, Denmark, Germany, Greece, Hungary, Iceland, Italy, Japan, Latvia, the Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, South Korea, Spain and Turkey.

The nuclear weapon ban treaty provides the foundation for a more secure world, free from this ultimate menace. We must embrace it now and work to bring others on board. There is no cure for a nuclear war. Prevention is our only option." Stunning words.

They also wrote: ". . .we appeal to current leaders to advance disarmament before it is too late." "We appeal . . .?" And suddenly the whole letter crawled back into the political margins. These were former prime ministers, former defense ministers, speaking the deepest possible political truth, but seemingly they had no more power to bring about the change—global nuclear disarmament—than I do. Behind the formal language was a simple plea:" Come on, guys. Nuclear militarism doesn't work. You know it as well as we do." But nothing has changed. Perhaps only when you're no longer in power do you become free of the psychosocial disease of militarism. And thus "nuclear deterrence," along with enormous, bloated military budgets, remains the way of the developed world. Militarism—including nuclear militarism—remains the way of the world, accompanied by an enormous shrug.

This being the case, it strikes me as appropriate to revisit fifteen seconds in the life of Stanislav Petrov, a lieutenant colonel of the Soviet Air Defense Forces, who, on Sept. 26, 1983, essentially saved the world from nuclear war. He was on duty at the command center outside Moscow where nuclear threat was monitored. Several hours into his shift that morning, the alarm went off. Oh my God! Computers immediately warned that the U.S. had just launched five ICBMs at the Soviet Union. "For fifteen seconds, we were in a state of shock," he later said. These were fifteen seconds in which the fate of humanity—your fate, my fate—were up for grabs. As the *New York Times* noted, this was a deeply tense period of the Cold War. Three weeks earlier, the Soviet Union had shot down a Korean Air Lines commercial flight flying over Soviet territory, killing all 269 people on board. And President Reagan had recently

declared that the Soviet Union was an "evil empire" and refused to freeze the arms race. Uh oh.

According to protocol, Petrov should have reported the alert up the military chain of command, with nuclear retaliation the likely result. But the computer warning seemed odd. It indicated that only five missiles had been launched, which made no sense. Why so few? In those fifteen seconds, as he recovered from his shock and pulled himself together, he studied the flashing maps. His gut instinct was: no, this isn't real. It's a false alarm. The Times wrote: "As the tension in the command center rose—as many as 200 pairs of eyes were trained on Colonel Petrov—he made the decision to report the alert as a system malfunction." And yes, his gut instinct proved accurate. Some clarity and sanity well down the military chain of command kept the world out of nuclear war. That time.

According to recent polls, 58% of the US population is scared that Russia is heading for nuclear war as is 49% of people living in Germany. Politicians, military officers and experts have been clenched with fear for some time already.

Source: https://www.commondreams.org/views/2022/10/21/15-seconds-until-nuclear-armageddon, October 21, 2022.

OPINION – Joscha Weber

The West Must Not Give in to Putin's Nuclear Threat

Given Ukraine's military successes and its supplies of Western arms, some experts warn that Russia will soon have only one option left: The atomic bomb. This is a false and dangerous narrative, says DW's Joscha Weber. Fear paralyzes us. Fear weakens us. Fear prevents us from looking at things clearly. And there is nothing that we are more afraid of than a nuclear war, which Russian President Putin is threatening once again. Because this could mean our ruin, apocalypse — the end.

This fear about the existence of the planet and humanity can be expressed in numbers: According to recent polls, 58% of the US population is scared that Russia is heading for nuclear war as is 49% of people living in Germany. Politicians, military officers and experts have been clenched with fear for some time already. Political scientist and Putin expert Gerhard Mangott of the Austria's University of Innsbruck has warned on German broadcaster Deutschlandfunk that if Ukraine continues to gain territory and the West continues to supply it with modern weapons, Putin will be left only with "nuclear escalation," and this is "increasingly likely" if Russia goes on the defensive.

Giving in to nuclear blackmail won't end the conventional war in Ukraine. It would, however, make future nuclear war much more likely." Fear is always a bad advisor especially in such situations. Resoluteness, unity, and strength are needed to resist atomic blackmail. If necessary, one's own arsenal should be mentioned.

West Must not Give In: What makes more sense than wanting to prevent the worst from happening? And if necessary, by making concessions to Putin? But this would be the worst of all options. If the West were to give in to Putin's nuclear blackmail, it would lose all the way. Ukraine would have to accept considerable territorial losses, Eastern European countries would rightly question whether the European Union and the US have their back and NATO could simply scrap its deterrence strategy. In short, Putin would have won. And he could use this tactic again, as US historian Timothy Snyder of Yale University concluded in a widely acclaimed essay....

Giving in to nuclear blackmail won't end the conventional war in Ukraine. It would, however, make future nuclear war much more likely." Fear is always a bad advisor especially in such situations. Resoluteness, unity, and strength are needed to resist atomic blackmail. If necessary, one's own arsenal should be mentioned.

Deterrence has to be credible and consistent; as anything else only serves to embolden Putin. This is what happened in 2013, when US President Barack Obama drew a "red line" on the use of chemical weapons in Syria. When it was crossed by the country's Russia-backed ruler Bashar Assad, the West did not intervene directly in the war. This also happened in 2014, when Russia annexed Crimea in violation of international law while the West merely looked on. Both cases probably encouraged Putin to attack Ukraine this year.

Putin has Plenty to Lose: Fear is exactly what Putin wants to generate with his hybrid warfare that combines military weapons, energy and disinformation. Though it is justified to be concerned about a nuclear catastrophe, it is also important to keep a cool head. By doing so, we will recall that Putin has been threatening to use nuclear weapons since the beginning of the war — but he has yet to take steps to mobilize nuclear forces.

Moreover, a marginalized nuclear power will not necessarily press the red button. Neither the Soviet Union nor the US did so during their disgraceful operations in Afghanistan and Vietnam respectively. One of the main reasons for this is often overlooked: A nuclear aggressor will automatically be a loser. Afterwards, it will not be able to do anything with a contaminated territory, nor will it have many allies left.

Moreover, a marginalized nuclear power will not necessarily press the red button. Neither the Soviet Union nor the US did so during their disgraceful operations in Afghanistan and Vietnam respectively. One of the main reasons for this is often overlooked: A nuclear aggressor will automatically be a loser. Afterwards, it will not be able to do anything with a contaminated territory, nor will it have many allies left. In this case, China, India and other states would turn away from Russia, something that is already beginning to happen it seems. Domestically, such a strike against the brother nation that Russia is supposed to be liberating would probably cost the president legitimacy and support. So, never fear. Putin himself has too much to lose.

Source: https://www.dw.com/en/opinion-the-west-must-not-give-in-to-putins-nuclear-threat/a-63452328, October 15, 2022.

OPINION – Editorial

Are We Overreacting or Underreacting to Russia's Nuclear Threat?

So far, Russia's war on Ukraine has had the positive effect of uniting NATO and prompting Finland and Sweden to ask for membership. It has united much of the world in sympathy and support for the Ukrainian people. But it has cost untold thousands of lives, destroyed families, rippled bad economic news around the globe, raised energy prices, threatened Europe's ability to stay warm during the coming winter and provided the unthinkable spectre of Russia carrying out threats to use tactical nuclear weapons. We join freedom-loving people everywhere in hoping for a swift end to the conflict that allows Ukraine to retain its independence. But we cannot escape the truth that war is never good, and that its human toll, touching good people on all sides, is incalculable.

As a rule, autocrats don't give up easily. They rely on perceived strength and brute force to stay in power. Vladimir Putin's newest assault — sending Russian missiles and Iranian drones on indiscriminate attacks directed at infrastructure and civilians — is as frightening as it is deadly. But it's also a sign of desperation.

We agree with *The Washington Post* editorial board, which said recently that the best thing the Biden administration and NATO allies can do is to "keep up sanctions and arms shipments that weaken Russia's military and empower Ukraine to fight back." President Biden has warned Putin about grave consequences if Russia unleashes nuclear weapons. At a recent fundraiser in New York, the president said he doesn't doubt Putin is serious about using such weapons, and he warned of "Armageddon" should such a thing happen. Indeed, the United States would face a tactical dilemma if Putin used even tactical nuclear weapons. Biden would be under pressure to join the conflict directly, limiting the U.S. to conventional

weapons but reinforcing America's role as the world's biggest power. But such an expansion of the war could easily spin out of control.

Indeed, the United States would face a tactical dilemma if Putin used even tactical nuclear weapons. Biden would be under pressure to join the conflict directly, limiting the U.S. to conventional weapons but reinforcing America's role as the world's biggest power. But such an expansion of the war could easily spin out of control.

It's important that Biden not make any specific threats in regard to retaliation. Specifically ones that would handcuff the White House in a situation that would require quick and nimble action. As Steven Pifer of the Bulletin of Atomic Scientists wrote this week, Ukraine's military is not gathered in large enough formations to make a nuclear strike profitable. Putin has not changed the nuclear posture of his forces or given any outward indication that his threat will be carried out imminently. Most likely, he is using the threat to frighten Ukraine into negotiating an end to the war.

But it would be wrong to err on the side of not taking the threat seriously. To the people of Ukraine, the war is existential, and the nation has shown every indication it intends to continue fighting under any circumstances — perhaps even a nuclear attack. Ukraine's advances, and especially its ability to damage the Kerch Strait Bridge and to regain thousands of square miles in the nation's east and south, have put Putin in a corner. That's a dangerous place, especially if it pushes him to respond in ways that threaten NATO member nations, but it is still a much better place than if Russia were winning. There are signs that Putin is beginning to lose his grip.

Some on Russia's right are blaming the Defense Ministry for the setbacks. Thousands of people have fled Russia in recent weeks ahead of Putin's planned draft. The war may threaten a worldwide recession. It may exacerbate the debts and deficit budgeting that plague many Western nations, including the United States. It may threaten Europe's energy supply and cause political upheaval. But if it is allowed to spread beyond the borders of Ukraine, it could do much more damage than that. Washington must tread confidently and cautiously at the same time, using its position as the world's strongest superpower to keep a lid on the conflict despite Putin's desperation to retain power.

Source: https://www.deseret.com/opinion/2022/10/12/23397646/russia-nuclear-threat-ukraine-war, October 12, 2022.

NUCLEAR STRATEGY

CHINA

China's Nuclear Strategy 'Transparent'

A senior Chinese diplomat emphasized that China was firmly committed to peaceful development, and its nuclear strategy, policy and related practices are responsible, and will not change. "China's nuclear strategy and policy have been long-standing and consistent with a high-level of stability, continuity and predictability, which are unique among nuclear weapon states as well as being the most responsible and transparent," said Li Song, China's ambassador for disarmament affairs, at the First Committee of the 77th Session of the UNGA. "Out of ulterior motives, certain countries recently made groundless speculations and slander accusations about China's nuclear policy and nuclear capability," said Li.

China's nuclear strategy and policy have been long-standing and consistent with a high-level of stability, continuity and predictability, which are unique among nuclear weapon states as well as being the most responsible and transparent," said Li Song, China's ambassador for disarmament affairs, at the First Committee of the 77th Session of the UNGA.

"Here, I would like to stress that China's nuclear strategy, policy and related practices are open and transparent, serious, and responsible. They will not change, nor be affected by those speculations

and accusation. China's unique nuclear policies and practices have made historic contributions to the international nuclear disarmament process and will continue to make constructive contributions to this end," said Li. He said China's nuclear strategy and policy have been long-standing and consistent with a high level of stability, continuity, and predictability, which are unique among nuclear weapon states as well as being the most responsible and transparent. China keeps its nuclear capabilities at the minimum level required for national security and does not engage in any nuclear arms race with any other country. China has always and will continue to take a responsible attitude and earnestly fulfill all its obligations of the NPT. The US and Russia, two countries with the largest and most advanced nuclear arsenals in the world, bear special and primary responsibility for nuclear disarmament. The two nations should further slash their nuclear arsenals in a verifiable, irreversible and legally binding manner to create conditions for the multilateral nuclear disarmament process, Li said.

China's nuclear strategy and policy have been long-standing and consistent with a high level of stability, continuity, and predictability, which are unique among nuclear weapon states as well as being the most responsible and transparent. China keeps its nuclear capabilities at the minimum level required for national security and does not engage in any nuclear arms race with any other country.

There is no one-size-fits-all template for nuclear arms control, nuclear reduction, or nuclear transparency. Therefore, nuclear disarmament should be advanced in a just and reasonable process of gradual and balanced reduction, following such principles as "maintaining global strategic stability" and "undiminished security for all", said Li.

Nuclear weapon states should reduce the role of nuclear weapons in their national security doctrines, commit to no first use of nuclear weapons, refrain from listing any country as a target for nuclear strike, and be committed to not using nuclear weapons against non-nuclear weapon states or nuclear-weapon-free zones unconditionally, said Li. He also adds that China calls upon the five nuclear weapon states to conclude a treaty on mutual no first use of nuclear weapons. Li also said that the "nuclear sharing" arrangement runs counter to the purpose and object of the NPT, and therefore should not be encouraged and must not proliferate. "Certain nuclear-weapon states have placed geopolitical interests above the international nuclear non-proliferation principles, adopted selective application of rules and double standards, and engaged in nuclear-powered submarine cooperation with a non-nuclear weapon state which is in contravention of the purpose and object of the NPT," said Li.

Source: https://www.chinadaily.com.cn/a/202210/19/WS634 f66b 2a310fd2b29e 7d5d1.html, October 19, 2022.

North Korean leader Kim Jong Un oversaw the launch of two long-range strategic cruise missiles, state media reported, calling it a test to confirm the reliability and operation of nuclear-capable weapons deployed to military units. The test firing was conducted, and was aimed at "enhancing the combat efficiency and might" of cruise missiles deployed to the Korean People's Army "for the operation of tactical nukes.

NORTH KOREA

North Korea Says it Practiced Firing Nuclear-Capable Cruise Missile

North Korean leader Kim Jong Un oversaw the launch of two long-range strategic cruise missiles, state media reported, calling it a test to confirm the reliability and operation of nuclear-capable weapons deployed to military units. The test firing was conducted, and was aimed at "enhancing the combat efficiency and might" of cruise missiles deployed to the Korean People's Army "for the operation of tactical nukes" state media Korea Central News Agency (KCNA) said. Stressing that the test launch was another clear warning to its "enemies," leader Kim Jong Un said the country "should continue to

expand the operational sphere of the nuclear strategic armed forces to resolutely deter any crucial military crisis and war crisis at any time and completely take the initiative in it," according to KCNA. KCNA said Kim had guided nuclear tactical exercises targeting South Korea over the past two weeks in protest of recent joint naval drills by South Korean and U.S. forces involving an aircraft carrier.

KCNA reported that the two missiles test-fired flew for 10,234 seconds and "clearly hit the target 2,000 km (1,240 miles) away." A U.S. State Department spokesperson declined to comment on the launches, and said Washington remained focused on coordinating closely with its allies and partners to address the threats posed by North Korea.

South Korean President Yoon Suk-yeol's office said the North's cruise missiles do not pose a threat as they are "slow enough to be intercepted," but Seoul is ready to sternly respond to Pyongyang's provocations with "overwhelming forces."

The South's military also said it had monitored the launch in real time and was continuing to analyse data from the tests. North Korea first tested a "strategic" cruise missile in September 2021, which was seen by analysts at the time as possibly the country's first such weapon with a nuclear capability. [The] test confirms that nuclear role and that it is operational, although it is unclear whether North Korea can build warheads small enough for a cruise missile. The cruise missiles are among a number of smaller weapons recently developed by North Korea to fly low and maneuver so as to better evade missile defences. Kim said last year that developing smaller warheads was a top goal, and officials in Seoul have said that if the North resumes nuclear testing for the first time since 2017, developing smaller devices could be among its aims. ...

Source: https://www.reuters.com/world/asia-pacific/nkorean-leader-guided-test-firing-long-range-strategic-cruise-missiles-state-2022-10-12/ , October 12, 2022.

RUSSIA

Putin Says 'No Need' for Using Nuclear Weapons in Ukraine

Russian President Vladimir Putin on 27 October denied having any intentions of using nuclear weapons in Ukraine but described the conflict there as part of alleged efforts by the West to secure its global domination, which he insisted are doomed to fail. Speaking at a conference of international foreign policy experts, Putin said it's pointless for Russia to strike Ukraine with nuclear weapons. "We see no need for that," Putin said. "There is no point in that, neither political, nor military."

Without offering evidence, the Russian leader repeated Moscow's unproven allegation that Ukraine was plotting a false flag attack involving a radioactive dirty bomb it would try to pin on Russia. Ukraine has strongly rejected the claim, and its Western allies have dismissed it as "transparently false.

Putin said an earlier warning of his readiness to use "all means available to protect Russia" didn't amount to nuclear saber-rattling but was merely a response to Western statements about their possible use of nuclear weapons. He particularly mentioned Liz Truss saying in August that she would be ready to use nuclear weapons if she became Britain's prime minister, a remark which he said worried the Kremlin. "What were we supposed to think?" Putin said. "We saw that as a coordinated position, an attempt to blackmail us."

Without offering evidence, the Russian leader repeated Moscow's unproven allegation that Ukraine was plotting a false flag attack involving a radioactive dirty bomb it would try to pin on Russia. Ukraine has strongly rejected the claim, and its Western allies have dismissed it as "transparently false." Ukraine argued Russia might be making the unfounded allegation to serve as a cover for its own possible plot to detonate a dirty bomb.

Putin said he personally ordered Russian Defense Minister Sergei Shoigu to call his

foreign counterparts to tell them about the purported plot. He maintained that Russia knows the Ukrainian facilities working on the project.

Putin claimed, still without citing any proof, that Kyiv's plan was to rig a missile with radioactive waste and to characterize its explosion as a Russian nuclear strike in an effort to isolate Russia in the global arena. He mocked the allegations by Ukraine and the West that Russia was firing on the territory of the Zaporizhzhia Nuclear Power Plant in southern Ukraine as "ravings." Russian troops have occupied the plant, Europe's largest, since the early days of the conflict and Moscow has accused Ukraine of continuously shelling it. ...

Source: https://www. pbs. org/newshour/world/ vladimir-putin-rules-out-using-nuclear-weapons-in-ukraine, October 27, 2022.

Putin Watches First Russian Nuclear Drill Since Invasion of Ukraine

Vladimir Putin has overseen annual exercises by Russia's strategic nuclear forces at a time of heightened tensions with the West over his eight-month-long war in Ukraine. Ballistic and cruise missiles were launched from the Arctic to Russia's Far East, the Kremlin said. The US was told about the drill under the terms of the New Start arms treaty.

The launches took place as Russia makes unsubstantiated claims that Ukraine was plotting to use a "dirty bomb". A "dirty bomb" is an explosive device mixed with radioactive material and the Russian allegations have been widely rejected by Western countries as false. Kyiv warned the claims indicate Moscow itself could be preparing such an attack.

The last Russian nuclear drill took place five days before it invaded Ukraine. Ahead of the latest exercise, military officials in Washington pointed out that, in notifying the US, the Russians were complying with arms control obligations.

Nato is also staging its own nuclear exercises, dubbed Steadfast Noon, in north-western Europe. The Western defensive alliance said training flights involving 14 countries were taking place over Belgium, the UK and the North Sea.

Russia's exercises were being held against a backdrop of a flagging campaign in southern and eastern Ukraine. Moscow has sent troops into the key southern city of Kherson to help defend it. Russia took Kherson in the early days of the war, but recently it has come under pressure as Ukrainian troops advance.

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Defence Minister Sergei Shoigu was seen on Russian TV saying that the aim of the drill was for military command and control to practise carrying out "a massive nuclear strike by the strategic nuclear forces in retaliation for the enemy's nuclear strike".

A Yars inter-continental ballistic missile was launched from Plesetsk cosmodrome, some 800km (500 miles) north of Moscow, and a Sineva ballistic missile was fired from the Barents Sea to the remote Kura test site in Kamchatka province in Russia's Far East, the Kremlin said. All missiles reached their targets, it added. ...

Source: Paul Kirby, https://www.bbc.com/news/ world-europe-63397927, October 28, 2022.

USA

US Nuclear Posture Review Brazenly 'Tailors' Nuclear Deterrence Strategy against China: Chinese Disarmament Ambassador

The US in its newly released Nuclear Posture Review (NPR) made irresponsible comments and groundless speculation on China's normal

modernization of nuclear forces, and brazenly "tailored" a nuclear deterrence strategy against China, which China is seriously concerned about and firmly opposes, Chinese Ambassador for Disarmament Affairs Li Song said. In his remarks at a plenary meeting of the First Committee of the UN General Assembly, Li said China urges the US not to assess China through the prism of its hegemony in which it imagines other countries to be rivals or adversaries.

China is not the US, will not become another US, and will not pursue the nuclear strategy of the US. China has the capability and confidence in safeguarding its national security interests and that China will not be intimidated by nuclear blackmail orchestrated by the US.

Li stressed that China is not the US, will not become another US, and will not pursue the nuclear strategy of the US. China has the capability and confidence in safeguarding its national security interests and that China will not be intimidated by nuclear blackmail orchestrated by the US, Li said.

He said China has always maintained its nuclear force at the minimum level required by its national security, and will not engage in a nuclear arms race with any other country.

The latest US nuclear strategy and related policies will definitely have a complex, far-reaching negative impact on global strategic security and stability, the strategic security relationship among major powers, as well as on the international and multilateral nuclear arms control, disarmament and non-proliferation processes.

The NPR hyped up major power competition and bloc confrontation, and was full of Cold War mentality and zero-sum mentality, which reflected the logic of hegemonism seeking absolute military superiority, Li said. This is clearly against the world's desire of preventing nuclear war and avoiding nuclear arms race, he said.

The US has further enhanced the role of nuclear weapons in its national security policy and lowered the threshold for their use, which has increasingly become the source of the risk for a future nuclear conflict, Li said. The latest US nuclear strategy and related policies will definitely have a complex, far-reaching negative impact on global strategic security and stability, the strategic security relationship among major powers, as well as on the international and multilateral nuclear arms control, disarmament and non-proliferation processes, he warned.

Li urged the US to abandon its Cold War mentality and the logic of hegemonism, pursue a rational and responsible nuclear policy, fulfill its special and primary responsibility in nuclear disarmament, and play its due role in maintaining global strategic stability and world peace and security. ...

Source: https://www.globaltimes.cn/page/202210/1278255.shtml, October 29, 2022.

Biden Security Strategy would Cut Role of Nukes, Boost Industrial Base

The U.S. must effectively compete with China through military modernization, including strengthening the defense industrial base, broad military modernization and new technologies in space, the Biden administration outlines in a long-awaited National Security Strategy (NSS). The new strategy boasts that the administration will flex its military muscle through "integrated deterrence" along with allies, though it lays out seemingly contradictory plans for its nuclear deterrence.

The strategy mention to ensure our nuclear deterrent remains responsive to the threats we face, we are modernizing the nuclear triad, nuclear command, control and communications, and our nuclear weapons infrastructure as well as strengthening our extended deterrence commitments to our allies. But this modernization comes as the Biden administration broadly wants to reduce the reliance on nuclear weapons

themselves. The administration plans to take "further steps to reduce the role of nuclear weapons in our strategy, and pursuing realistic goals for mutual, verifiable arms control, which contribute to our deterrence strategy and strengthen the global nonproliferation regime," the strategy says.

Broadly, the new strategy continues the existing plans for military modernization to compete with China, the U.S.'s pacing challenge, while also deterring Russia. The U.S. is in a "decisive decade" dealing with these two powers, along with transnational challenges from climate change, inflation and the pandemic.

NSA Sullivan told reporters that the NSS is the foundation for the upcoming public release of the Pentagon's National Defense Strategy (NDS) and Nuclear Posture Review (NPR). The administration has outlined goals to reverse the Trump administration's NPR plans to develop a low-yield, submarine-launched nuclear missile while continuing nuclear modernization plans such as the Ground-Based Strategic Deterrent intercontinental ballistic missile.

"You'll see, with respect to the Nuclear Posture Review that, in fact, it does depart from some of the Trump-era formulas, and in doing so, we believe displays a step forward toward the reduction of the role of nuclear weapons in American strategy," Sullivan says. Broadly, the new strategy continues the existing plans for military modernization to compete with China, the U.S.'s pacing challenge, while also deterring Russia. The U.S. is in a "decisive decade" dealing with these two powers, along with transnational challenges from climate change, inflation and the pandemic, Sullivan says. ...

Source: https://aviationweek.com/shows-events/ausa/biden-security-strategy-would-cut-role-nukes-boost-industrial-base, October 12, 2022.

BALLISTIC MISSILE DEFENCE

INDIA

India Successfully Tests New-gen Nuclear-capable 'Agni Prime' Ballistic Missile

The 'Agni Prime' is a two-stage canisterised solid-propellant missile with dual redundant navigation and guidance system. India on 21 October (Friday) morning successfully test-fired 'Agni Prime' - a new generation of ballistic missiles - from off the coast of Odisha. Defence officials said all test objectives were met and said that the third consecutive (and successful) test of the 'Agni Prime' had 'established the accuracy and reliability of the system'.

Performance was validated using data obtained by many tracking systems, including radar, telemetry and electro-optical systems, the officials said. These systems were deployed at different locations along the flight path, including two down-range ships at the terminal point, and covered the entire trajectory, officials added. The first test was in June last year, with the second six months later - in December. On both those occasions too the missile 'followed textbook trajectory and met all mission objectives with a high level of accuracy', officials said.

The 'Agni Prime', or 'Agni-P', is a nuclear-capable new-gen advanced variant of the Agni class of missiles; it is a two-stage canisterised missile with a maximum range of 2,000 km. Significantly, it weighs 50 per cent less than the Agni 3 missile and has new guidance and propulsion systems. In addition, since it is canisterised, it can be launched from rail or road, be stored for longer periods and can be transported as per operational requirements.

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Source: https://www.hindustantimes.com/india-news/india-successfully-tests-new-generation-agni-prime-ballistic-missile-101666343665560.html, October 21, 2022.

INS Arihant Launches Submarine Launched Ballistic Missile

The country's first ballistic missile nuclear submarine (SSMN) INS Arihant carried out a successful launch of a SLBM on 14 October, validating India's second strike nuclear capability. "The successful user training launch of the SLBM by INS Arihant is significant to prove crew competency and validate the SSBN programme, a key element of India's nuclear deterrence capability" the Ministry said.

The country's first ballistic missile nuclear submarine (SSMN) INS Arihant carried out a successful launch of a SLBM on 14 October, validating India's second strike nuclear capability. "The successful user training launch of the SLBM by INS Arihant is significant to prove crew competency and validate the SSBN programme, a key element of India's nuclear deterrence capability.

In November 2019, India formally declared its nuclear triad, stated in its nuclear doctrine, operational after INS Arihant completed its first deterrence patrol which means Arihant has begun prowling the deep seas carrying ballistic missiles equipped with nuclear warheads. Without confirming the particular missile, a defence source said it was not the longer K-4 SLBM in use. INS Arihant is presently armed with K-15 SLBM with a range of 750 km. The missile was tested to a predetermined range and impacted the target area in the Bay of Bengal with very high accuracy, the statement said. "All operational and technological parameters of the weapon system have been validated."

In November 2019, India formally declared its nuclear triad, stated in its nuclear doctrine, operational after INS Arihant completed its first deterrence patrol which means Arihant has begun prowling the deep seas carrying ballistic missiles equipped with nuclear warheads. Without confirming the particular missile, a defence source said it was not the longer K-4 SLBM but the older SLBM in use.

... The second indigenous SSBN Arighat, which is in advanced stages of sea trials, is scheduled to be commissioned within this year, though no official announcement has been made. In January 2020, the DRDO had successfully test fired a 3,500 km range SLBM K-4 from a submerged pontoon off Visakhapatnam coast. Once inducted, these missiles will be the mainstay of the Arihant class of SSBNs giving India the stand off capability to launch nuclear weapons submerged in Indian waters. ...

Source: https://www.thehindu.com/news/national/ins-arihant-launches-submarine-launched-ballistic-missile/article66010395.ece, October 14, 2022.

EMERGING TECHNOLOGIES AND DETERRENCE

CHINA

China Can Now Deploy Hypersonic Nukes on its Carriers

China's carrier-based aircraft may soon be equipped with hypersonic weapons, thanks to the development of a new sealant that protects against storage at sea and accelerates the repair and maintenance of the game-changing armament while afloat. *The South China Morning Post* reported that China's carrier-based hypersonic weapons are like the Russian Kinzhal air-launched hypersonic missile, which was first used in the Ukraine war. They can be used against air, surface and satellite targets and reach ten times the speed of sound with a range of 1,000 kilometers as noted this month in the Chinese journal *Aero Weaponry*.

The weapon extends the strike range of China's

carrier fleet to more than 2,500 kilometers, approximately the distance east of Taiwan to Guam, which increases the threat of an ultra-fast Chinese missile attack on the strategic but increasingly vulnerable US outpost in the Pacific. Until now, hypersonic weapons have not been deployed on aircraft carriers, according to reports. Xiao Jun, lead researcher at the China Airborne Missile Academy, and his team pointed out in the *South China Morning Post* article that hypersonic weapons are more difficult to repair at sea than conventional missiles.

They note that the critical areas of hypersonic weapons are shielded using high-tech material that protects against extreme flight temperatures but also allow communication signals to pass through. However, the research team noted that this material is susceptible to damage during transport, storage or mounting on an aircraft. In addition, the Chinese research team pointed out that when a damaged part is exposed to ocean humidity, salt, and mold, moisture absorption, expansion, deformation, blistering, debonding, or peeling can adversely affect the heat-resistant coating. Past solutions required a clean ground-based room and an experienced crew with sophisticated equipment to ensure that there are no defects on the finished surface.

To solve the problem, the research team developed a new sealing material that requires only one worker to remove the damaged part, fill in gaps with the sealing gel and smooth the finished surface with a scraper. The China Airborne Missile Academy researchers say that during field tests in poor conditions aboard aircraft carriers, the new method reduced service time to one-tenth of the previous approach. They said that their new technology improves the storage lifespan of hypersonic weapons, which the Chinese military requires to last at least a decade.

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The researchers claim that their new technology also allows for convenient field maintenance and periodic upgrades, as technicians inspect weapons and sometimes open them to enhance critical components such as infrared sensors. Moreover, they noted in the *South China Morning Post* report that repairs and body heat sealing need to withstand the extreme conditions of hypersonic flight and adverse conditions at sea for more than ten years while allowing for ease of maintenance under rough conditions.

The sealant technology will conceivably allow China to deploy hypersonic weapons on a broader range of its surface combatants, giving them a potential edge over their competitors, namely the United States, in surface warfare operations. This April, *Asia Times* reported that China had tested its YJ-12 hypersonic weapon from one of its Type 055 cruisers, making the class one of the heaviest armed warships in the world. Video footage from the test showed a cold-launched anti-ship ballistic missile armed with a hypersonic glide vehicle, with its small control surfaces suggesting it is not a surface-to-air missile.

The YJ-12 outwardly resembles China's CM-401 high-altitude anti-ship missile, which is based on Russia's Iskander mobile short-range ballistic missile. However, while China has successfully tested the ship-based YJ-12, an air-launched version could also be in the works. In contrast, the US will not be ready to deploy hypersonic weapons on its surface combatants until 2025.

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This March, *Asia Times* reported that the US aims to replace the troubled Advanced Gun Systems (AGS) on its Zumwalt class destroyers with hypersonic missile tubes, converting the futuristic and stealthy shore bombardment platforms into blue-water strike ones. As China is perceived to view its hypersonic weapons for strategic deterrence, it may also choose to arm its carrier-based strike aircraft with nuclear-tipped hypersonic weapons, taking a page from past US practice. ...

Source: https://asiatimes.com/2022/10/china-can-now-deploy-hypersonic-nukes-on-its-carriers/, October 14, 2022.

NUCLEAR ENERGY

CANADA

Canada Commits C$970 Million to New Nuclear Power Technology

Canada will provide C$970 million ($708 million) in financing to develop a grid-scale SMR, a new nuclear technology touted as a key part of the country's plans to reduce emissions, Natural Resources Minister Wilkinson said.

Canada will provide C$970 million ($708 million) in financing to develop a grid-scale SMR, a new nuclear technology touted as a key part of the country's plans to reduce emissions, Natural Resources Minister Wilkinson said. The project, which is being developed by utility Ontario Power Generation (OPG) in Darlington, Ontario, will be the first commercial grid-scale SMR in the Group of Seven wealthy nations (G7), according to the minister's spokesperson.

The project, which is being developed by utility Ontario Power Generation (OPG) in Darlington, Ontario, will be the first commercial grid-scale SMR in the Group of Seven wealthy nations (G7), according to the minister's spokesperson. The funding, offered as low-interest debt from the Canada Infrastructure Bank's (CIB) pool earmarked for clean power investments, would go toward preparation work required prior to nuclear construction, including project design and site preparation. The energy crisis triggered by the war in Ukraine has renewed interest in nuclear power, and next-generation SMRs are seen as efficient, quicker to build, and a way to possibly accelerate the shift away from fossil fuels.

"We are doing this because nuclear energy – as a non-emitting source of energy – is critical to the achievement of Canada's and the world's climate goals," Wilkinson said at the Darlington Energy Complex in Clarington, Ontario. Canada, like the rest of the G7, is targeting net-zero emissions by 2050. The government has an intermediate goal to cut emissions 40% to 45% below 2005 levels by 2030. "Nuclear power is one source that can help in reaching our climate targets while addressing growing future demand," Wilkinson said. OPG expects the SMR project to be completed by the end of the decade, and said in July that preparation work, such as building roads at the site, would start this year. The reactors are designed by GE Hitachi Nuclear Energy, an alliance between General Electric Co (GE.N) and Japan's Hitachi Ltd , and could power about 300,000 homes after completion, OPG says. About 15% of Canada's electricity comes from nuclear power, according to the World Nuclear Association.

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Source: https://www.reuters.com/business/energy/canada-backs-nuclear-power-project-with-c970-mln-financing-2022-10-25/, October 25, 2022.

FRANCE

Strikes at French Nuclear Plants - What's at Stake?

Strikes at France's nuclear power plants have affected about a third of its reactors, in many cases delaying maintenance work and complicating operator EDF's (EDF.PA) efforts to boost production ahead of winter. Currently 20 out of 56 reactors have been impacted, a union official said. Of these, maintenance plans of 17 have been disrupted, with some seeing their restart schedule delayed by a few days and some by up to three weeks. France's nuclear output was already expected to hit a 30-year low in 2022 due to a record number of reactor outages for corrosion issues and planned maintenance, at a time when Europe is facing an energy crisis because of the war in Ukraine. Rolling strikes over wages by the FNME-CGT union at some plants have added to the problem. Maintenance delays at nine reactors have caused the loss of 4.4 terawatt hours (TWh) of nuclear power generation - nearly a quarter of the power produced in September - compared to the maintenance schedule before the strikes began, data from consultancy Energy Aspects showed.

Currently 20 out of 56 reactors have been impacted, a union official said. Of these, maintenance plans of 17 have been disrupted, with some seeing their restart schedule delayed by a few days and some by up to three weeks. France's nuclear output was already expected to hit a 30-year low in 2022 due to a record number of reactor outages for corrosion issues and planned maintenance, at a time when Europe is facing an energy crisis because of the war in Ukraine.

A one day outage at an EDF reactor usually cost about 1 million euros ($976,600) but that at current electricity prices that could be "5 to 10 times more". With the baseload November power price around 587 euros ($573) per megawatt-hour (MWh), the cost of a reactor not running is probably not far from 10 million euros per day.

France is a net importer of electricity and the strikes will further boost power imports, particularly from Britain, the consultancy said. Power grid operator RTE warned that prolonged strikes further delaying the restart of reactors could have "heavy consequences" for electricity supply over the winter. Britain's National Grid has also cited maintenance issues at French nuclear reactors as a factor that could affect UK energy supplies this winter. RTE still expects France's nuclear power production to rise to between 40 and 45 gigawatt (GW) a day in December and January, up from 25-30 GW at the end of October. But it said the strikes raise a question mark over power availability for November. The strikes come on top of separate blockades at oil refineries over the past three weeks, which have disrupted fuel supplies.

What's the Cost? FNME-CGT secretary general Sébastien Menesplier said a one day outage at an EDF reactor usually cost about 1 million euros ($976,600) but that at current electricity prices that could be "5 to 10 times more". With the baseload November power price around 587 euros ($573) per megawatt-hour (MWh), the cost of a reactor not running is probably not far from 10 million euros per day, said Emeric de Vigan, vice president of power at data and analytics firm Kpler. However, French forward baseload contracts have fallen from highs over 1,000 euros in late August, as maintenance delays at EDF have been mostly be priced in. "With that being said, events like this come at the worst possible time, when French nuclear is needed the most, and even more so for the coming months," Rystad analyst Fabian Ronningen said.

What's the Legal Position? Workers are legally obligated to ensure the continuity of the public electricity service, requiring them to raise production or resume operations to return reactors to the grid to avoid power cuts. Vital services such as hospitals, road traffic signs, and security infrastructure are among the most protected public infrastructure from power cuts. Cuts to households would only be used as a last resort

to protect vital infrastructure. Contracts are held between the grid operator and industrial companies and businesses that can cover the first cuts in exchange for compensation. When lower production threatens to reduce supply to the point where it can't meet demand, RTE can ask striking workers to return some power to the grid to fix the imbalance. For example, RTE requested workers to raise power levels on Sept. 29 to ensure there was enough electricity to meet demand, and striking workers complied. But RTE cannot requisition workers. That power belongs to the CEO of EDF, following a decision by the Council of State after a two month strike in 2009 affected maintenance at 17 reactors.

However, EDF can only exercise this power to avoid serious consequences to electricity supply - such as power cuts and blackouts - and only if data from RTE showed a need for increased supply and there were no alternatives.

Source: https://www.reuters.com/business/energy/strikes-french-nuclear-plants-whats-stake-2022-10-19/, October 19, 2022.

GERMANY

Germany to Extend Lifetime of All 3 Remaining Nuclear Plants Amid Energy Crisis

Germany, which is experiencing an energy crisis this winter due to the Ukraine-Russia crisis has decided to establish the "legal basis" required to maintain all three of its existing nuclear power facilities operational until mid-April. Chancellor Scholz informed about this plan. Scholz wrote a letter to cabinet ministers saying, "The legal basis will be created to allow the operation of the nuclear power plants Isar 2, Neckarwestheim 2 and Emsland beyond December 31, 2022 until April 15, 2023." In order to lessen its reliance on Russian energy imports in the wake of the Ukraine crisis, Europe's largest economy had previously only agreed to keep two of the three reactors operating through their anticipated end-of-year phaseout. The fate of the Emsland plant in northern Germany had strained relations between Scholz's two coalition partners, with the nuclear-averse Greens refusing to support liberal FDP demands to keep the Emsland plant operational.

Lengthy disagreements within the ruling coalition government over the merits and drawbacks of nuclear energy delayed the implementation of a draft law to put the two plants on reserve beyond their planned phase-out at the end of this year.

Lengthy disagreements within the ruling coalition government over the merits and drawbacks of nuclear energy delayed the implementation of a draft law to put the two plants on reserve beyond their planned phase-out at the end of this year. After several rounds of negotiations in recent days failed to end the conflict, Scholz appears to have pulled rank with his statement. According to the letter, Scholz, a member of the center-left Social Democrats, was using his position as chancellor to issue an order. Scholz also requested that the ministries present an "ambitious" law to increase energy efficiency, and put into law an agreement to phase out coal by 2030. ...

As the colder winter weather draws closer, Germany is scrambling to secure adequate energy supplies and even restarting coal-fired power plants that had been stalled. Germany will keep two of its final three nuclear power plants, Isar 2 and Neckarwestheim 2, on standby as a backup until the spring of 2023, according to a major U-turn by Economics Minister Robert Habeck.

But as power prices soar and Russia cuts off gas supplies through the crucial Nord Stream 1 pipeline, the Ukraine war has fundamentally altered the global energy landscape, necessitating a radical rethink. As the colder winter weather draws closer, Germany is scrambling to secure adequate energy supplies and even restarting coal-fired power plants that had been stalled. Germany will keep two of its final three nuclear power plants, Isar 2 and Neckarwestheim 2, on standby as a backup until the spring of 2023, according to a major U-turn by Economics Minister Robert Habeck. However, the FDP had been putting increasing pressure on him to maintain all three plants, with its Finance Minister Christian Lindner claiming that they were required to "reduce prices and prevent blackouts."

Justice Minister Marco Buschmann from the FDP welcomed Scholz's decision on Twitter. "Common sense prevails," he wrote. "This strengthens our country because it ensures more grid stability and lower electricity prices."

Source: https://www.livemint.com/news/world/germany-to-extend-lifetime-of-all-3-remaining-nuclear-plants-amid-energy-crisis-11666027687221.html, October 17, 2022.

INDIA

Macron to Visit India Next Year, Jaitapur Nuclear Power Plant Expedited

The construction of the 1,650 MW nuclear power reactors at Jaitapur in Maharashtra is once again being pushed, as French President Emmanuel Macron has planned to travel to India next year. Macron is expected to visit India in "early 2023," according to French Minister Chrysoula Zacharopoulou, who made the announcement during a meeting with India's Minister of Science and Technology, Jitendra Singh. The technical, financial, and civil nuclear liability issues pertaining to the Jaitapur project will be resolved as soon as possible by both parties and well before Macron's scheduled visit, Singh assured the visiting minister.

India has announced plans to construct six 1,650 MW nuclear power plants at Jaitapur in Ratnagiri, which could become the nation's largest nuclear power site once completed with a 9,900 MW capacity.

India has announced plans to construct six 1,650 MW nuclear power plants at Jaitapur in Ratnagiri, which could become the nation's largest nuclear power site once completed with a 9,900 MW capacity. According to a public statement, Singh and Zacharopoulou talked about ways to hasten the installation of the nuclear power reactors at Jaitapur. The French delegation comprised French Ambassador to India Emmanuel Lenain and other officials, including Thomas Mieusset, Nuclear Counsellor. ...

Source: https://www.livemint.com/news/india/macron-to-visit-india-next-year-jaitapur-nuclear-power-plant-expedited-11666117435571.html, October17, 2022.

JAPAN

Japan Considers Extending Its 60-Year Limit on Nuclear Power Plants

Amid an energy crunch that served a severe blow to Japan's economy, the government in Tokyo is considering extending the lives of the country's nuclear power plant fleet beyond the maximum current lifespan of 60 years. According to local reports cited by Reuters, the plan is to remove the limits on nuclear power plants' lifetimes as a whole, which would open the door to serial extensions of these lifetimes. The changes will need to be approved by the Nuclear Regulation Authority.

Japan has 33 nuclear reactors, of which four have received approval to operate for a period of 60 years. This represents an extension on their original 40-year lifespans, as stipulated in the current nuclear power regulation that was implemented after the Fukushima tragedy. Currently, the regulations only allow one 20-year extension after the original 40-year period.

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Nuclear power has been an essential part of Japan's energy mic because of the country's resource scarcity, which has made it highly dependent on imported fossil fuels. Yet the Fukushima disaster in 2011 turned public opinion strongly against nuclear and the tide is only now turning again, this time in favor of nuclear. All in all, per information from the IEA, Japan relies on fossil fuels for 88 percent of its primary energy generation, which makes it one of the most fossil fuel-dependent members of the organization.

Nevertheless, Japan, like other IEA members, has ambitious net-zero plans for 2050, including a target of 60 percent for non-fossil fuel power generation by 2030. Nuclear is likely to play the star part in this shift given Japan's physical constraints that prevent it to emulate China, for example, with solar. Indeed, per the government's plans, nuclear is seen accounting for 20 to 25 percent of total electricity generation in Japan in 2030. That would be down from pre-Fukushima times when nuclear generated about a third of Japan's electricity, but a lot more than what it generated in 2020, which was about 5 percent of the total

Source: https://oilprice.com/Latest-Energy-News/World-News/Japan-Considers-Extending-Its-60-Year-Limit-On-Nuclear-Power-Plants.html, October 14, 2022.

USA

America is Building its First Nuclear Power Plant in Decades. Workers Just Started Stocking it with Radioactive Fuel

Workers have begun loading radioactive fuel into a new nuclear reactor in Georgia, putting the first new American nuclear reactor built in decades on a path to begin generating electricity in coming months. Georgia Power says workers will transfer 157 fuel assemblies into the reactor core at Plant Vogtle, southeast of Augusta, in the next few days. There are already two reactors operating at the plant, with fuel being loaded into a third unit and a fourth unit still under construction.

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...After the 90 tons (82 metric tonnes) of uranium oxide is loaded by a crane into the reactor, operating company Southern Nuclear will test whether the plant's cooling and steam supply system work while fuel is inside the reactor at the super-high temperatures and pressures created by splitting atoms. Operators will then start generating electricity and link the plant to the transmission grid, with the reactor planned to reach commercial operation by the end of March.

The Georgia Public Service Commission approved the new reactors in 2012, and the third reactor was supposed to start generating power in 2016. The cost of the third and fourth reactors has climbed from an original estimate of $14 billion to more than $30 billion. The Nuclear Regulatory Commission approved plans to load the fuel in August. Approval was delayed because much of the third reactor's wiring had to be redone after federal regulators found major flaws. Southern Co. also fell behind on inspection documents that had to be completed before the NRC could sign off.

Vogtle is the only nuclear plant under construction in the United States. Its costs and delays could deter other utilities from building such plants, even though they generate electricity without releasing climate-changing carbon emissions.

Georgia Power's 2.7 million customers are already paying part of the financing cost and state regulators have approved a monthly rate increase of at least $3.78 a month as soon as the third unit begins generating power. But the elected five-member Public Service Commission will decide later who pays for the remainder of the costs. The utility has other unrelated rate increases awaiting a decision. The fourth unit is supposed to be completed in late 2023. The two new units combined are projected to produce enough power for more than 500,000 homes and businesses. Vogtle is the only nuclear plant under construction in the United States. Its costs and delays could deter other utilities from building such plants, even though they generate electricity without releasing climate-changing carbon emissions. Georgia Power owns 45.7% of the two reactors, while Oglethorpe Power Corp. owns 30% on behalf of 38 power cooperatives. The Municipal Electric Authority

of Georgia owns 22.7% on behalf of 49 city-owned utilities, while the city of Dalton's utility owns 1.6%....

Source: https://fortune.com/2022/10/14/nuclear-power-plant-america-georgia-vogtle-radioactive-fuel/, October 14, 2022.

SMALL MODULAR REACTORS

CANADA

Federal Loan Provides Certainty for Canadian SMR Build

The Canada Infrastructure Bank (CIB) has announced a commitment of CAD970 million (USD713 million) towards Ontario Power Generation (OPG's) Darlington New Nuclear Project, in the bank's largest investment in clean power to date. The Darlington New Nuclear Project will be a 300 MWe small modular reactor (SMR), which is to be built next to OPG's existing Darlington nuclear power plant in Clarington, Ontario. OPG in 2021 selected GE Hitachi Nuclear Energy's BWRX-300 SMR for the project and aims to complete Canada's first commercial, grid-scale SMR as soon as 2028.

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The CIB's investment will finance Phase 1 work, covering all preparations prior to nuclear construction including project design, site preparation, procurement of long lead-time equipment, utility connections, implementation of a digital strategy, and related project management costs....As our largest clean power investment, we are supporting technology which can accelerate the reduction in greenhouse gases while also paving the way for Canada becoming a global SMR technology hub," he said.

Once built, the Darlington SMR will avoid around 740,000 tonnes of greenhouse gas emissions per year, according to OPG. It is also expected to spearhead similar projects in Saskatchewan, New Brunswick and Alberta, and will also support Canadian efforts to become a global SMR technology hub in a market estimated to be CAD150 billion per year by 2040. With an approved Environmental Assessment already in place, the site is the only location in Canada currently licensed for new nuclear. The CIB has to date committed some CAD5 billion towards clean power, renewables, district energy, storage, interties, and transmission.

Source: https://www.world-nuclear-news.org/Articles/Federal-loan-provides-certainty-for-Canadian-SMR-b, October 25, 2022.

FINLAND

Finland Eyes Small Reactor Nuclear Future, Talks with US

Energy giant Fortum is updating its strategy with a return to Nordic roots after the investment fiasco with Germany's Uniper. In line with developments elsewhere in Europe, alongside conventional reactors, the Finnish state-owned (51%) company will "explore prerequisites" for SMRs, a technology in which Washington is leading. In a two-year feasibility study announced, the company said it would look into the commercial, technological and societal, political, legal and regulatory conditions for a nuclear ramp-up in Finland and Sweden.

In line with developments elsewhere in Europe, alongside conventional reactors, the Finnish state-owned (51%) company will "explore prerequisites" for SMRs, a technology in which Washington is leading. In a two-year feasibility study announced, the company said it would look into the commercial, technological and societal, political, legal and regulatory conditions for a nuclear ramp-up in Finland and Sweden.

Fortum is emerging from a painful investment in Uniper, which Berlin nationalised last month, a move seen in Helsinki as an unavoidable measure and a relief despite heavy losses. The long-anticipated announcement that the German State

will take full control of the Finnish energy company Fortum's subsidiary Uniper was seen in Finland mostly as an unavoidable measure and a relief despite the heavy losses. Now Fortum says to achieve competitive construction times and to tackle costs, future ventures are to be based on partnerships between nuclear generating and district heating companies, industrial off-takers of power and heat, nuclear utilities and start-up companies.

The most notable SMR solutions already being developed are the ones by Rolls-Royce, GE-Hitachi, and Nuscale. In Finland, LUT University and the Technical Research Centre have a project for a plant with an output of 20-50 megawatts.

Besides conventional reactors, special attention will be given to SMRs, which according to Laurent Leveugle, leading the work at Fortum, "are promising in terms of taking nuclear power forward to future generations". The most notable SMR solutions already being developed are the ones by Rolls-Royce, GE-Hitachi, and Nuscale. In Finland, LUT University and the Technical Research Centre have a project for a plant with an output of 20-50 megawatts.

With no reactors so far, Estonia is progressing fast in its SMR plans. In the wake of Russia's invasion of Ukraine, Czechia and Slovakia have also voiced interest. Pro-nuclear EU countries are now flirting with building US-tech-dominant small modular reactors as large nuclear reactors, which cost billions, take decades to build, and cannot effectively replace Russian energy imports.

Regulatory Hurdles: However, the existing and outdated legislation with its licensing process may prove to be a hindrance. Commenting on the issue and Fortum's plans, Economic Affairs Minister Mika Lintilä (Center) said that revised legislation encompassing smaller reactors is under preparation. Currently, about 19% of Finnish energy needs are met by nuclear sources, and 39% in Sweden.

Europe's Small Reactors and the US: In Sweden, where nuclear energy has traditionally been met with resistance, new reactors will likely get a tailwind from the new far-right-backed government. The Finnish Fortum owns part of the country's Oskarshamn and Forsmark nuclear plants.

Meanwhile, Finland is not alone in its pursuit of more nuclear power. With no reactors so far, Estonia is progressing fast in its SMR plans. In the wake of Russia's invasion of Ukraine, Czechia and Slovakia have also voiced interest. Pro-nuclear EU countries are now flirting with building US-tech-dominant small modular reactors as large nuclear reactors, which cost billions, take decades to build, and cannot effectively replace Russian energy imports.

On 1 April, Czech state-owned energy giant ÈEZ announced that Many of these investments are supported by Washington, with the US leading country in SMR technology. A nuclear cooperation with the US is under negotiation, Lintilä revealed to Ilta-Sanomat. Poland and Romania are both currently cooperating with US companies in their pursuit of deploying SMRs. However, Europe's nuclear giant, France, is trying to catch up. French President Emmanuel Macron announced a €1 billion investment into its research and development in October 2021. He also said it is the "priority number one of French industry".

Source: Pekka Vanttinen and Vlad Makszimov, https://www.euractiv.com/section/politics/short_news/finland-eyes-small-reactor-nuclear-future-talks-with-us/, October 18, 2022.

NUCLEAR COOPERATION

CAMBOIDA–LAOS–VIETNAM

Cambodia, Lao PDR and Viet Nam Renew and Scale-Up South-South Cooperation Through Practical Arrangements, with IAEA Support

Under the terms of the Arrangements, Viet Nam will expand the support available to counterpart institutions in Cambodia and Lao PDR, particularly through the Vietnam Atomic Energy Agency

(VAEA).

Cambodia, Lao PDR and Viet Nam have agreed to expand their ongoing triangular cooperation in the application of nuclear technology, and to extend their cooperation agreement for a further five years. The three countries have been working together since September 2019, when, following months of deliberations, national representatives signed a series of Practical Arrangements (PAs) establishing a framework for South-South cooperation in non-destructive testing (NDT), nuclear medicine and mutation breeding. Last month, on the margins of the 66th IAEA General Conference, delegates from the three Southeast Asian countries met once again to expand their triangular cooperation into new areas of activity, and to extend this cooperation for an additional five years.

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On 27 September, the Deputy Minister of Science and Technology of Viet Nam, Le Xuan Dinh; the State Secretary of Mines and Energy of Cambodia, Ung Eang; the Deputy Minister of Education and Sport of Lao PDR, Sourioudong Sundara and IAEA Deputy Director General Hua Liu signed Practical Arrangements through which Viet Nam will support both short- and long-term education and training programmes in Cambodia and Lao PDR, with the Agency acting as an intermediary. Viet Nam will furthermore backstop the national technical cooperation programmes of its neighbours by providing experts and lecturers to institutions of nuclear science and technology in Cambodia and Lao PDR. Viet Nam will also make its technical facilities, including analytical laboratories, available to the other signatories of the Arrangements, which will ensure that Viet Nam's multi-faceted support includes practical and hands-on elements.

Since 2019, Viet Nam has dramatically expanded the support available to counterpart institutions in Cambodia and Lao PDR, particularly through the Vietnam Atomic Energy Agency (VAEA), the Viet Nam Atomic Energy Institute (VINATOM) and the Viet Nam Agency for Radiation and Nuclear Safety (VARANS), all of which have provided a series of virtual and in-person workshops and courses to benefit Laotian and Cambodian experts working in NDT, radiation protection and processing.

Renewing and Expanding South-South Cooperation: Since 2019, Viet Nam has dramatically expanded the support available to counterpart institutions in Cambodia and Lao PDR, particularly through the Vietnam Atomic Energy Agency (VAEA), the Viet Nam Atomic Energy Institute (VINATOM) and the Viet Nam Agency for Radiation and Nuclear Safety (VARANS), all of which have provided a series of virtual and in-person workshops and courses to benefit Laotian and Cambodian experts working in NDT, radiation protection and processing. Following these capacity building activities, and on the basis of an Action Plan developed in 2018, Viet Nam has also supported the establishment of a Non-Destructive Testing and Nuclear Engineering Centre in Lao PDR, which has also received critical equipment, training in advanced techniques and laboratory management from the IAEA.

In September 2021, following the organization of a virtual workshop on radiation protection, nuclear safety and inspections, facilitated by VARANS and VINATOM for the benefit of technical officers at Cambodia's Department of Nuclear Science and Technology, the trainees carried out their own training courses on the use of radiation detection equipment in January and April 2022, multiplying the effects of the original capacity building, for approximately 50 workers at Cambodian industrial facilities. Follow-up consultative meetings among the parties were held in March and July this year to

review the priority needs of the beneficiary countries, and to discuss the institutional and human capacities to be provided by Vietnamese institutions.

This resulted in the development of a consolidated Action Plan for the current national technical cooperation programmes of Cambodia and Lao PDR during the 2022-2023 IAEA technical cooperation cycle. The Action Plan addresses identified gaps with the goal of improving existing radiation safety infrastructure and regulatory functions, and scaling-up nuclear applications across all priority areas. The successful triangular cooperation between Viet Nam and Laos PDR, and Viet Nam and Cambodia, was showcased at the Global South-South Development Expo held in Thailand in September 2022.

The Russian government has approved a cooperation agreement with Morocco in the field of peaceful atomic energy, Russian news agency TASS reports. Russian PM Mishustin signed the corresponding order enabling the partnership between the two countries.

Source: https://www.iaea.org/newscenter/news/cambodia-lao-pdr-and-viet-nam-renew-and-scale-up-south-south-cooperation-through-practical-arrangements-with-iaea-support, October 20, 2022.

MOROCCO–RUSSIA

Morocco and Russia will Cooperate in the Nuclear Field

The Russian government has approved a cooperation agreement with Morocco in the field of peaceful atomic energy, Russian news agency TASS reports. Russian PM Mishustin signed the corresponding order enabling the partnership between the two countries. The document detailing the agreement - presented by the state atomic energy company Rosatom - highlights the interest of the Russian Foreign Ministry and 'other federal executive authorities that have previously worked with Morocco for peaceful purposes'.

Morocco and Russia will collaborate in at least 14 areas. Through this partnership, Moscow will help the North African country create and improve nuclear energy infrastructure, as well as water desalination plants and elementary particle accelerators. Russia will also contribute to the design and construction of nuclear reactors and share its expertise in the field of fuel cycle, spent nuclear fuel and waste management. Rosatom will also work with the Moroccan authorities in the exploration of uranium deposits, in the training of personnel for nuclear power plants and in the training of employees of the state body responsible for regulating nuclear and radiological safety, the National Centre for Nuclear Energy, Science and Technology (CNESTEN). This new agreement demonstrates Morocco's interest in developing the nuclear sector. The Kingdom has also recently entered into a partnership with Israel in this field. ...

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Source: Margarita Arredondas, https://atalayar.com/en/content/morocco-and-russia-will-cooperate-nuclear-field, October 13, 2022.

POLAND–USA

Poland Chooses US Firm to Build First Nuclear Power Plant

Poland is hoping to get its first-ever nuclear power plant online by 2033 with the help of a US firm. Russian aggression has pushed forward the long-awaited plan. A US firm has beaten out its French and South Korean competitors in landing a contract to build Poland's first-ever nuclear power plant,

Polish Prime Minister Mateusz Morawiecki said.

Westinghouse Electric Company was granted the multi-billion euro deal as Poland seeks to secure its energy supplies independent of Russian gas. "We confirm our nuclear energy project will use the reliable, safe technology of [Westinghouse]," Morawiecki wrote on Twitter. US Energy Secretary Jennifer Granholm welcomed the decision, calling it a "huge step in strengthening our relationship with Poland for future generations to come." "I think it sends a clear message to Russia that the Atlantic alliance stands together to diversify our energy supply... and to resist Russian weaponization of energy," Granholm also said.

Warsaw wants its first nuclear power station up and running by 2033 and has selected the village of Choczewo near the Baltic coast for the location. The EU recently categorized nuclear energy — as well as energy from burning natural gas — as "green" despite heavy pushback from countries such as Germany and Austria.

... Warsaw has been eyeing up development of its own civil nuclear capacity for years but was spurred into action by the Russian invasion of Ukraine and subsequent standoff with NATO, of which Poland is a member. Poland has one of the most carbon-intensive energy networks thanks to its heavy use of coal. But it hopes to meet between 25% and 36% of its energy needs with the up to six nuclear reactors it is planning to build by 2040.

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Source: https://www.dw.com/en/poland-chooses-us-company-to-build-its-first-nuclear-power-plant/a-63591358, October 29, 2022.

NUCLEAR DISARMAMENT

ISRAEL

Israel Must Get Rid of its Nuclear Weapons, UNGA Majority Decides

Israel never admitted to possess nuclear weapons, but nevertheless, the UNGA resolution was aimed at Israel, not Iran. Israel must dispose of all its nuclear weapons and place its nuclear sites under the IAEA's purview, the United Nations General Assembly's First Committee stated in an initial 152-5 vote. The five nations that opposed resolution on the "risk of nuclear proliferation in the Middle East" were: Canada, Israel, Micronesia, Palau and the United States. Another 24 countries abstained, including European Union members.

The annual resolution submitted by Egypt to the UNGA in New York was sponsored by the Palestinian Authority and 19 counties including Bahrain, Jordan, Morocco and the United Arab Emirates. The resolution largely targets Israel, which is believed to be one of only nine nations to possess nuclear weapons. Israel has never admitted to having such weapons.

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The resolution notes that Israel is the only country in the Middle East and one of the few among the UN's 193 member states, which has not signed the NPT. Iran, which is a signatory to the treaty, is believed to be on the path to developing nuclear weapons. Despite this, the resolution did not mention Iran. The resolution reaffirmed "the importance of Israel's accession to the NPT and placement of all its nuclear facilities under comprehensive international atomic Energy Nancy safeguards, in realizing the goal of universal adherence to the Treaty in the Middle East."

It further called on Israel "to accede to the Treaty without further delay, not to develop, produce, test or otherwise acquire nuclear weapons, to renounce possession of nuclear weapons and to place all its unsafe guarded nuclear facilities under the full scope of Agency safeguards as an important confidence-building measure among all Staes of the region and as a step toward enhancing peace and security." It was one of a slate of resolutions that the First Committee is approving, prior to a final vote in the UNGA plenum later this.

A nuclear-free zone in the Middle East? ...[T]he First Committee also approved with 170 votes — including Iran — a call for a nuclear-free zone in the Middle East. Israel was the only country that opposed the text. Four countries abstained: the United States, Cameron, Comoros and Tanzania. In a debate on the matter earlier this month, an Israeli deputy ambassador to the UN Michal Maayan said the NPT is only as relevant as the level of compliance and is not a remedy for the 'unique security challenges" of the Middle East. ...

Source: Tovah Lazaroff, https://www.jpost.com/international/article-720993, 30 October 2022.

NUCLEAR PROLIFERATION

IRAN

Iran Nuclear Deal Not Happening 'Anytime Soon,' White House Says

Negotiations for the United States and Iran to reenter an agreement on the production of nuclear fuel may be fatally stalled, White House press secretary Karine Jean-Pierre said on during a press briefing. "We don't see a deal coming together anytime soon," she said, even though she qualified that assessment by pointing out that "the door for diplomacy will always remain open." While not surprising, the admission made clear that roughly two years of efforts by the Biden administration may ultimately fail to produce results. Known as the Joint Comprehensive Plan of Action, or JCPOA, the accords were signed in 2015 and were, at the time, seen as a major accomplishment of the Obama administration's conciliatory diplomacy.

Under the agreement — which was also signed by fellow nuclear powers Russia, China, Germany, France and the United Kingdom — Iran agreed to curb efforts to produce a nuclear bomb and to open its nuclear processing facilities to international inspectors.

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In return, the United States and the European Union would lift the crippling sanctions that have devastated Iran's economy, impoverishing and isolating its citizens. Most conservatives criticized the deal, as did the allies of Israel in the U.S. foreign policy establishment. They cheered when then-President Donald Trump withdrew the United States out of the JCPOA in 2018, decrying it as "one of the worst and most one-sided transactions the United States has ever entered into." As with other aspects of American foreign policy, Joe Biden promised to reverse the withdrawal if he were elected president. Just days after taking office, he appointed veteran diplomat Robert Malley to restart JCPOA negotiations. Those negotiations had been slow, especially since Iranian diplomats refused to meet with Malley directly. But there was still optimism, however cautious, that Iran would ultimately recognize that a new deal was in its own best interests.

In recent weeks, however, prospects for a new JCPOA appear to have plummeted. For one, Iran is now supplying weapons for the Russian invasion of Ukraine; Iranian-made Shahed-136 "kamikaze" drones were used to launch attacks against Kyiv. It would be difficult for the Biden administration to argue that a regime fueling Russian President Vladimir Putin's brutal war in Ukraine can be trusted to curb its nuclear ambitions. The protests that have shaken Iran in

recent weeks have also complicated any hopes of a nuclear deal. Galvanized by the killing of Mahsa Amini, a young woman who refused to comply with strict rules regarding head coverings for women, the protests have exploded into a mass movement against Tehran's repressive policies.

Those policies were well known to the American diplomats who first forged the JCPOA and have tried, since 2021, to revive it. But the stories and images now emanating from Iran have trained worldwide condemnation on Tehran. ... Increasingly, that appears to be the conclusion also reached by the Biden administration. Much as Jean-Pierre did, State Department spokesman Ned Price acknowledged that a new Iran deal "is not our focus right now," as he put it at a briefing last week. Price praised the Iranian demonstrators for "the remarkable bravery and courage that the Iranian people are exhibiting through their peaceful demonstrations."

Ukraine's President Volodymyr Zelensky says Tehran supports Moscow with drones in its invasion in exchange for getting assistance to develop its nuclear program. Addressing the Haaretz Democracy Conference, Zelensky said that the Islamic Republic would have not been able to send equipment to Russia if Israel had not decided to stay neutral in the Ukraine war.

The Iranian foreign ministry website and official news agencies reported Amir-Abdollahian denying claims at a European summit that Iran had supplied Russia with military drones deployed in the Ukraine war.

Source: https://news.yahoo.com/iran-nuclear-deal-not-happening-anytime-soon-white-house-says-210156894.html, October 18, 2022.

Iran Gives Drones, Receives Nuclear Help from Russia: Zelensky

Ukraine's President Volodymyr Zelensky says Tehran supports Moscow with drones in its invasion in exchange for getting assistance to develop its nuclear program. Addressing the Haaretz Democracy Conference, Zelensky said that the Islamic Republic would have not been able to send equipment to Russia if Israel had not decided to stay neutral in the Ukraine war. "In eight months of full-scale war, Russia has used almost 4,500 missiles against us. And their stock of missiles is dwindling. Therefore, Russia went looking for affordable weapons in other countries to continue its terror. It found them in Iran," noted Zelensky.

The Ukrainian president further noted that "I have a question for you – how does Russia pay Iran for this, in your opinion? Is Iran just interested in money? Probably not money at all, but Russian assistance to the Iranian nuclear program. Probably, this is exactly the meaning of their alliance." Although Zelensky did not offer any evidence, Russia has built Iran's sole nuclear power plant in Bushehr and has a contract to expand the plant with the addition of two new reactors at a cost of $10 billion.

Zelensky's comments come as the Ukrainian Defense Ministry's Intelligence Directorate said that Russia's mobilized.... In remarks, Iran's foreign minister appeared to accept as possible, despite past denials, that Moscow had used Iranian drones in Ukraine. "If it is proven to us that Iranian drones are being used in the Ukraine war against people, we should not remain indifferent," Hossein Amir-Abdollahian said, as reported by Reuters. The Iranian foreign ministry website and official news agencies **reported Amir-Abdollahian** denying claims at a European summit that Iran had supplied Russia with military drones deployed in the Ukraine war.

Last week, Ukrainian Foreign Minister Dmytro Kuleba officially asked for air defense systems and training from Israel's Foreign Ministry in the face of attacks launched by Iranian Shahed drones. Yet, Israeli Defense Minister Benny Gantz stressed "that we are not selling weapons to Ukraine." However, **Israeli Prime Minister told *Jerusalem Post*** that Tel Aviv is increasingly concerned by the "dangerous closeness" between Moscow and Tehran over the supply of Iran-made

drones to attack Ukraine.

Lapid said Israel is holding daily assessments to review its position on the conflict, adding that "It's not something we are going to ignore or do nothing about...so what we need to do is reassess on a daily basis and react." Meanwhile, US House of Representatives Speaker Nancy Pelosi said that Iran was making the world less safe by supplying Russia with drones to be used against targets in Ukraine. The US has been "trying for a while now to have a nuclear agreement with Iran so that we can make the world a safer place and now they're going off aiding the Russians and making the world a less safe place," added Pelosi.

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Source: https://www.iranintl.com/en/202210251232, October 25, 2022.

NUCLEAR SECURITY

GENERAL

IAEA Builds Nuclear Security Detection Capabilities by Training Instructors for Front Line Officers.

Front Line Officers are positioned at strategic locations where illegal acts could be encountered, such as smuggling of drugs, human trafficking, and illicit trafficking of nuclear and other radioactive material. Ensuring they have a full understanding of the threats posed by criminal acts or unauthorized acts involving nuclear and other radioactive material out of regulatory control is an important component of a country's nuclear security detection architecture. "Front Line Officers are potentially first alerted about nuclear and other radioactive material out of regulatory control, either through information alerts or detection equipment alarms," said Daming Liu, Head of the IAEA's Section on Nuclear Security of Materials Outside of Regulatory Control. "A specific training programme that involves instructors in nuclear security detection is an essential part for the sustainable capacity building for Front Line Officers."

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From 2011 to 2015, the IAEA trained over 400 instructors from 32 countries as trainers for Front Line Officers on responsibilities in nuclear security detection operations. Recognizing the need for a consistent global approach, the curriculum has evolved in collaboration with the Department of Energy - Office of Nuclear Smuggling Detection and Deterrence (DOE-NSDD) of the United States of America, and the Joint Research Centre (JRC) of the European Union through Border Monitoring Working Group (BMWG). The revised curriculum was piloted in 2017 and first implemented in 2018. This builds training development and instruction capabilities in general, as well as instructors' capabilities for training Front Line Officers in nuclear security detection. To date, 62 instructors from 21 countries have been trained through four such training courses.

The course aims to improve participants' instruction skills and to prepare them to competently deliver a technical curriculum on detection of nuclear and other radioactive material out of regulatory control. The two-week course involves lectures focused on building a common understanding around instructional good practices for adult learners, and a 'teach back' segment of the technical course on detection of nuclear and other radioactive material out of regulatory control. Participants are then able to deliver the technical course in their

countries…. The training provided an understanding of the importance of security for nuclear and other radioactive material out of regulatory control and the role Front Line Officers play in countering threats. Capacity building of Front Line Officers through Systematic Approach to Training can never be overemphasized as it gives a firm foundation for the implementation of Integrated Nuclear Security Support Plan at national level….

Source: https://www.iaea.org/newscenter/news/iaea-builds-nuclear-security-detection-capabilities-by-training-instructors-for-front-line-officers, October 14, 2022.

MALAYSIA

IAEA Mission to Malaysia Finds Commitment to Nuclear Security, Encourages Training

An IAEA team said Malaysia was committed to improving its national nuclear security regime, including by strengthening coordination between relevant national authorities and by enhancing radiation detection capabilities at its borders. The team, which concluded a nuclear security mission to the country, encouraged Malaysia to further develop some of its nuclear security plans and procedures, supported by a more comprehensive programme of training and exercises for nuclear security bodies. The International Nuclear Security Advisory Service (INSServ), conducted from 11 to 21 October, was the second INSServ mission to the country, the first being in 2004. It was carried out at the request of the Government of Malaysia and hosted by the Department of Atomic Energy Malaysia (Atom Malaysia), the country's regulatory body for radiation and nuclear safety, nuclear security and safeguards.

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The mission team reviewed the country's legislative and regulatory arrangements to prevent, detect and respond to criminal and other intentional unauthorized acts involving nuclear and other radioactive material out of regulatory control. It also assessed related roles and responsibilities of Atom Malaysia, the coordination between stakeholders, arrangements for national nuclear security detection and response systems, and the security of Malaysia's borders to protect against nuclear security threats. INSServ missions focus on nuclear and other radioactive material out of regulatory control (MORC). This can be a result of theft, improper disposal or negligence. Malaysia uses radioactive sources in medical applications, industry, food processing and education and research. It also operates a number of major international seaports, such as the Port of Penang, through which thousands of goods containers and cruise passengers enter and leave Malaysia each year.

The team also identified a number of good practices, including the establishment of a national framework for nuclear security encompassing relevant laws, regulations and directives relevant to MORC, Malaysia's effective system to disseminate information to the public and media, and to encourage the reporting of security issues by the users of radioactive material, as well as the effective radiation screening of all import and export cargo at Penang Port.

… During these visits the INSServ team observed Malaysia's nuclear security capabilities relevant to MORC and some of the practices and procedures designed to protect Malaysia against nuclear security threats. The INSServ team made several recommendations to Malaysia to enhance its nuclear security regime in relation to MORC, such as the adoption of a more comprehensive training and exercise programme for nuclear security bodies.

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national framework for nuclear security encompassing relevant laws, regulations and directives relevant to MORC, Malaysia's effective system to disseminate information to the public and media, and to encourage the reporting of security issues by the users of radioactive material, as well as the effective radiation screening of all import and export cargo at Penang Port. ...

This is a guy (Xi Jinping) who understands what he wants but has an enormous, enormous array of problems. How do we handle that? How do we handle that relative to what's going on in Russia? And what I think is maybe one of the most dangerous nations in the world: Pakistan. Nuclear weapons without any cohesion.

Source: https://www.iaea.org/newscenter/pressreleases/iaea-mission-to-malaysia-finds-commitment-to-nuclear-security-encourages-training, October 21, 2022.

PAKISTAN

Major World Global Powers Anxious About Pakistan's Nukes

At a time when US President Joe Biden's words put the spotlight on Pakistan as "the most dangerous nation in the world", Pakistan's nuclear capabilities are also occupying a position of significance and creating anxieties for various major global powers. US President Biden at a Democratic Congressional Campaign Committee Reception in Los Angeles (California), during which he berated both China and Russia said, "This is a guy (Xi Jinping) who understands what he wants but has an enormous, enormous array of problems. How do we handle that? How do we handle that relative to what's going on in Russia? And what I think is maybe one of the most dangerous nations in the world: Pakistan. Nuclear weapons without any cohesion."

Pakistan's government, the Taliban, its various outfits in Pakistan and Afghanistan, and other jihadist groups inside Pakistan have created a worry over the nuclear weaponry falling into terrorist hands, reported Global Strat View. Pakistan supports the Taliban covertly. The world believes that Pakistan's nuclear program remains a threat of being stolen by terrorist organizations. Last year in August, after the withdrawal of US troops from Afghan soil, Afghanistan has quickly fallen into the Taliban's extremist clutches.

The political upheaval in Afghanistan also has regional repercussions, especially for those in neighbouring Pakistan. Meanwhile, Pakistan's continued production of fissile material and subsequent weapons, as well as the potential deployment of more tactical nuclear weapons, only makes the increasing possibility of the misuse of these materials more glaring and plausible, reported Global Strat View. ... There has been multiple instance when experts and US Presidents have expressed their concerns over Pakistan's nukes. ...Along the same lines, Generals Mark Milley, Chairman of the Joint Chiefs of Staff, along with their high-ranking generals, claimed their awareness of the risks the Afghanistan move would pose for Pakistan's nuclear weapons and its national security.

Ukraine's nuclear energy operator said that Russian forces were performing secret work at Europe's largest nuclear power plant, activity that could shed light on Russia's claims that the Ukrainian military is preparing a "provocation" involving a radioactive device. Russian Defense Minister Shoigu made an unsubstantiated allegation that Ukraine was preparing to launch a so-called dirty bomb.

Source: https://theprint.in/world/major-world-global-powers-anxious-about-pakistans-nukes/1176886/, October 21, 2022.

UKRAINE

Ukraine Alleges Russian Dirty Bomb Deception at Nuke Plant

Ukraine's nuclear energy operator said that Russian forces were performing secret work at Europe's largest nuclear power plant, activity that could shed light on Russia's claims that the Ukrainian military is preparing a "provocation" involving a radioactive device. Russian Defense

Minister Shoigu made an unsubstantiated allegation that Ukraine was preparing to launch a so-called dirty bomb. Shoigu leveled the charge over the weekend in calls to his British, French, Turkish and U.S. counterparts. Britain, France and the United States rejected it out of hand as "transparently false." Ukraine also dismissed Moscow's claim as an attempt to distract attention from the Kremlin's own alleged plans to detonate a dirty bomb, which uses explosives to scatter radioactive waste in an effort to sow terror.

Energoatom, the Ukrainian state enterprise that operates the country's four nuclear power plants, said Russian forces have carried out secret construction work over the last week at the occupied Zaporizhzhia Nuclear Power Plant in Ukraine. Russian officers controlling the area won't give access to Ukrainian staff running the plant or monitors from the U.N.'s atomic energy watchdog that would allow them to see what the Russians are doing, Energoatom said in a statement. Energoatom said it "assumes" the Russians "are preparing a terrorist act using nuclear materials and radioactive waste stored at" the plant. It said there were 174 containers at the plant's dry spent fuel storage facility, each of them containing 24 assemblies of spent nuclear fuel. "Destruction of these containers as a result of explosion will lead to a radiation accident and radiation contamination of several hundred square kms (miles) of the adjacent territory," the company said. It called on the International Atomic Energy Agency to assess what was going on. The U.N. Security Council was scheduled to hold closed-door consultations about the dirty-bomb allegations at Russia's request.

Russia asked the council to establish a commission to investigate its claims that the United States and Ukraine are violating the convention prohibiting the use of biological weapons at laboratories in Ukraine. Soon after Russia's Feb. 24 invasion of Ukraine, its U.N. ambassador, Vassily Nebenzia, claimed that secret American labs in Ukraine were engaged in biological warfare — a charge denied by the U.S. and Ukraine. The Kremlin has insisted that its warning of a purported Ukrainian plan to use a dirty bomb should be taken seriously and criticized Western nations for shrugging it off. The dismissal of Moscow's warning is "unacceptable in view of the seriousness of the danger that we have talked about," Kremlin spokesman Dmitry Peskov said. ...

When the connection to the external power line was cut, the plant's emergency diesel generators automatically started operating to provide the six reactors with the electricity they need for cooling and other essential safety functions, the IAEA said in a statement. "The fact that the plant's external power was lost because of an incident far away shows how vulnerable it is with only one power line connecting it to the grid," Grossi said in the statement.

Source: https://abcnews.go.com/International/wireStory/ukraine-nuclear-agency-thickens-alleged-dirty-bomb-plot-92052194, October 25, 2022

NUCLEAR SAFETY

UKRAINE

UN Nuclear Watchdog Says Power Restored at Zaporizhzhya Plant, Situation 'Precarious'

International Atomic Energy Agency chief Rafael Grossi speaks to reporters after visiting the Zaporizhzhya nuclear power plant last month. IAEA chief Rafael Grossi says power has been restored at the Zaporizhzhya nuclear power plant in Ukraine after the second outage in five days highlighted the "precarious" situation concerning the station's nuclear safety and security functions. "The outage was caused by shelling damage to a far off substation, highlighting how precarious the situation is. We need a protection zone ASAP," he said in a tweet on October 12. When the connection to the external power line was cut, the plant's emergency diesel generators automatically started operating to provide the six reactors with the electricity they need for cooling and other essential safety functions, the IAEA said

in a statement. "The fact that the plant's external power was lost because of an incident far away shows how vulnerable it is with only one power line connecting it to the grid," Grossi said in the statement. "The situation at the plant is clearly untenable and immediate action is required to strengthen nuclear safety and security and prevent a nuclear accident from happening."

...Grossi met with Russian President Vladimir Putin in Moscow on October 11 as part of efforts by the IAEA to prevent an accident and Grossi's push to establish a safety and security zone around the plant. October 13 for further talks regarding the power plant, the agency's statement said.

Source: https://www.rferl.org/a/ukraine-zaporizhzhia-nuclear-plant-grossi-power-warning/32076867.html, October 12, 2022.

G7 Calls for Return of Zaporizhzhia Nuclear Plant to Ukraine Control

The Group of Seven of the world's advanced economies condemned Russia's kidnapping of the leadership of Ukraine's Zaporizhzhia nuclear power plant and called for the immediate return of full control of the facility to Kyiv. "We condemn Russia's repeated kidnapping of Ukrainian" Zaporizhzhia nuclear plant "leadership and staff and denounce the application of other forms of pressure on remaining Ukrainian personnel," the Nonproliferation Directors General of the G7 countries wrote in a statement. The group includes the U.S., Canada, France, Germany, Italy, Japan and the U.K. They urged Russia "to immediately return full control" of the plant "to its rightful sovereign owner, Ukraine, to remove all Russian personnel from the facility, and to stop any attempts to recklessly and dangerously place" it under Russian administration "which could further jeopardize its safe and secure operations."

Russian President Putin this month ordered his government to take control of the Zaporizhzhia plant, Europe's largest nuclear power facility. The alarm over the nuclear plant comes as Ukraine's air force said in a statement that Russia launched a "massive missile attack" pounding energy facilities and other infrastructure in central and western parts of Ukraine, leaving hundreds of thousands of people without power. ... Energoatom, Ukraine's state nuclear energy agency, accused Russia of detaining two senior employees at the Russian-controlled Zaporizhzhia nuclear power plant in southern Ukraine, according to media reports. In a statement on social media, Energoatom said Russian forces "kidnapped" the head of information technology Oleg Kostyukov and the plant's assistant general director Oleg Osheka and "took them to an unknown destination." ...

The Group of Seven of the world's advanced economies condemned Russia's kidnapping of the leadership of Ukraine's Zaporizhzhia nuclear power plant and called for the immediate return of full control of the facility to Kyiv.

Source: https://www.politico.eu/article/g7-calls-for-return-of-zaporizhzhia-nuclear-plant-to-ukraine-control/, October 23, 2022.

NUCLEAR WASTE MANAGEMENT

USA

Idaho Resumes Radioactive Waste Shipments to New Mexico

Shipments of nuclear waste from the U.S. Department of Energy's site in eastern Idaho to a nuclear waste repository in New Mexico have resumed following three episodes that caused New Mexico officials to suspend them. An Energy Department official told Idaho officials that the New Mexico Environment Department last week gave the OK for shipments from the 890-square-mile (2,300-square-kilometer) site that includes the Idaho National Laboratory to resume to the department's Waste Isolation Pilot Plant near Carlsbad. The New Mexico agency suspended the shipments Sept. 14 following problems with three shipments.

Officials said a drum leaking liquid in April caused a partial evacuation at the plant, but no

contamination was reported. That was followed in July by another drum with a corrosion-like substance that escaped from the bottom, and in August by a shipment that appeared to have droplets on top... "We've got to make sure that what we're sending down there is safe," she said. "Obviously, it doesn't do any good for any of us to send shipments down that have to be turned back. It's embarrassing for us, it's costly, it wastes time, and it doesn't help Carlsbad maintain their capacity of emplacement." The commission makes recommendations to the governor regarding policies to support the viability and mission of the Idaho National Laboratory and other nuclear industries in the state. Commission members, appointed by the governor, include state lawmakers, local government elected officials, university officials and others.

The U.S. Department of Energy (DOE) announced $38 million for a dozen projects that will work to reduce the impacts of light-water reactor used nuclear fuel (UNF) disposal. The projects, led by universities, private companies, and national laboratories, were selected to develop technologies to advance UNF recycling, reduce the volume of high-level waste requiring permanent disposal, and provide safe domestic advanced reactor fuel stocks.

The lab, one of 17 Energy Department national labs, is the nation's top advanced nuclear energy research lab and is one of the state's largest employers, with about 5,000 workers. It's a huge economic driver in the state, especially in eastern Idaho, bringing in millions of federal research dollars. But the lab has a legacy of nuclear waste that the Energy Department is cleaning up. That includes about 40,000 barrels of transuranic waste composed of work clothing, rags, machine parts and tools contaminated with plutonium and other radioactive elements. Some barrels contain Cold War weapons waste generated at the former Rocky Flats Plant in Colorado that produced nuclear weapons.

The waste was exhumed, compressed and put into barrels for shipment. Some barrels weigh 700 to 1,100 pounds (320 to 500 kilograms). But some of the barrels have been sitting for more than five years in a facility without heat or air conditioning. Flohr said that aging appeared to cause problems with the integrity of some of the barrels. Ty Blackford, of the Idaho Environmental Coalition — the Energy Department contractor that manages cleanup operations at the Idaho National Laboratory site — said the protective cases used to ship the barrels worked to protect people and the environment from contamination. Workers are examining one of the failed barrels, he said.

... The Energy Department is required to remove the waste from Idaho following a 1995 agreement that was the culmination of a series of federal lawsuits. That agreement is viewed as preventing the Energy Department from converting the eastern Idaho site in high-desert sagebrush steppe to a high-level nuclear waste repository. The site sits above the Eastern Snake Plain Aquifer, which supplies water to cities and farms in the region. Flohr said the Energy Department could finish shipping the transuranic waste out of Idaho by late 2026 or early 2027. Other types of nuclear waste, including radioactive liquid waste, are also stored at the site

Source: https://apnews.com/article/new-mexico-idaho-us-department-of-energy-nuclear-waste-carlsbad-a997c332befc8ffd9265175f6b1b283e, October 14, 2022.

DOE Awards $38 Million for Projects Leading Used Nuclear Fuel Recycling Initiative

Selectees from Universities, National Laboratories, and the Private Sector Will Advance Technologies to Recycle Used Nuclear Fuel Generated from Commercial Nuclear Power Reactors. The U.S. Department of Energy (DOE) announced $38 million for a dozen projects that will work to reduce the impacts of light-water reactor used nuclear fuel (UNF) disposal. The projects, led by universities, private companies, and national laboratories, were selected to develop technologies to advance UNF recycling, reduce the volume of high-level waste requiring

permanent disposal, and provide safe domestic advanced reactor fuel stocks.

Nuclear energy generates/ nearly a fifth of America's electricity/ and accounts for half of all domestic clean energy generation. While used nuclear fuel, sometimes referred to as spent nuclear fuel, is created during the process of generating nuclear energy, clean energy generated from this fuel would be enough to power more than 70 million homes. Further, UNF can be recycled to make new fuel and byproducts that support the deployment of nuclear energy and advance President Biden's goals to offset climate change and domestic reliance on fossil energy through widespread clean energy use.

... Upon discharge from a nuclear reactor, the UNF is initially stored in steel-lined concrete pools surrounded by water. It is later removed from the pools and placed into dry storage casks with protective shielding. Most of the nation's used fuel is safely and securely stored/ at more than 70 reactor sites across the country. Projects funded through the Converting UNF Radioisotopes Into Energy (CURIE) program will enable secure, economical recycling of the nation's UNF and substantially reduce the volume, heat load, and radiotoxicity of waste requiring permanent disposal. These efforts will also provide a valuable and sustainable fuel feedstock for advanced reactors. Led by DOE's Advanced Research Projects Agency-Energy (ARPA-E), the following teams have been selected to develop separation technologies with improved proliferation resistance and safeguards technologies for fuel recycling facilities, and perform system design studies to support fuel recycling....

Source: https://www.energy.gov/articles/doe-awards-38-million-projects-leading-used-nuclear-fuel-recycling-initiative, October 22, 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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