



STATEMENT – Director General, IAEA

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Lecture at the Coral Bell School of Asia Pacific Affairs, ANU College of Asia & the Pacific

...Today, the factors of energy geopolitics and nuclear energy are again converging in a very significant way as energy security and climate change redraw global relationships, define development priorities, and reshape industries....

The Strong and Universal Non-Proliferation Regime: ...The case for the NPT, remains strong. It remains strong also for regional nuclear weapon free zone treaties, such as the Treaty of Raratonga; and of the indispensable need for the IAEA. The NPT has 192 signatories and the IAEA has 175 Member States. 178 States have signed a Comprehensive Safeguards Agreement, with many of those strengthened by an Additional Protocol, and many countries with small amounts of nuclear material now have new Small Quantities Protocols fit for today’s circumstances.

These frameworks are not only global, some near-universal, in scope, but they have stood the test of time. This year marks two notable anniversaries; the 50th anniversary of the conclusion of the first Comprehensive Safeguards Agreement in connection with the NPT, and the 25th anniversary of the approval by the IAEA Board of Governors of the Model

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Additional Protocol....

Proliferation Tendencies, Past and Present:

...History has taught us valuable lessons and the current geostrategic consideration of nations show clearly that proliferation tendencies continue to pose a serious challenge. Let me start in 1990. The main lesson of the first Gulf War was that while the Agency was dutifully safeguarding all of Iraq’s *declared* nuclear programme, which was peaceful, it was unaware of Iraq’s *undeclared* nuclear programme, which turned

out to be far from peaceful... IAEA Member States sought to put things right by strengthening the safeguards system. This manifested itself most significantly through the development of a model additional protocol. This protocol complements the comprehensive safeguards agreement to which all non-nuclear weapon states must agree by virtue of being party to the NPT... the Additional Protocol is voluntary and not all States have signed on yet....

In May 1992, the DPRK submitted its initial declaration to the IAEA under its Safeguards Agreement, and inspections began. The IAEA was unable to verify that the DPRK had not diverted nuclear material from its civil programme and questioned the DPRK about certain aspects of its nuclear programme. It proved to have been a decisive finding; subsequently the DPRK developed a nuclear weapon programme and carried out its first nuclear test in October 2006....

In the mid-1990s, South Africa revealed it had developed six nuclear explosive devices in a clandestine weapons programme. At the time it had not been a party to the NPT. The dismantling of the weapons enabled South Africa to join the NPT and reach a safeguards agreement with the IAEA.... Latin America and the Caribbean, under the Treaty of Tlatelolco, is a nuclear weapons free zone and another example of how the exclusively peaceful use of nuclear energy can contribute to the peace and prosperity of hundreds of millions of people.

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Libya revealed in 2003 that it had a latent nuclear weapons programme that it had concealed from the IAEA. Perhaps affected by what had just occurred in Iraq, Libya voluntarily accepted the disarmament of this capability.... This brings me to Iran. It is now 20 years since it was revealed that Iran – unbeknownst to the IAEA and despite having a Comprehensive Safeguards Agreement - was constructing a uranium enrichment facility and a heavy water facility inside the country.... What remains constant is that the Agency is the ultimate guarantor of any agreement and that without the IAEA's participation any agreement is unverifiable.

Eventually in 2015, the JCPOA was negotiated between Iran and the P5 plus Germany.... Prior to the JCPOA taking effect, the IAEA reported its assessment that Iran had conducted a range of activities relevant to the development of a nuclear explosive device as a coordinated effort before the end of 2003. Following this report, the way was opened for the JCPOA to move ahead. The US withdrew from the JCPOA in May 2018. In response, one year later, step by step, Iran began to abandon all its nuclear-related commitments under the deal. Its stockpile of enriched uranium rose significantly; it enriched up to 20% U-235 and then to

The recalibrations of risk are driven by forces out of the IAEA's control, but States have more agency over them. These forces, include verbal threats of actually using nuclear weapons first rather than relying solely on deterrence, thereby weakening the long-held 'nuclear taboo'; aggression by Nuclear Weapon States against Non-nuclear Weapon States that raises questions about whether nuclear weapons deter aggression or facilitate it; and the slow pace of disarmament, leading to disillusionment with the NPT. They all indirectly increase the danger of nuclear proliferation...

60% - the only State without nuclear weapons to enrich to such a level; it developed more sophisticated centrifuges; and, most recently, it asked us to remove our JCPOA-related surveillance cameras. The Agency is seeking explanations concerning the discovery of man-made uranium

particles at three undeclared locations in Iran. This indicates the presence of nuclear material and activities that Iran has failed to explain credibly.

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questions about whether nuclear weapons deter aggression or facilitate it; and the slow pace of disarmament, leading to disillusionment with the NPT. They all indirectly increase the danger of nuclear proliferation.... The IAEA must be able to provide assurances such activities remain within the remit of that States' safeguards obligations, in other words, that nuclear material used in the context of AUKUS will not be used for purposes other than naval propulsion....

Security and Safety: Though nuclear energy, on average, is safer than any other energy source except solar power, the potential severity of an accident requires a strong framework and universal implementation. The IAEA plays a central role in both. It not only develops international safety standards but was crucial in creating a global safety-first culture after the 1986 accident at the Chernobyl Nuclear Power Plant, and in assisting Member States to implement it more fully following the accident at the Daiichi Nuclear Power Station in Fukushima. One example are the IAEA's peer reviews, which facilitate cross-border assessments of nuclear

power programmes. Today, the Agency is reviewing and making transparent to the wider international community Japan's handling of the ALPS-treated water at the Fukushima Daiichi Nuclear Power Station....

Military action has compromised the safety of radiation sources; destroyed infrastructure at Ukraine's Neutron Source and other nuclear facilities; damaged waste repositories; threatened collateral damage at nuclear power plants, and has negatively impacted Chernobyl NPP and Exclusion Zone, and Zaporizhzhya NPP, and their staff, in multiple ways.

highest level of alert for the first time since the 2011 Fukushima Daiichi accident. Military action has compromised the safety of radiation sources; destroyed infrastructure at Ukraine's Neutron Source and other nuclear facilities; damaged waste repositories; threatened collateral damage at nuclear power plants, and has negatively impacted Chernobyl NPP and Exclusion Zone, and Zaporizhzhya NPP, and their staff, in multiple ways.

Nuclear power has been, is, and will be, indispensable to avoiding emissions that not only cause climate change, but also air pollution responsible for up to 8 million deaths a year. In the last five decades, nuclear has avoided the release of about 70 giga-tonnes of greenhouse gases. That's equivalent to the emissions from the entire global power sector for every year between 2015 and 2019. Today, about 440 nuclear reactors worldwide, provide more than a quarter of the world's clean power.

Amidst these events, our missions to Ukraine, one to South Ukraine NPP and one to Chernobyl NPP and Exclusion Zone, accomplished real progress...

The Climate and Energy Crises and Nuclear Energy: The war in Ukraine is happening as the world grapples with two major crises, the climate and the energy crisis. Nuclear power has been, is, and will be, indispensable to avoiding emissions that not only cause climate change, but also air pollution responsible for up to 8 million deaths a year. In the last five decades, nuclear has avoided the release of about 70 giga-tonnes of

Ukraine: The situation among Ukraine's nuclear power plants took a very serious turn on the night between the third and fourth of March when the physical integrity of the Zaporizhzhya Nuclear Power Plant was violated, and a fire broke out at the nuclear facility. The IEC immediately went to the

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greenhouse gases. That's equivalent to the emissions from the entire global power sector for every year between 2015 and 2019. Today, about 440 nuclear reactors worldwide, provide more than a quarter of the world's clean power.... IEA says nuclear capacity will need to double by 2050 to achieve climate goals....

At COP26 in Glasgow, it was becoming absolutely clear the transition to green energy would be very disruptive without the reliability of nuclear power. Nuclear power provides a baseload of energy to solar and wind when the sun doesn't shine and the wind doesn't blow. Meanwhile, about 30 newcomer countries are either planning or considering nuclear power plants. In Asia, some 34 reactors are currently under construction – more than twice the 15 being built in Europe – and scores more are in the proposal stage. China and India have both announced ambitious plans to scale up their nuclear power programmes in the coming years. The conversation in Japan, a little more than a decade removed from the Fukushima Daiichi accident, seems increasingly open to restarting idled reactors. Not only is Asia building more reactors it is also building them fast and often without the delays suffered elsewhere. The China General Nuclear Power Group started work on its two EPRs in Taishan, in southern China, after construction was already under way at two European nuclear power plants, Olkiluoto and Flamanville. China finished by 2019, Europe's plants are still delayed.

As nuclear power plant construction booms in Asia, it will influence the geopolitics of energy and redraw energy relationships in the region. China and Russia are the major builders of nuclear power plants at home, and particularly in the case of Russia, also abroad. France, the US, the UK, Japan and South Korea also build nuclear power plants. Australia, as the third largest producer of uranium and the country with the largest identified reserves, will likely continue to play a role in the global future of nuclear power.

Sustainable Development: Nuclear science and technology directly contribute to more than half the UN's Sustainable Development Goals and the work of widening access to them is an integral

part of the IAEA's mandate. The Agency is also the only institution the NPT names with regards to the fulfilment of this part of the treaty's remit.... From addressing climate change to stopping nuclear proliferation, peace requires multiple approaches and can only be achieved when we work on a global scale. Today, more than ever, the IAEA plays an indispensable part.

Source: <https://www.iaea.org/newscenter/statements/lecture-by-the-director-general-at-the-coral-bell-school-of-asia-pacific-affairs-anu-college-of-asia-the-pacific>, 05 July 2022.

OPINION – Prakash Menon

India can Play Bigger Role in Global Nuclear Politics. Ukraine Fence-Sitting Stands in Way

In war, strategic contestation may not easily knuckle under the passing winds of tactical successes and defeats. The problem is always about judging the flow so that informed decisions can be made on how much and in what manner should force be applied. The Russians have used artillery and missile firepower to devastate Ukrainian resistance and taken control of nearly the entire Donbas region. An uneasy tactical pause is occupying the stage and the contours of a protracted conflict are discernible. It is high time that the international community took a stand on this issue. And India can take the lead in attempts aimed to preserve global peace.

The Threat of a Full-Blown Nuclear War:

Superficially, Russia's military gains have reduced the probability of the use of nuclear weapons, though the threat to use them endures as long as the NATO provides political and strategic support to Ukraine. The latent threat of nuclear weapon use should not be taken lightly even if it is perceived as being of a very low probability. Resting on the shoulders of a conventional war, perceptions of success, setback and defeat by either side harbours the seeds of bringing nuclear weapons into play. Ukraine has no nuclear weapons and it is highly unlikely that NATO would use nuclear arms to defend it. But on the other hand, what should be NATO's response to Russia's nuclear threats and also its actual use? There are

no easy answers for NATO. All actions ranging from joining the conventional war to nuclear retaliation and even actions limited to formal protests and intensified economic sanctions promise no happy endings for the parties concerned and the international community.

Joining the routes of conventional war or nuclear retaliation are both paved with the dangers of escalation to an unimaginable nuclear exchange that can threaten the survival of humanity itself. Though the theory of Nuclear Winter

remains unrecognised by the United States and Russia, its scientific truism remains. The truth is that this theory had sounded the death knell for a nuclear strategy based on massive nuclear blows, as the long-term environmental consequences could turn out to be suicidal—not only for the parties concerned but also for humanity

India Must Take the Lead: The international community has to raise its voice and call for an immediate cessation of war in Ukraine. It certainly cannot be silent in the wake of great power politics posing threats to global peace and at its worst, an existential threat to humanity. India should take the lead as it is in an advantageous position. India's nuanced foreign policy has attempted to evade the image of belonging to power blocs. However, India's relations with China are fraught and its recovery hinges on New Delhi's orientation in global power politics.

Ideally, for India, its relations with the US and China should be better than what they have among themselves. Whatever the dimensions of this relational structure, it can allow India to lead the world as a third force in global power politics. This grouping must seek the stoppage of use of

force in violation of agreed international norms and represent the voice of peace. It should call for Russia and NATO to undertake a No First Use of nuclear weapons policy in the context of the Ukraine War as an immediate measure. Such a step should be followed by a call for a Global No First Use pledge by all nuclear powers.

In sheer quantity, the number of nations that lend their voices to such a movement could be large enough to represent a force that can make a difference in the ongoing global power struggle. Such a force

actually exists in the form of the NAM though it has been comatose in its main area of interest – global peace. The reason for inaction was because of the disunity within the movement. India should lead the call for dealing with disunity. A call for reawakening Non-Alignment has already been given by India's former NSA, Shivshankar Menon, through an article in Foreign Affairs magazine. India's officialdom should seriously examine the idea... Global geopolitical threats can affect

India's developmental progress. Lost time can never be recovered. It is time for a wake-up call to crystallise India's role in global politics.

Source-<https://theprint.in/opinion/india-can-play-bigger-role-in-global-nuclear-politics-ukraine-fence-sitting-stands-in-way/1034079/>, 12 July 2022.

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OPINION – Hal Brands

Keeping Putin's Nuclear Threat from Launching an Arms Race

Ukraine may seem a cautionary tale for nations lacking atomic weapons, but the US has the ability to keep most other states from obtaining them. The war in Ukraine has shattered the stability of Eastern Europe. It is also straining one of the great

American and global achievements of the postwar era: A system that kept the club of nuclear-weapon states small and exclusive. As a report published by the Brookings Institution put it, One “potential casualty of this conflict is the NPT and the general international effort to prevent the spread of nuclear weapons.” Indeed, the nonproliferation regime looks shakier than it has in decades. It can probably still be held together — but that will depend heavily on how the US addresses not just the Ukraine war but a larger set of rivalries and tensions around the globe.

In a 1960 presidential debate, Kennedy warned ominously that perhaps 20 countries could have nuclear weapons within a half-decade. Three generations later, the number is only nine. American leaders have long believed that US influence and security would be imperilled by nuclear anarchy. So they worked hard to make Kennedy’s fear of rampant proliferation a self-denying prophecy. Washington employed both carrots and sticks to dissuade states from going nuclear.

It created, with the cooperation of the Soviet Union, a formal nonproliferation treaty in 1968. It provided security guarantees to anxious allies that might otherwise seek the bomb. It used diplomatic threats, economic sanctions and other coercive measures against countries — both adversaries and allies — that had started down the nuclear path. Nonproliferation, Francis Gavin, is one of America’s most consistent and effective policies of the post-war era.

That success seems tenuous today. Iran’s nuclear program is advancing and talks on reviving the 2015 agreement to restrain it are stalled; Saudi Arabia has promised to build the bomb if Iran does so. China’s nuclear buildup and threats are causing nervousness in East Asia, a feeling reinforced by nagging doubts about America’s long-term reliability. Now comes the war in

Ukraine. What better reminder could there be that nuclear weapons — which Ukraine gave up in the 1990s — constitute excellent insurance against aggression?

President Putin has issued nuclear threats to deter the NATO from intervening on Ukraine’s behalf, further promoting the view that those with nukes do what they will and those without them suffer what they must. What does this mean for global nonproliferation?

In Europe, the situation could easily be much worse than it is. Had Russia quickly conquered Ukraine, and the US simply acquiesced in that

Had Russia quickly conquered Ukraine, and the US simply acquiesced in that outcome, exposed states such as Poland would surely be mulling the nuclear option. Yet by helping Ukraine withstand the onslaught, and by quickly strengthening NATO’s eastern front, Washington and key allies such as the UK limited the danger of nuclear dominoes falling in Europe.

outcome, exposed states such as Poland would surely be mulling the nuclear option. Yet by helping Ukraine withstand the onslaught, and by quickly strengthening NATO’s eastern front, Washington and key allies such as the UK limited the danger of nuclear dominoes falling in Europe. Since 1945, the best ways to avoid being bullied have been to build the

bomb or build a close alliance with the US. As long as frontline NATO states can count on the latter — and as long as they believe that Russian nuclear threats will not prevent the US from opposing conventional aggression against its allies — they can probably do without the former.

For Ukraine itself, the situation is more complicated, because a country that has suffered so much has little hope of joining NATO anytime soon. But Ukraine faces important technical limitations in building nuclear weapons. And because it depends on Western money and arms, it can probably be dissuaded from trying — as long as it believes that Washington is committed to its survival and fears that a nuclear program would jeopardize that support.

The situation in the Middle East is also fraught, because Iran’s enemies — principally Saudi Arabia — think that Washington is losing interest in the

region. For diplomatic and technological reasons, Saudi Arabia or other Gulf countries might not automatically emulate Tehran's example; South Korea and Japan didn't go nuclear after North Korea did. But limiting the inevitable proliferation pressures in the region will probably require either a more successful campaign to inhibit Tehran's program, whether through diplomacy or other means, or stronger US guarantees to the Arab states, backed by a continuing US military presence, that an Iranian bomb will not enable Iranian hegemony in the Gulf.

Finally, there is East Asia. Taiwan, another endangered state, probably won't seek nuclear weapons, because doing so would be likely to provoke the Chinese invasion it hopes to avoid. Elsewhere in the region, the US can probably inhibit proliferation through a mix of reassurance measures: greater consultation with allies on nuclear strategy; discussions of how Washington would respond to a limited Chinese use of nuclear weapons; perhaps stationing nuclear weapons on or near the territory of key allies.

If, however, China manages to subdue Taiwan through coercion or aggression, while the US stands on the sidelines, then all bets are off. The region's most technologically sophisticated states, Japan and South Korea, easily could, and probably would, move to assure their defense against nuclear-armed adversaries by developing their own nuclear capabilities in relatively short order. The strength of the nonproliferation regime is intimately related to the stability of the larger international order. If that stability gives way, America's remarkable nonproliferation successes could quickly follow.

Source-<https://www.bloomberg.com/opinion/articles/2022-07-11/ukraine-war-keep-putin-s-nuclear-threat-from-launching-global-arms-race>, 11 July 2022.

OPINION – Robert Bryce

Soaring Demand for Electricity and Coal Shows Why We Need Nuclear Energy

...BP released its annual Statistical Review of World Energy and the report shows, yet again,

that electricity is the world's most important and fastest-growing form of energy. In 2021, global electricity generation grew by a record 1,577 terawatt-hours, an increase of 6.2 percent over 2020. For perspective, last year's increase in electricity production was greater than the electricity output of France, Germany and Britain combined. The surge in electricity generation — nearly half of which happened in China — reflects the jump in demand for power as the world recovers from the COVID-19 pandemic.

The numbers also show that, despite all the hype about renewable energy and the "energy transition," when it comes to producing power, countries are still heavily dependent on King Coal. Indeed, coal-fired generation continued its dominance of the electricity sector in 2021, accounting for 51 percent of the increase in global electricity generation. Furthermore, coal's share in the global generation mix increased slightly to 36 percent, while natural gas's share of the generation mix fell to just under 23 percent. While renewable generation increased by double-digit percentages, the increase in coal-fired generation — up 805 terawatt-hours — was greater than the jump in wind and solar production combined. Not surprisingly, China had the biggest share of the increase in coal use, accounting for more than half of the global increase of 418 terawatt-hours. By itself, China accounts for 54 percent of all global coal use.

But China is only part of the story. Coal-fired generation also increased in the United States last year, up 122 terawatt-hours, and in India, up 152 terawatt-hours. The surge in coal consumption shows that what I call the "Iron Law of Electricity" remains in effect — that countries, businesses and individuals will do what they have to do to get the electricity they need. China and India usually get the headlines, but European countries also are ramping up coal use. Russia's restrictions on westward flows of natural gas have spurred Germany, the Netherlands, Austria and Poland to increase their coal use. All of these numbers matter because the electricity sector produces more greenhouse gasses than any other sector of the global economy. And because the global

electricity business is so dependent on coal, there is simply no way to cut emissions without making a big dent in coal consumption.

Again, the BP numbers tell the tale. In 2021, the jump in coal use — which surged by 6.3 percent — was greater than the growth in global oil use (up 6.1 percent), natural gas consumption (up 5.3 percent), nuclear (up 3.8 percent), or hydro (down 1.8 percent). The surge in hydrocarbon consumption also explains why global greenhouse gas emissions continue climbing. Last year, global CO2 emissions increased by 5.9 percent. Here in the U.S., emissions increased even more than that, climbing by 6.6 percent.

Despite these facts, academics, policymakers and climate activists routinely claim that we don't need hydrocarbons and that we can meet the world's energy needs solely with renewables — wind, solar and a dash of hydropower — an idea debunked in a 2017 report published by the National Academy of Sciences.

Don't buy the hype. The reality is that all around the world, land-use conflicts are slowing or stopping large-scale wind and solar projects. As can be seen in the Renewable Rejection Database, some 344 communities across the U.S. have rejected or restricted wind projects since 2013. To cite just one recent example: Last month, Butler County, Ohio, banned large wind and solar projects in a dozen townships in the county. The rural backlash against the energy sprawl that comes with big renewable projects also has occurred in Europe. In 2010, the European

Platform Against Windfarms had about 400 member organizations. Today, it has more than 1,600 members in 31 countries.

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It said that "advanced economies have lost market leadership" in nuclear development and deployment and that "27 out of 31 reactors that started construction since 2017 are Russian or Chinese designs." This must change. For decades, the U.S. led the world in the development of nuclear energy. But we have ceded that leadership to Russia and China.

There are many reasons why renewables cannot — will not — be able to meet soaring global energy demand. They include intermittency, land constraints, lack of sufficient high-voltage transmission capacity, and the staggering quantity of commodities such as concrete, copper, steel and rare earth elements that would be needed. So, if renewables cannot meet our needs, and we are

concerned about climate change, what is the way forward? The answer is nuclear energy. Indeed, the big energy news was a report from the IEA, which said that "building sustainable and clean energy systems will be harder, riskier and more expensive without nuclear," and that global nuclear capacity must double between now and 2050 if the world is to have any hope of slashing emissions.

The IEA also underscored the lack of progress being made in the U.S. and Europe on building new reactors. It said that "advanced economies have lost market leadership" in nuclear development and deployment and that "27 out of 31 reactors that started construction since 2017 are Russian or Chinese designs." This must change. For decades, the U.S. led the world in the development of nuclear energy. But we have ceded that leadership to Russia and China. Furthermore, the U.S. has foolishly allowed too many of our existing nuclear plants to be prematurely shuttered, including two in the past 15 months: Indian Point in New York and Palisades in Michigan.

The energy crisis in Europe and the latest BP numbers show that if we are to have any hope of reducing greenhouse gas emissions, we have to embrace the atom. The U.S. doesn't lack investment dollars or good reactor designs. Last year alone, some \$3.4 billion in venture capital was invested in nuclear-focused startups. What's needed is committed and sustained leadership from President Biden and Congress. Today's crises are a prime opportunity for President Biden to use the bully pulpit to promote nuclear energy. And the time for him to do so is right now.

Source-<https://thehill.com/opinion/energy-environment/3548160-soaring-demand-for-electricity-and-coal-shows-why-we-need-nuclear-energy/>, 07 July 2022.

OPINION – Editorial, *The Hindu*

Deal or No Deal? On U.S.-Iran Direct Talks on Nuclear Deal

Reviving the Iran nuclear deal was a campaign promise of U.S. President Biden. In the White House, Biden appointed a special envoy for Iran, starting indirect negotiations with the country and direct talks with other signatories of the 2015 agreement to meet this objective. But almost one and a half years later, there has still been no breakthrough in one of the most contentious issues he faces in West Asia. Multiple rounds of talks in Vienna made progress in bringing the deal back on track, which had sought to scuttle Iran's nuclear programme in return for lifting international sanctions.

But the talks collapsed earlier this year as the Biden administration reportedly refused to remove the terrorist designation of the Islamic Revolutionary

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Guard Corps (IRGC), a critical arm of Iran's armed forces. Qatar, which hosted the U.S.-Taliban talks that led to the February 2020 agreement between the Afghan Sunni fundamentalist insurgency and the Trump administration, held indirect talks between the U.S. and Iran. However, as Biden prepares for his first West Asia tour as U.S. President later this month, a deal is still elusive. While Iran says the Doha talks were positive, U.S. officials

say the prospects of reviving the agreement are now worse. That they stay engaged in talks shows that both sides are still keen on a solution, but they face structural impediments.

To be sure, the current mess was created by Donald Trump. The Obama administration and the Rouhani presidency, along with other world powers, had engaged in painstaking negotiations to reach the 2015 agreement, which practically cut off Iran's path towards building nuclear capabilities. Iran was fully compliant with the agreement's terms when President Trump unilaterally pulled the U.S. out of the agreement. He had hoped that Iran, under economic pressure, would renegotiate the agreement. Instead, Iran began enriching large amounts of uranium to a higher purity and developing advanced centrifuges, besides strengthening its military presence in the region through its proxies.

Biden, like Obama, also sees a negotiated agreement as the best way to limit Iran's nuclear programme. But he is facing pressure from America's allies in West Asia, especially Israel, to include Iran's weapons programme in the ambit of a fresh agreement. Iran is strongly resisting any attempt to expand the scope of the agreement.

As Biden prepares for his first West Asia tour as U.S. President later this month, a deal is still elusive. While Iran says the Doha talks were positive, U.S. officials say the prospects of reviving the agreement are now worse. That they stay engaged in talks shows that both sides are still keen on a solution, but they face structural impediments.

As negotiations go on, Israel has stepped up its shadow war with the Islamic Republic, targeting its military and nuclear personnel and weapons facilities. This is a dangerous slope. What the world wants now, at a time when it is struggling with the after-effects of Russia's illegal invasion of Ukraine, is not another open conflict. The U.S. and Iran should start direct negotiations to overcome differences and find common ground on the deal before it is too late.

Source - <https://www.thehindu.com/opinion/editorial/deal-or-no-deal-on-us-iran-direct-talks-on-nuclear-deal/article65599485.ece>, 05 July 2022.

OPINION – Joseph S. Nye Jr.

After Russia's Invasion of Ukraine, We Need to Strengthen Nuclear Non-proliferation Efforts

When the Soviet Union collapsed in 1991, Ukraine inherited part of its nuclear arsenal. But in the 1994 Budapest Memorandum, Ukraine agreed to return these weapons to Russia in exchange for "assurances" from Russia, Britain, and the United States that its sovereignty and borders would be respected. Russia brazenly violated this promise when it annexed Crimea in 2014, and tore up the Memorandum with its full-scale invasion of Ukraine on February 24. Many observers have concluded that Ukraine made a fateful mistake by agreeing to surrender its nuclear arsenal. Are they right?

In the early 1960s, U.S. president John F. Kennedy predicted that at least 25 states would have nuclear weapons by the following decade. But in 1968, United Nations member states agreed to a non-proliferation treaty that restricted nuclear weapons to the five states that already had them (the U.S., the Soviet Union, Britain, France, and

China). Today, just nine states have them – the five named in treaty signatories plus Israel, India, Pakistan, and North Korea – but there are more "threshold states" (countries with the technological ability to build nuclear weapons quickly) considering the option.

Some analysts suggest that proliferation might be a good thing, because a world of nuclear-armed porcupines would be more stable than a world of

nuclear wolves and unarmed rabbits. In their view, Russia would not have dared to invade a nuclear-armed Ukraine. Moreover, they question why some states should have a right to nuclear weapons while others do not. Others advocate the abolition of all nuclear weapons, a goal enshrined in the 2017 UN Treaty on the Prohibition of Nuclear Weapons, which entered into force in 2021. It currently has 86 signatories and 66 parties (though none of the nine states with nuclear weapons have signed up). Skeptics of this approach argue that while nuclear abolition may

be a worthy long-term aspiration, efforts to get there too quickly could increase instability and the likelihood of conflict. The real ethical challenge, they maintain, is not nuclear weapons' existence but the probability of their use. The

Russian invasion of Ukraine is so damaging because not only has Russia violated its explicit security guarantee under the Budapest Memorandum; it has also hinted at nuclear escalation to deter others from coming to Ukraine's aid. It is thus weakening the taboo against treating nuclear weapons as normal war-fighting weapons – a convention that the Nobel Laureate economist Thomas Schelling called the most important global norm since 1945.

But it would be a mistake to exaggerate the harm that the invasion of Ukraine has done to the non-proliferation regime. For one thing, those who

Others advocate the abolition of all nuclear weapons, a goal enshrined in the 2017 UN Treaty on the Prohibition of Nuclear Weapons, which entered into force in 2021. It currently has 86 signatories and 66 parties.

The Russian invasion of Ukraine is so damaging because not only has Russia violated its explicit security guarantee under the Budapest Memorandum; it has also hinted at nuclear escalation to deter others from coming to Ukraine's aid.

think the invasion will teach other states that they would be more secure if they had nuclear weapons are oversimplifying history. One cannot assume that nothing would have happened if Ukraine had kept its Soviet-era nuclear weapons. After all, such weapons do not come ready to use “off the shelf.” The fissile material in the long-range Soviet missiles stationed in Ukraine would have had to be removed, reshaped, and repurposed. Not only would that have taken time and expertise, but it might have accelerated Russia’s intervention. When states approach the nuclear threshold, they enter a “valley of vulnerability” that may reduce their security and increase general instability. Even when stable deterrence is imaginable in a region, it may be highly risky to try to get from here to there.

Some theorists argue that just as nuclear of the military, the security of communications, and weapons-control protocols. If new proliferators have a higher risk of using nuclear weapons – even if inadvertently – they and their neighbours will become even more insecure in the “valley of vulnerability.” Ultimately, when nuclear weapons proliferate, the chances of inadvertent or accidental use tend to increase, managing potential nuclear crises becomes more complicated, and establishing controls that may someday help to reduce the role of nuclear weapons in world politics becomes more difficult. In short, the greater the spread of supposedly defensive weapons, the higher the risks of blowing up the whole neighbourhood. The real lesson from Russia’s war in Ukraine is that we must reinforce the existing NPT and refrain from actions that erode it.

Source: <https://www.theglobeandmail.com/opinion/article-after-russias-invasion-of-the-ukraine-we-need-to-strengthen-nuclear/>, 08 July 2022.

OPINION – Lee Baek-Soon

Is Seoul Any Safer than Paris?

In short, the greater the spread of supposedly defensive weapons, the higher the risks of blowing up the whole neighbourhood. The real lesson from Russia’s war in Ukraine is that we must reinforce the existing NPT and refrain from actions that erode it.

In 2017, North Korea fired the Hwasong-14 inter-continental ballistic missile with a range of 12,000 km (7,456 miles), openly demonstrating it could hit the West Coast of the United States. This year, the North resumed missile provocations. Its Hwasong-15 and 17 missiles showed that the recalcitrant state is capable of attacking eastern cities such as Washington D.C. and New York City. Furthermore, North Korea is expected to conduct a seventh nuclear test and miniaturize and diversify its atomic weapons. The country appears to have already completed the miniaturization stage; it is heading toward the final stage of deploying tactical nuclear weapons by going through the diversification process.

On April 10, Kim Jong-un said the country will use nuclear weapons “preemptively and thoroughly to contain and frustrate all dangerous attempts and threatening moves, including ever-escalating nuclear threats from hostile forces, if necessary.” Since it left the NPT in March 1993, North Korea has consistently developed nuclear weapons over the past 30 years. At first, the country pretended that nuclear development was a means for negotiation to win what it wants.

What’s more worrisome is the North’s doctrine of preemptive use of nuclear weapons. At a military parade marking the 90th anniversary of the North Korean military on April 10, Kim Jong-un said the country will use nuclear weapons

“preemptively and thoroughly to contain and frustrate all dangerous attempts and threatening moves, including ever-escalating nuclear threats from hostile forces, if necessary.”

Since it left the NPT in March 1993, North Korea has consistently developed nuclear weapons over the past 30 years. At first, the country pretended that nuclear development was a means for negotiation

to win what it wants. Later, Pyongyang claimed that it was a self-defense measure against U.S. threats. But with its latest declaration of a preemptive nuclear usage doctrine, it announced publicly that its nukes are intended for attacks. As a result, South Korea faces its worst nightmare.

As South Korea already experienced various types of threats from North Korea, it is inured to the North's nuclear threats. It is worrisome to see some people accept North Korea's propaganda that the nuclear weapons are mutual assets of the Korean people and that Pyongyang has no intention to use them against the Korean people.

We must take the doctrine seriously. The biggest reason is that North Korea now possesses the means to block the U.S. nuclear umbrella. South Korea must rely on the U.S. nuclear umbrella to resist North Korea's attacks using conventional weapons or threats to use tactical weapons. But the reliability of this nuclear umbrella is in question as North Korea possesses intercontinental ballistic missiles capable of striking the U.S. mainland.

We want to believe that the U.S. nuclear umbrella is functioning properly, but Seoul and Washington have yet to complete the process to specify the mechanism of unfolding the nuclear umbrella.

It is an issue to be resolved through Korea-U.S. high-level extended deterrence consultation, which was agreed to at the Korea-U.S. summit in May. North Korea appeared to have the ability to launch secondary attacks by mass producing intercontinental ballistic missiles. Under these circumstances, we have to ask ourselves a fundamental question: Will the United States help South Korea despite the risks of Washington and New York being exposed to nuclear attacks? During the presidency of Charles de Gaulle, France was uncertain about whether Paris would be protected by Uncle Sam, and the country launched a process

to arm itself with nukes. Some express optimism that North Korea will not undertake a preemptive strike as it knows it will face total destruction by retaliations from South Korea and the U.S.

But others contend that Kim Jong-un will use the logic of asymmetric expansion of war and preemptively use nuclear weapons with some limits, if he is really cool-headed and rational. If South Korea and America are ready to start a preemptive strike in times of crisis, North Korea will conclude that it will be advantageous to preemptively use its nuclear weapons to stop it. That will help the North escape from the dilemma of "use-it or lose-it."

For example, it will first stage a provocation against the South. And then, in order to stop the operation of the U.S. nuclear umbrella, North Korea will strike U.S. bases in Guam, from where its strategic assets and reinforcements will be deployed. If North Korea faces a retaliatory attack from America, it will threaten to use its intercontinental ballistic missiles to attack major cities on the East Coast. In this case, more residents of

Pyongyang are likely to survive the attacks because the city has more defense mechanisms than New York or Washington D.C. Unless there is a guarantee that America will use its nuclear umbrella against a North Korean aggression, South Korea will be left with almost no choice before a nuclear-armed North Korea.

The Yoon Suk-yeol administration must quickly come up with substantial measures to deter the North's nuclear treats. No matter what it takes to defend our country against the North's doctrine of preemptive use of nuclear weapons, we must pay for it. We must walk on a path with this determination.

Source: <https://koreajoongangdaily.joins.com/2022/07/12/opinion/columns/North-Korea-nuclear-umbrella-ICBM/20220712195236005.html>, 12 July 2022.

Will the United States help South Korea despite the risks of Washington and New York being exposed to nuclear attacks? During the presidency of Charles de Gaulle, France was uncertain about whether Paris would be protected by Uncle Sam, and the country launched a process to arm itself with nukes. Some express optimism that North Korea will not undertake a preemptive strike as it knows it will face total destruction by retaliations from South Korea and the U.S.

NUCLEAR STRATEGY

AUSTRALIA

Australia Developing New Defense Strategy in Response to China, Says Deputy Prime Minister

Australia is developing long-range strike weapons, remains intent on building a nuclear-powered submarine force and is ramping up its area access denial capabilities in cooperation with the United States as it watches China “trying to shape the world around us” its deputy prime minister said.

Marles, who also serves as defense minister, said Canberra’s defense posture and force structure reviews for the government that took office this spring are expected to be delivered early next year.

While not formal national security white papers, they will answer key questions of “where we’re at” and “where we need to go,” he said. “We worry about the use of force” by China in the South China Sea and also by Russia in its invasion of Ukraine as direct attacks on the established rules of order that prizes dialogue over military action, Marles said at the Center for Strategic and International Studies. In this changed security environment great powers like Beijing and Moscow expect weaker neighbors to act as vassals or be considered as enemies, he added. Allies such as Australia and the US “cannot afford to stand still” as these threats grows, he said....

Source- <https://news.usni.org/2022/07/12/australia-developing-new-defense-strategy-in-response-to-china-says-deputy-prime-minister>, 12 July 2022.

Australia is developing long-range strike weapons, remains intent on building a nuclear-powered submarine force and is ramping up its area access denial capabilities in cooperation with the United States as it watches China “trying to shape the world around us.”

South Korea’s “three-axis” defense system is designed to counter North Korea’s evolving nuclear and missile threats. It consists of three key strategies: the Kill Chain preemptive strike system, the Korea Air and Missile Defense system for shooting down missiles, and the Korea Massive Punishment and Retaliation plan.

SOUTH KOREA

S. Korea to Create ‘Three-Axis’ Defense System Strategic Command

The South Korean Ministry of National Defense said it would establish a new strategic command responsible for implementing and overseeing the

country’s so-called “three-axis” defense system. The development comes amid international concern that North Korea is preparing to conduct another nuclear weapons test. The new command will reportedly be capable of utilizing weapons from all

three branches of the South Korean military to bolster the nation’s defensive and offensive capabilities. The ministry plans to establish the new body in 2024, with specific missions and functions formulated as early as next year. Once created, the strategic command is expected to

oversee the operations of South Korea’s existing and future military assets, which include F-35A combat jets, missile interceptors, ballistic missiles, and reconnaissance satellites.

The Three-Axis System: South Korea’s “three-axis” defense system is designed to counter North Korea’s evolving nuclear and missile

threats. It consists of three key strategies: the Kill Chain preemptive strike system, the Korea Air and Missile Defense system for shooting down missiles, and the Korea Massive Punishment and Retaliation plan. Under the current system, military assets critical to the “three-axis” strategy are commanded by different military branches, with each service issuing separate orders for the weapons to operate. The new strategic command will reportedly enable smoother execution of the three-axis response system and allow for a more effective combination of weapons against North Korean threats.

Source-<https://www.thedefensepost.com/2022/07/07/south-korea-defense-system/>, 07 July 2022.

EMERGING TECHNOLOGIES AND DETERRENCE

SOUTH KOREA

Frequent Deployment of Strategic Assets to Counter Deterrence Effects

A frequent dispatch of U.S. strategic assets to the Korean Peninsula as part of its efforts to deter North Korea's growing nuclear threats is not a good idea amid rampant speculation that the regime's nuclear test is imminent, according to a diplomatic observer.

Strategic assets refer to long-range bombers, nuclear-powered submarines or aircraft carriers. However, Kim Jung-sub, a senior research fellow at the Sejong Institute, said "The deployment of U.S. strategic assets such as the B-52 bomber, B-1B bomber or SSBN is a useful means to send a strong warning to North Korea and a reassurance to the South Korean people." SSBN refers to a nuclear-powered ballistic missile submarine.

But he cautioned that the deployments need to be done with a clear purpose at an appropriate time. "This is because there is a risk that if we use the option excessively, it could counter its effects or unnecessarily heighten military tensions on the peninsula. In particular, when a North Korean nuclear test is expected as it is now, it is advisable to use strategic assets after North Korea conducts it, rather than in advance because if the country carries out a nuclear test despite the deployment of strategic assets, we would waste such an important deterrence means with little effect," Kim added.

The expert also said that South Korea and the

United States should share detailed deterrence plans in times of emergency. "It is not simply the promise of a nuclear umbrella by the United States, but rather, raising the level of extended deterrence to the level of sharing and discussing with the allies what nuclear and non-nuclear options the United States will pursue under what conditions and under what circumstances," he added. Currently, Seoul and Washington are poised to reactivate the regular meetings of the Extended Deterrence Strategy and Consultation Group (EDSCG), one of the two consultative mechanisms to achieve North Korea's denuclearization through steadfast deterrence. The other is the Deterrence Strategy Committee (DSC). But he said the allies should

try to balance both dialogues. "The DSC, held at the defense ministry level, deals with overall issues linked to extended deterrence, while the EDSCG, by the foreign and defense ministries, is focused on delivering messages," Kim said.

Source- https://www.koreatimes.co.kr/www/nation/2022/07/205_332114.html, 07 July 2022.

The Nuclear Regulatory Commission Wants Comments on its Inaugural AI Strategic Plan as More Machine Learning is Introduced into the Field

The Nuclear Regulatory Commission is looking for comments on its first Artificial Intelligence Strategic Plan, set to last from 2023 to 2027 as the agency looks to implement new AI and data science applications into its business processes as well as in external nuclear operations. This is the first document of its kind issued by the NRC, as the agency does not currently have AI technologies in place. "The strategy is aimed to ensure we're ready to review and evaluate the use of AI in NRC-regulated activities," said a NRC staff member. Much of the guidelines' focus will work

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to regulate AI and machine learning-run data science and analysis, as nuclear operations have taken an interest in relying on more autonomous systems to handle work.

Five overarching strategic goals governing the guidelines include: establishing NRC readiness for industry regulation within nuclear operation and AI systems; creating a framework to evaluate the use of AI tools; expanding AI partnerships within the industry; developing an AI-savvy workforce; and developing use cases for AI technology in NRC-sanctioned activities. To evaluate and regulate the use of AI in these operations, officials have classified autonomy levels in a hierarchy detailed in the draft document based on a system's human-machine interaction.

Siphoned into categories ranging from Level 1, with human decision-making at the forefront of operations, and Level 4, with fully autonomous machines handling decisions, regulatory measures overseen by the NRC will vary depending on where a qualifying nuclear initiative falls in this scale. "Higher autonomy levels indicate less reliance on human intervention or oversight and, therefore, may require greater regulatory scrutiny of the AI system," the draft document reads. Some of the public feedback the NRC is looking for is input on overall improvements within the plan, new goals, as well as potential challenges of including AI in nuclear operations. The comment period ends on Aug. 19. This isn't the first time the NRC has waded into asking public opinion of AI in nuclear activity. In 2021, the agency asked for public input on future trends regarding AI in the nuclear field, particularly targeting technology implementation and algorithmic procedures.

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Russia is developing a new "aircraft carrier killer" — ballistic missile Zmeevik with a hypersonic warhead for the Navy. The Zmeevik ballistic missile with hypersonic combat equipment has been in development for quite a long time. It is designed to destroy large surface targets, primarily aircraft carriers.

Source-<https://www.nextgov.com/policy/2022/07/regulatory-agency-issues-first-document-addressing-ai-nuclear-operations/373961/>, 07 July 2022.

BALLISTIC MISSILE DEFENCE

RUSSIA

Russia Develops Zmeevik Anti-Ship Ballistic Missile

Russia is developing a new "aircraft carrier killer" — ballistic missile Zmeevik with a hypersonic warhead for the Navy. The Zmeevik ballistic missile with hypersonic combat equipment has been in development for quite a long time. It is designed to destroy large surface

targets, primarily aircraft carriers. A source said the missile could enter service with coastal missile units of the Navy. One of the sources added that in terms of its characteristics, the Zmeevik resembles Chinese missiles of a similar class — **DF-21D** and **DF-26** with a range of up to 4,000 km.

After the end of the Cold War, the Russian Navy lost its ability to be a "Blue Water Navy" due to the lack of aircraft carrier task forces. Since the Russian Navy's only aircraft carrier, Kuznetsov, has been under maintenance for several years and has suffered serious accidents, Russia doesn't appear to have a solid carrier battle group in the near future.

Although the Slava-class cruisers are configured to destroy aircraft carriers with the P-1000 Vulcan missiles they carry, the Moskva incident during the Russo-Ukrainian War exposed the weaknesses of these ships even against powerful subsonic missiles.

Tsirkon missiles can be considered a deterrent because the U.S. hasn't been able to develop a solid defence system against hypersonic missiles. Zmeevik, a land-based hypersonic long-range missile, will be a solid capability and a complementary force to enhance Russia's A2/AD until the U.S. and its allies gain the ability to counter hypersonic missiles. Both the U.S. (with the **Glide Phase Interceptor** or GPI) and Europe (with the **TWISTER project**) have ongoing projects to gain the capability to counter such threats, which aren't fully proven anyway (including Tsirkon).

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Source: <https://www.navalnews.com/naval-news/2022/07/russia-develops-zmeevik-anti-ship-ballistic-missile/>, 13 July 2022.

UKRAINE

Ukraine 'Tears Down' Israel's Iron Dome Systems; Says they are Incapable Against Russian Missiles

Ukraine's President Volodymyr Zelensky condemned Russia's recent attack on the civilian apartments in Donetsk, claiming the airstrikes have continued unabated. However, amid persistent missile attacks, Ukraine's Defense Minister has made shocking remarks about the Israeli Iron Dome missile defense system that Kiev needs to defend itself.

On July 9, Ukraine's Defense Minister Reznikov said the beleaguered country did not need Israel's Iron Dome missile defense system. These remarks depart from Kyiv's previous pleas to supply defensive military

equipment to the Ukrainian armed forces with the Jewish country. On June 7, the ambassador of Ukraine to Israel stated that Kyiv wanted to purchase Israel's Iron Dome missile-defense system to defend civilian women and children from the Russian missiles the Jerusalem Post reported. Ukraine first sought to purchase Iron Dome following the invasion, but the request was not entertained. Israel reportedly blocked a US proposal to deliver Iron Dome missile batteries to Ukraine because it may hurt its relations with Russia. The Iron Dome has a history of success in combat. After the

confrontation between the Israel Defense Force and Palestinian Hamas in Gaza last year, in which these missile systems are believed to have intercepted 90% of rockets fired, Ukraine was the first to express interest in the Iron Dome.

However, in what could be a 360-degree turnaround for the country, the Defense Minister said that the Israeli Iron Dome system could not protect against Russian missiles. Iron Dome was constructed to defend against low-speed, low-impact missiles created in garages. The defense system is ineffective against ballistic and cruise missiles. Reznikov

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claims that although not perfectly, several missiles are already being shot down, protecting the sky over Ukraine, and Russian aircraft are already wary of flying over Ukraine. So, the Russians launched attacks from Belarus, the Russian Federation, the annexed Crimea, the Black Sea, and the Caspian Sea. Ukraine's admonishment of the Iron Dome is

accompanied by its willingness to develop its missile defense system similar to Israel's Iron Dome with the help of a California-based company....

Russia's Barrage of Missiles: Since the war started, Russia has deployed its most sophisticated missiles against Ukraine. It has widely employed its Kalibr cruise missiles to hit targets in Ukraine from its warships and submarines in the black sea, besides the Bastion-P anti-ship missile that it has used to target Ukrainian ground assets. The ground-launched Iskander short-range ballistic missile is another weapon of choice that has been overwhelmingly used by the invading Russian troops, especially in the east of Ukraine. Russia sent Iskander missiles to neighboring Belarus as well. Moscow also used its Kinzhal hypersonic missile against Ukraine on more than one occasion and became the first country to fire a hypersonic weapon in combat.

Some of Russia's deadliest attacks on Ukraine have been carried out using homegrown missiles, including Tochka-U, which hit the Ukrainian port city of Odesa and a train station in the eastern Ukrainian town of Kramatorsk. Russia has deployed several precision-guided missiles against Ukraine, including the Kh-101 and Kh-55 cruise missiles fired from fixed-wing bombers. These missiles are frequently flying over Ukraine as they approach their objectives. However, of late, it has changed its strategy to cause more havoc and use its precision-guided, sophisticated, and expensive missiles more frugally. *EurAsian Times* reported that the Air Force of Ukraine's Armed Forces, observed Russia was skimping on expensive high-precision missiles. The Russian troops used old Soviet Kh-59 and Kh-22 missiles more often.

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It is pertinent to mention these soviet-rockets are not precision-guided but have massive payload capacity and can cause widespread damage, especially in civilian areas. As the war rages on, there is little certainty over the ground. Russia could be expected to rain down missiles on Ukraine, while the latter could be expected to lobby for even better systems to fight the Russian troops. As for Israel, there has been virtually no response on the matter.

Source-<https://eurasianimes.com/ukraine-tears-down-israels-iron-dome-systems-says-they-are-incapable/>, 11 July 2022.

USA

Future US ICBM Vehicle for Mk21A Explodes 11 Seconds after Launch

The Minotaur II+ rocket, which the US will use for the LGM-35 Sentinel ICBM and W87-1 nuclear warhead – the Mk21A, conducted its first test, but it was unsuccessful. Days ago, on July 7th, during the first test at Vandenberg Space Force Base [VSFB], the rocket exploded 11 seconds after launch.

Immediately after the explosion, which was very close to the launch pad, debris fell into the area.

VSFB officials reported no injuries but said the explosion did cause a fire on North Base. A press release from Col. Kris Barcomb, Space Launch Delta 30 vice commander confirms what we know, adding that the base's priority has always been security, and after the incident, emergency teams responded immediately. At the moment, the cause of the explosion is not clear, but the base announced that an investigation had begun. The new US nuclear program includes the phased retirement of 400 Minuteman III ICBM and their replacement with the LGM-35 Sentinel based on the Minotaur

II+e rocket. The launch was scheduled to be the first test supporting the development of the Air Force's new Mk21A reentry vehicle. According to the Pentagon's plans, the new intercontinental ballistic missiles should begin entering the equipment of the US strategic nuclear forces in 2029 to replace the outdated Minuteman III missiles that have been in service since the early 1970s.

The missile is being developed by Northrop Grumman Corporation under a contract with the US Air Force for \$13.3 billion. The US Department of Defense estimates that the cost of acquiring new missiles will be more than \$95 billion. The United States now has 400 Minuteman III intercontinental ballistic missiles, each of which can deliver up to three nuclear warheads at a distance of 12,000 km. They are the only force-based intermediate ballistic missiles in the triad of US strategic nuclear forces. Minotaur II+ is a suborbital launch system. At the moment, the US Air Force is in stage 3 of its development – launch and flight tests. By July 7, the Minotaur II+ had performed various test launches, the last one being the only failed launch. The Mk21A is the new carrier of the W87-1 nuclear warheads. This model nuclear warhead is extremely powerful. According to available data from open sources, its power is equal to 300 kilotons – 15 times more powerful and devastating than the "Fat Man" bomb dropped on Nagasaki in 1945. The W87-1 is part of the W87 family – a warhead with a long history and one of the oldest in the US Army inventory. Sources say the W87-1 has improved security and safety in its use. The name of the missile [Sentinel] was announced by Secretary of the Air Force Frank Kendall on April 5 2022 in a

press release.

Source-<https://bulgarianmilitary.com/2022/07/10/future-us-icbm-vehicle-for-mk21a-explodes-11-seconds-after-launch/>, 10 July 2022.

NUCLEAR ENERGY

EU

EU Lawmakers Back Gas, Nuclear Energy as Sustainable

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Under certain conditions, gas and nuclear energy will now be part of the mix, making it easier for private investors to inject money into both. EU lawmakers voted to include natural gas and nuclear in the bloc's list of sustainable activities, backing a controversial proposal from the bloc's executive arm that has been drawing fierce criticism from environment groups. The European Commission earlier this year made the proposal as part of its plans for building a climate-friendly future, dividing member countries and drawing outcry from environmentalists as "greenwashing." EU legislators from the environment and economy committees objected last month to the plan, setting up Wednesday's cliff-edge

vote in Strasbourg, France. But EU legislators rejected their resolution in a 328-278 vote, with the result announced in a salvo of applause. Greenpeace immediately said it will submit a formal request for internal review to the European Commission, and then take legal action at the European Court of Justice if the result isn't conclusive....

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Under certain conditions, gas and nuclear energy will now be part of the mix, making it easier for private investors to inject money into both. The

plan has divided the 27 member countries amid Russia's war in Ukraine, and even the parliament's political groups, while environmentalists claim it amounts to "greenwashing."... The commission believes that including nuclear and gas as transitional energy sources that would be phased out later doesn't amount to a free pass, as conditions would still have to be met. With the EU aiming to reach climate neutrality by 2050 and to cut greenhouse gas emissions by at least 55% by 2030, it says the classification system is crucial to direct investments into sustainable energy. It estimates that about 350 billion euros of investment per year will be needed to meet the 2030 targets. The EU is trying to wean itself off its dependency on Russian fossil fuels, and member countries have already agreed to ban 90% of Russian oil by year-end. Before the war in Ukraine, it relied on Russia for 25% of its oil and 40% of its natural gas.

Source-<https://www.thehindu.com/news/international/eu-lawmakers-back-gas-nuclear-energy-as-sustainable/article65606803.ece>, 06 July 2022.

GENERAL

Nuclear Newcomers Surge

Currently some 30 countries are considering, planning or starting nuclear power programmes as they seek a secure, low-carbon supply of energy. According to Grossi, IAEA's DG, based on their current national plans, 10 to 12 newcomers to nuclear power are expected to have begun development by 2035. There are a number of reactors already under construction in newcomer nations.

Currently some 30 countries are considering, planning or starting nuclear power programmes as they seek a secure, low-carbon supply of energy. According to Grossi, IAEA's DG, based on their current national plans, 10 to 12 newcomers to nuclear power are expected to have begun development by 2035.

Nuclear Plants under Construction: *Bangladesh* began construction of its first reactor in 2017 and its second in 2018. Two 1200MWe VVER-1200 reactors are being built by Rosatom at Rooppur, 160km northwest of Dhaka. Russia and Bangladesh signed an inter-governmental agreement for Rooppur as a turnkey project in 2011 and ASE Group was appointed general contractor in 2015. Rooppur 1 is scheduled to start operating in 2023 and Rooppur 2 in 2024. Rosatom will maintain the plant for the first year of operation. By 2023 more than 1500 Bangladeshis are expected to have trained at Novovoronezh II.

Russia will also supply fuel for the plant and take back the used fuel for processing.

Belarus began construction of Ostrovets 1 (in the Grodno region) in 2013 and unit 2 in 2014. The plant is based on Russia's VVER-1200. Russia will supply fuel and take back the used fuel. Unit 1 began commercial operations in June 2021. Construction of unit 2 is complete, and hot functional tests were completed in October 2021. Fuel loading started in December 2021 and commissioning is underway. Rosatom's Atomstroyexport (ASE) is building the 2400MWe plant under a 2011 intergovernmental agreement that includes a Russian state loan of US\$10bn for the project.

Rosatom will retain at least 51% of project company Akkuyu Nuclear, set up in 2011. Construction of unit 1 began in 2018, with start-up planned for 2023. All four units are now under construction with work well advanced at units 1&2. All four units are scheduled for operation by 2025 when the plant is expected to meet about 10% of Turkey's electricity needs.

Turkey invited bids for construction of a plant at Akkuyu on the Mediterranean coast in 2008. Russia's ASE and Inter RAO UES with Park Teknik (Turkey) proposed a plant with four 1200MWe reactors. In 2010 Russia and Turkey signed an intergovernmental agreement for Rosatom to build, own and operate

(BOO) the \$20bn plant – the first nuclear project to be built on this basis. Rosatom will retain at

least 51% of project company Akkuyu Nuclear, set up in 2011. Construction of unit 1 began in 2018, with start-up planned for 2023. All four units are now under construction with work well advanced at units 1&2. All four units are scheduled for operation by 2025 when the plant is expected to meet about 10% of Turkey's electricity needs. In 2013 Turkey accepted a proposal from a consortium led by MHI and Areva (with Itochu and Engie) to build a second plant with four Atmea 1 reactors but work was frozen in late 2018 when MHI pulled out of the project.

The UAE embarked on a nuclear power programme after accepting a US\$20bn bid from a South Korean consortium led by Korea Electric Power Corporation (Kepco) in 2009 to build four APR1400 reactors at Barakah between Abu Dhabi city and Ruwais. Emirates Nuclear Energy Corporation (Enec) and Kepco then set up Barakah One to deal with the financial aspects of the project. This included managing loan agreements of about US\$19.6bn.

Construction of unit 1 began in 2012, unit 2 in 2013, unit 3 in 2014 and unit 4 in 2015. The plant is now more than 96% complete and is generating electricity. Barakah 1 began commercial operation in April 2021, and unit 2 in March 2022. Units 3 and 4 are in the final stages of commissioning. The four units are expected to produce up to 25% of the UAE's electricity requirements.

Nuclear Plants Proposed or Planned: **Alongside** countries with reactors under construction are many more nations that are laying the groundwork to develop a nuclear power programme. Algeria began laying the legal basis to introduce nuclear energy by 2030-50 in 2018. It had already established the Atomic Energy Commission, built two research reactors and established an institute to train nuclear engineers. In 2009 the government announced plans for an operating nuclear plant by 2020, but in 2013 this was deferred to 2025. Agreements with Rosatom in 2014 and 2016 envisaged construction of VVER reactors with a view to completing the first in 2026. Agreements with China National Nuclear Corporation (CNNC) in 2015 and 2016 relate to a nuclear research centre, the Hualong One reactor,

and the ACP100 small reactor.

Azerbaijan received a proposal from Rosatom on nuclear power cooperation in 2018, including construction of an NPP. Rosatom offered two options – to start immediately at a site in the southern Avai region selected in Soviet times, or to develop cooperation over 5-6 years, installing a research reactor, building up competencies, and training staff.

Egypt's El-Dabaa NPP in Matruh province on the Mediterranean coast will comprise four VVER-1200 reactors constructed by Rosatom based on 2017 contracts. Russia will supply nuclear fuel throughout the lifecycle of the plant, arrange training, and assist in operation and maintenance for the first 10 years. The \$30bn project is mostly financed through a \$25bn Russian loan. The Nuclear Power Plants Authority (NPPA) was granted a site permit in 2019. Rosatom had hoped to begin work in 2020 for operation of unit 1 in 2026; on unit 2 in 2021 for operation in 2026; and on unit 3 in 2022 for operation in 2027. Construction will begin as soon as the necessary approvals are in place.

Estonia identified sites for a possible NPP in 2008. In 2009 state energy company Eesti Energia said that it was considering two 335MWe IRIS reactors, from Westinghouse. Government energy policy provided for Eesti Energiato build a NPP of up to 1000MWe and the company was granted a permit for site surveys of Suur-Pakri Island. However, interest then switched to SMRs and Fermi Energia was set up in 2019 to investigate. An agreement with UK-based Moltex Energy to undertake a feasibility study followed. In spring 2021 Fermi Energia signed co-operation agreements on SMR development with GE Hitachi and Rolls Royce. Estonia joined the US Department of State's Foundational Infrastructure for Responsible Use of Small Modular Reactor Technology (FIRST) programme at the end of 2021. In April 2022 Canada's Laurentis Energy Partners agreed to work with Fermi on SMRs.

Ghana's government announced plans to introduce nuclear power in 2007, specifying 400MWe of nuclear capacity by 2018. Long-term

plans envisaged 700MWe by 2025 expanding to 1000MWe. The Energy Ministry has identified three potential sites. In 2018 Ghana said construction of a 1200MWe NPP could begin in 2023-29 and in 2012 and 2015 Ghana signed nuclear cooperation agreements with Rosatom followed by an agreement for NPP construction. In 2021 Ghana signed an MOU Concerning Strategic Civil Nuclear Cooperation with the USA and in 2022 and Ghana joined the US FIRST programme for SMR development.

Indonesia's National Atomic Energy Agency (Batan) in 2001 led a call for tenders for two 1000 MWe units but these were put on hold. In 2007 Kepco and Korea Hydro & Nuclear Power (KHNP) signed a MOU for a feasibility study on two 1000MWe units but in 2013 Batan's focus shifted to SMRs. In 2014, nuclear co-operation with Japan was extended to research into high-temperature gas-cooled reactors (HTRs). A 2015 agreement with Rusatom Overseas related to small floating plants and a consortium of Russian and Indonesian companies won a contract for the preliminary design of a multi-purpose 10MWt HTR. In 2016 China Nuclear Engineering Corporation also signed a cooperation agreement to develop HTRs. In 2018, Batan launched a roadmap to develop an engineering design for an experimental small pebble-bed HTR and a site licence was received for a 10MWt reactor at Puspipetek research facility.

Jordan planned to have two 1000MWe nuclear units in operation by 2025 but is now considering SMRs. It has signed multiple nuclear cooperation agreements. The Committee for Nuclear Strategy, set up in 2007, had planned for nuclear power to provide 30% of electricity by 2030, and to provide for exports. In 2008 the Jordan Atomic Energy Commission (JAEC) investigated plant technologies including AECL's Candu-6, the Areva-Mitsubishi Atmea 1 and a KHNP design. In 2009 JAEC contracted Tractebel Engineering for a siting

study at Al Amra in Al Mafraq province and signed WorleyParsons for the pre-construction phase of a two-unit plant. In 2013 JAEC decided on two AES-92 units on a BOO basis with Rosatom Overseas. However, in 2018 the project was cancelled on the grounds of cost in favour of SMRs, and a new agreement was signed with Rosatom Overseas. A MOU was also signed with Rolls-Royce for an SMR feasibility study, and another with X-energy on its 76MWe Xe-100 HTGR. Talks were held with CNNC in 2018 on the possible construction of a 220MWe HTR-PM reactor for operation from 2025, and in 2019 an agreement was signed with US NuScale.

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Kazakhstan has been discussing nuclear power with Russia since 2006. In 2016 Kazakhstan had considered five possible sites – Ulken near Lake Balkhash in the south; Kurchatov, in the northeast; Taraz, near the border with Kyrgyzstan; and Aktau, on the shore of the Caspian Sea. In 2021 Kazakh President Kassym-Jomart Tokayev said Kazakhstan needed a NPP and advocated further investigation and the Energy Ministry began to study possible sites.

Kenya began considering nuclear power in 2010 and the Kenya Nuclear Electricity Board (KNEB) was set up in 2014. In 2015 and 2017 KNEB signed agreements with China General Nuclear Power (CGN) to investigate building a Hualong One reactor. Rosatom and Kepco also signed agreements with Kenya in 2016 on NPP construction. Kenya confirmed a target of 1000MWe online by 2025 and 4000MWe by 2033. In 2019, KNEB became the Nuclear Power and Energy Agency (NuPEA) and in 2020 deferred the timeline for an initial plant to 2035 and said SMRs would also be considered.

Nigeria has a well-established nuclear infrastructure. Nigeria's first research reactor, supplied by China, was commissioned in 2004. In 2009 the Nigerian Atomic Energy Commission (NEAC) set out a Strategic Plan, targeting

1000MWe of nuclear capacity by 2020, plus 4000MWe by 2030. In 2010, NEAC shortlisted four possible sites. Plans were revised in 2015 targeting first NPP grid connection by 2025 and increasing nuclear capacity to 4800MWe by 2035. In 2009 Russia signed an agreement with Nigeria for construction of a NPP and research reactor. In 2011 Rosatom and the NEAC finalised a draft intergovernmental agreement on the design, construction, operation and decommissioning of an NPP with three more plants planned at a total cost of \$20 billion. In 2012 Rosatom and NAEC signed a MOU to prepare a programme including financing options and considering a BOO arrangement. In 2021, a reconstituted Russian-Nigerian Joint Coordination Committee (JCC) on National Atomic Energy was launched for cooperation in the design, construction and decommissioning of NPPs.

Philippines is considering a nuclear power programme, including possible revival of the 621MWe Westinghouse mothballed NPP Bataan project or constructing an SMR. A 2008 update of the national energy plan envisaged 600MWe of nuclear online in 2025, with further 600MWe increments in 2027, 2030 and 2034. The Philippine Energy Plan 2018-2040 included a Nuclear Power Programme Roadmap, targeting the first NPP in 2027. In 2017 two nuclear cooperation agreements were signed with Rosatom, followed by another in 2019, to assess the feasibility of an SMR, floating or on land. In 2021 DOE identified 15 possible locations for a NPP and in February 2022 DOE was mandated to develop and implement a nuclear programme, including the possible revival of Bataan.

POLAND decided in 2005 that its first NPP should be operating soon after 2020. In 2009, the Council

of Ministers called for construction of at least two plants. The government plan envisaged construction of the first unit in 2016-20 and successive units by 2030. Power utility PGE announced plans to build two 3000MWe NPPs. A nuclear power programme, approved by the government in 2011, was confirmed by PGE in 2012.

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A draft energy policy to 2040, adopted in 2021, targeted halving coal use in favour of nuclear. Three NPP sites have been identified and the Energy Ministry plans to launch the first 1-1.5GWe reactor in 2035 and five more by 2043, for a total capacity of 6-9GWe. In 2021 a new state-owned company, Polish Nuclear Power Plants (Polskie Elektrownie Jądrowe, PEJ), was set up to pursue investment. PEJ selected the coastal location of Lubiatowo-Kopalino in Pomerania for the first reactor.

In 2021, the US Trade & Development Agency provided a grant to support design studies by Westinghouse and Bechtel for a AP1000 reactor. EDF offered to build up to six 1650 MWe EPR units and KHNP indicated it would offer its APR-1400.

In 2021, the US Trade & Development Agency provided a grant to support design studies by Westinghouse and Bechtel for a AP1000 reactor. EDF offered to build up to six 1650 MWe EPR units and KHNP indicated it would offer its APR-1400. In 2022 Bechtel and Westinghouse signed an MOU with GE Steam Power for joint pursuit of civil nuclear projects in Poland. Poland also plans to build a cogeneration 200-350MWt HTR for process heat and a 10MWt experimental HTR at Swierk. There is close cooperation with the Japan Atomic Energy Agency on HTRs and in 2022, US NuScale Power and Poland's KGHM Polska Miedz' agreed to initiate deployment of NuScale's SMR technology.

Saudi Arabia set up the King Abdullah City for Atomic and Renewable Energy (KA-CARE) in 2010 to advance alternative energies including nuclear. Plans included the construction of 16 reactors to

generate about 20% of Saudi Arabia's electricity and smaller reactors for desalination. In 2013, three sites were short-listed. Construction was expected to begin in 2016 to build 17GWe of nuclear capacity by 2032, but plans were scaled back in 2015 and the target date was moved to 2040. KA-CARE requested proposals for 2.9GWe of nuclear capacity, from South Korea, China, Russia and Japan. In 2018 a project was launched to build a research reactor. Saudi Arabia is also investigating SMRs, signing agreements with: the Korea Atomic Energy Research Institute; with Argentina's Invap; and China Nuclear Engineering Corporation. The Kingdom is working on a framework programme for nuclear energy for 2022-2027.

Sri Lanka's Long Term Generation Expansion Plan 2015- 2034, developed by the Ceylon Electricity Board (CEB), includes a scenario for 600MWe NPP from 2030. The draft of the 2020-2039 plan has a 600MWe nuclear unit starting up in 2035 and another in 2037. In 2010 the government commissioned its Atomic Energy Authority and CEB to conduct a pre-feasibility study on introducing nuclear energy from about 2025. The Atomic Energy Authority Act was revised in 2014 to establish the Sri Lanka Atomic Energy Board and the Sri Lanka Atomic Energy Regulatory Council. Sri Lankan nuclear experts are being trained in Russia. In 2015 the government signed nuclear cooperation agreements with India and Pakistan.

Sudan's Ministry of Energy & Mines initiated a nuclear power programme in 2010. The Ministry of Electricity and Water Resources set up the Nuclear Energy Generation Department to undertake a feasibility study for four 300- 600MWe units by 2030. This was changed in 2015 to two 600MWe PWRs by 2027. In 2016, a framework agreement was signed with CNNC to build one or two 600MWe reactors, with a nuclear cooperation roadmap for the next decade. A 2017 nuclear cooperation agreement with Rosatom included assessing the feasibility of a nuclear science and

technology centre with a research reactor and power plant.

Thailand's 2010 Power Development Plan (2010-2030) planned 5000MWe by 2020. After Fukushima, the date was pushed back to 2023 and deferred again under PDP2015, which targeted a 5% nuclear share (two 1000MWe PWR units) by 2036. The Electricity Generating Authority of Thailand (EGAT) signed agreements on nuclear development with CGN in 2009 and Japan Atomic Power Co in 2010. In 2014 the Thailand Institute of Nuclear Technology signed a nuclear cooperation agreement with Rosatom.

Uganda began establishing a framework for its nuclear power programme in 2008 when the Atomic Energy Bill came into effect. Uganda's Vision 2040 roadmap envisages significant nuclear capacity as part of the future energy mix. The Uganda Atomic Energy Council developed a Nuclear Power Roadmap Development Strategy that was approved by the cabinet 2015. In 2017 Uganda said it planned to build a 2,000MWe NPP by 2032. The base case scenario is for two 1000 MWe units by 2031 and potential sites were identified. Co-operation agreements were signed with Rosatom in 2016 and 2017 and with various Chinese companies, including CNNC in 2017 and 2018. Uganda said in 2022 that it had acquired land for the construction of its first NPP.

Uzbekistan expects nuclear to account for about 15% of energy generation by 2030. In 2018 an agreement was signed with Russia on cooperation in design and construction of a \$13bn two-unit station, with the first VVER-1200 reactor in operation by 2028. Most of the investment is expected to come from Russia. In 2019, a roadmap was issued detailing nuclear development for 2019-2029, including plants totalling 2.4GWe. The main stages are: site selection and licensing (2019-2020); design of nuclear plants and infrastructure (2020-2022); construction and commissioning (2022-2030). Uzbekistan is

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choosing a site for the first reactor and said in 2019 the first two units would be followed by two more.

It is clear from this analysis that Russia plays a key role in many newcomer nuclear countries. The current conflict in Ukraine is certain to roll back Russia's participation in the nuclear power programmes of NATO countries, even those with decades of experience using Soviet/Russian nuclear technology. However, for newcomer countries, and others in Central Asia, Asia, Africa, the Middle East and South America, this is unlikely to be a key factor in their technology choices. No other nuclear supplier offers such all-round

Russia plays a key role in many newcomer nuclear countries. The current conflict in Ukraine is certain to roll back Russia's participation in the nuclear power programmes of NATO countries, even those with decades of experience using Soviet/Russian nuclear technology. However, for newcomer countries, and others in Central Asia, Asia, Africa, the Middle East and South America, this is unlikely to be a key factor in their technology choices.

support, including soft financing and BOO options. Russia takes a long view, committing to support that may last a century, sometimes beginning with assistance in establishing nuclear research centres and research reactors. Extensive training is also provided as well as fuel supply, used fuel management services and decommissioning. So, while other suppliers, in particular the USA, are making rapid inroads in Europe, the rest of the world may still prefer to look to Moscow.

Source-<https://www.neimagazine.com/features/featurenuclear-newcomers-surge-9829730/#.YsrqYdLnqEk.gmail>, 07 July 2022.

GERMANY

Even in Gas Crisis, Germany Refuses Nuclear Power

Germans are urged to ration gas. "We are in the midst of a gas crisis," according to economy and climate minister Habeck. "From now on, gas is a scarce asset." Russia has reduced supplies to what is its largest customer in the EU in anger over the bloc's support for Ukraine. All consumers, whether in industry, in public institutions or private households, should reduce their gas consumption

as much as possible, so that we can make it through the winter. Habeck is auctioning gas supplies to industry to incentivize businesses to curb consumption, providing €15 billion in credit to pay for non-Russian gas supplies and reopening mothballed coal power plants. If Russia cuts off gas completely, Habeck fears the economic impact

could be "worse than the COVID pandemic." ... Yet even now, he will not contemplate keeping Germany's three remaining nuclear plants, which provide 5 percent of the country's electricity, in operation. They are slated to be retired at the end of the year...

Gas Crisis: Habeck said German gas reserves are filled to 58 percent, and

he's not on track to meet his 90-percent target for December. Before the war, Germany got between 10 and 15 percent of its electricity, and a quarter of its total energy (including heating), from burning gas. It has almost no domestic production. Germany is the world's largest importer of natural gas by volume. 55 percent of Germany's gas is imported from Russia. Norway, with 30 percent, is its second-largest supplier. Russia has more than halved gas supplies through the underwater Nord Stream pipeline in recent weeks, blaming maintenance work. It has also cut off or reduced deliveries to Denmark, Poland and the Netherlands, which normally reexport gas to Germany. Firing up old coal plants reduces the dependence on gas for electricity, but not for heating. That affects households, but also chemical and steel industries, which cannot operate without gas. (Long term, their alternative is green hydrogen — but that requires more green energy.) Burning coal, moreover, is the most polluting way to generate electricity. Nuclear plants emit zero greenhouse gasses.

Habeck argues keeping nuclear plants in operation would be unsafe and not cost-effective. Those are paper realities. Germany's nuclear laws are so

strict, its plants may well be the safest in the world. To keep the three remaining plants in operation, they would need to be relicensed and meet the latest safety standards, which have been updated since their last inspection in 2009. So if there's a problem, it's one the government itself created — and could waive. The plants surely can't be safe until the end of 2022, and suddenly become unsafe in January 2023? As for cost-effectiveness, that argument is premised on acquiring new fuel rods for all three reactors but only keeping them online for a short time, so they couldn't recuperate the costs. That's accounting wizardry to set nuclear power up to fail. The Süddeutsche Zeitung reports that current fuel rods can keep the largest of the three nuclear plants running into the summer 2023, and that the same plant could stay on the grid at least until 2028.

Source-<https://thecorner.eu/news-europe/european-economy/even-in-gas-crisis-germany-refuses-nuclear-power/102314/>, 04 July 2022.

SOUTH KOREA

S Korea to Lift Nuclear Power Share of Energy Mix to 30% by 2030

The U-turn in Asia's fourth-largest economy towards a pro-nuclear energy policy comes after Yoon won the March presidential election by the smallest margin in South Korea's democratic history. South Korea plans to increase the contribution of nuclear power in the country's power source mix to 30% or more by 2030 from 27.4% in 2021, the industry ministry said. South Korea's president, Suk-yeol, has rejected the idea of phasing out nuclear energy and made it a key pledge of his campaign to boost investment in the industry and revive its status as a key exporter of safe reactors. The U-turn in Asia's fourth-largest economy towards a

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pro-nuclear energy policy comes after Yoon won the March presidential election by the smallest margin in South Korea's democratic history.

While boosting the role of nuclear energy, the country plans to reduce its reliance on fossil fuel imports from 81.8% in 2021 to around 60% by 2030, the ministry said. "As the global carbon neutrality trend continues

and global energy supply chain instability increases due to the Russia-Ukraine crisis and other factors, the role of energy policy in achieving energy security and carbon neutrality goals is more important than ever," it said in a statement.

Source-<https://indianexpress.com/article/world/s-korea-to-lift-nuclear-power-share-of-energy-mix-to-30-by-2030-8009471/>, 05 July 2022.

NUCLEAR COOPERATION

RUSSIA-MYANMAR

Russia's Rosatom and Myanmar Sign Nuclear Energy MoUs

MoUs between Rosatom and Myanmar's Ministry of Science and Technology cover cooperation in training and skills development in the field of nuclear energy and shaping positive public opinion on nuclear energy in Myanmar....In its statement, Rosatom said "the parties stressed that the signing of the Memorandums lays a solid foundation for the development of further cooperation on practical projects".

The Myanmar government's account of the meeting said the parties had talked "about cooperation in the sectors

beneficial to peoples of both countries in atomic energy technological cooperation arena, conducting the science and research, manufacturing of pharmaceuticals, agriculture, livestock, industry and foodstuff sectors through

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the peaceful use of nuclear energy". In 2019, Myanmar produced 24.3 TWh of energy with 13.7 TWh from fossil fuels and 10.5 TWh from hydro and the two countries have already cooperated in the field of nuclear power. In June 2015, Russia and Myanmar signed a preliminary agreement to cooperate in the peaceful uses of nuclear energy. That followed on from a May 2007 agreement to construct a nuclear research centre in Myanmar - previously known as Burma - that would comprise a 10 MWt light water reactor working on 20%-enriched U-235, an activation analysis laboratory, a medical isotope production laboratory, silicon doping system, nuclear waste treatment and burial facilities.

In June 2015, Russia and Myanmar signed a preliminary agreement to cooperate in the peaceful uses of nuclear energy. That followed on from a May 2007 agreement to construct a nuclear research centre in Myanmar - previously known as Burma - that would comprise a 10 MWt light water reactor working on 20%-enriched U-235, an activation analysis laboratory, a medical isotope production laboratory, silicon doping system, nuclear waste treatment and burial facilities.

Although Myanmar was a founding member of the IAEA, it does not have any nuclear energy at the moment. It signed a country programme framework with the IAEA in 2016 and also joined the Convention on Nuclear Safety in the same year. It has been a signatory of the NPT since 1992.

Source- <https://world-nuclear-news.org/Articles/Russia-s-Rosatom-and-Myanmar-sign-nuclear-energy-M>, 13 July 2022.

SOUTH KOREA-IAEA

KEIA Signs Agreement on Nuclear Cooperation

State-owned Korea Energy Information Culture Agency (KEIA) signed an agreement with the International Atomic Energy Agency's Asia-Pacific regional agency to expand cooperation in promoting nuclear science technology. The Korean energy information agency will be working under the Regional Cooperative Agreement for Research, Development and Training Related to Nuclear Science and Technology for Asia and the Pacific

Nuclear-armed nations are projected to seek out more weapons in the coming decade, despite the fact that there has been a drastic decline in the number of nuclear warheads worldwide during the past 50 years. According to the data gathered from SIPRI and other related sources, the number of nuclear warheads could rise globally.

(RCA) to exchange nuclear-energy related information and develop education courses. "Our agency and the RCA office will be sharing each agency's international cooperation network as well as education and communication infrastructure effectively," said KIEA executive director. RCA was first founded in 1972 by the IAEA and has 22 member countries in the Asia-

Pacific region.

Source: <https://koreajoongangdaily.joins.com/2022/07/06/business/industry/Nuclear-KIEA-RCA/20220706181608156.html>, 06 July 2022.

NUCLEAR PROLIFERATION

GENERAL

Nuclear Warheads Expected to Increase in Next 10 Years

Nuclear-armed nations are projected to seek out more weapons in the coming decade, despite the fact that there has been a drastic decline in the number of nuclear warheads worldwide during the past 50 years. According to the data gathered from SIPRI and other related sources, the number of nuclear warheads could rise globally.

The NPT was signed on July 1, 1968, and entered into force in 1970 to prevent an escalating nuclear arms race as the US used the first nuclear bomb in the world against Japan in World War 2. The agreement is based on three basic principles: the prevention of nuclear proliferation, the use of nuclear energy for civilian purposes and nuclear disarmament.

Nine countries have nuclear warheads with the US and Russia owning about 90% of these warheads, which total 12,705. As of January 2022,

the US has 5,428 warheads while Russia has 5,997. China has 350 warheads, France 290, and the UK possesses 225 warheads. The list continues with Pakistan having 165, India 156, Israel 90, and North Korea 20 nuclear warheads.

Increase in Number of Warheads:

SIPRI's "2022 Yearbook" report warned that the number of nuclear warheads could rise globally again after the Cold War if countries with nuclear weapons do not take concrete action on disarmament as soon as possible. According to the report, the present decrease in the nuclear warheads of the US and Russia compared to 2021 and the previous years is due to the dismantling of obsolete warheads within the framework of modernization efforts. China, which does not have a transparent policy about nuclear weapons, is at an important threshold of increasing its nuclear weapons capacity. Satellite images taken from the country show 300 new missile silos under construction.

In 2021, the UK announced its decision to increase its nuclear warhead capacity to 260. The UK also reported that the country would not publicly release figures on its operational nuclear warhead capacity, deployed warheads and missiles. North Korea has also made its current military nuclear program a central element of its national security strategy. It is estimated that the country has enough material to produce 40-45 warheads, although the number of warheads at its disposal currently is about 20. France has also announced the launch of a program to develop a nuclear-fueled ballistic missile submarine. India and Pakistan also announced last year that they would develop missiles capable of carrying nuclear warheads.

Race for nuclear weapons-There are about 13,000 nuclear warheads in the world today. In 1945, the US became the first country to drop atomic bombs on the Japanese cities of Hiroshima and Nagasaki. After this attack, which killed thousands, many countries wanted to acquire nuclear power and

status in the early stages of the Cold War due to the high destructive power of nuclear bombs, their permanent harmful effects, and military and psychological superiority.... However, the data on Israel's nuclear weapons are based on estimates because the country follows a privacy policy on nuclear warheads. It is noted that the country conducted the first nuclear test in the 1960s....

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Source: <https://www.aa.com.tr/en/world/nuclear-warheads-expected-to-increase-in-next-10-years/2628075#>. 01 July 2022.

IRAN

Iran Nuclear Deal Talks in Doha End without Progress

Indirect talks between US and Iranian officials in Doha, Qatar, aimed at salvaging the Iran nuclear deal ended without any progress, a senior administration official said. Instead, the talks — which were brokered by the European Union — were left in a stagnant spot, "which at this point means backwards," the official said. A State Department spokesperson confirmed later that the talks concluded, saying, "While we are very grateful to the EU for its efforts, we are disappointed that Iran has, yet again, failed to respond positively to the EU's initiative and therefore that no progress was made." Top EU official Enrique Mora tweeted that there had been

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"two intense days of proximity talks in Doha on #JCPOA," the acronym for the formal name of the deal, the Joint Comprehensive Plan of Action. "Unfortunately, not yet the progress the EU team as

coordinator had hoped-for. We will keep working with even greater urgency to bring back on track a key deal for non-proliferation and regional stability," he said.

The State Department spokesperson said that "in Doha, as before, we made clear our readiness to quickly conclude and implement a deal on mutual return to full compliance with the JCPOA based

on almost a year and a half of negotiations."Bottom of Form

"Yet in Doha, as before, Iran raised issues wholly unrelated to the JCPOA and apparently is not ready to make a fundamental decision on whether it wants to revive the deal or bury it," the spokesperson said. The spokesperson for the Iranian Foreign Ministry said in a tweet that the talks were "intensive." "Iran presented its operational ideas and suggestions and the other side also presented their considerations," spokesperson Nasser Kanani said, adding that Mora and Iran's negotiator Ali Bagheri Kani "will remain in touch regarding the continuation of talks and the next stage." The discussions in the Qatari capital to try to restore the 2015 agreement followed months of standstill after numerous rounds of talks in Vienna, Austria, failed to reach a breakthrough. They were revived following a visit to Tehran by EU foreign policy chief Josep Borrell.

Source-<https://edition.cnn.com/2022/06/29/politics/iran-nuclear-deal-talks-end-no-progress/index.html>, 29 June 2022.

IAEA's Grossi Warns Iran Nuclear Program may be Copied

Iran's developing nuclear program could lead other countries to follow suit, according to Grossi, DG IAEA. In a lecture, Grossi said that "challenging" diplomacy aimed at restoring the 2015 Iran nuclear was taking place in an "important" context. "The lack of progress in verifying the peaceful nature of Iran's nuclear program may affect other countries' decisions," Grossi said at the Coral Bell School of Asia Pacific Affairs, Canberra. "We are now in a situation where Iran's neighbors could start to fear the worst and plan accordingly. There are countries in the region today looking very carefully at what is happening with Iran, and tensions in the region are rising. Political leaders have on occasionally openly stated they would actively seek nuclear weapons if Iran were to pose a nuclear threat." Grossi did not elaborate. There have been intermittent, but

unsubstantiated reports, that Saudi Arabia has an arrangement with Pakistan over an option of importing technology needed for nuclear weapons. Saudi Arabia plans to operate two nuclear reactors for civil purposes by 2040. Like Tehran, Riyadh is a signatory of the NPT.

Grossi said "a defining moment" was being reached for "global nuclear non-proliferation," with continuing "tendencies towards proliferation" despite a "strong" international non-proliferation framework with 192 NPT signatories and 175 member states in the IAEA.

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The IAEA director-general emphasized the importance of additional protocols, agreements reached with non-nuclear states giving greater inspections powers to the agency than required under the more limited NPT 'safeguards' arrangements. He argued that additional protocols developed by the 1990s reflected experience

of Iraq, where a declared nuclear program in the 1980s hid an undeclared program that was "far from peaceful.

Iran – 'Periods of Tension and Cooperation':

Turning to Iran, Grossi surveyed 20 years of "countless interactions between the IAEA and Iran aimed at verifying that Iran's nuclear program is purely peaceful." He referred to "UN Security Council resolutions demanding that Iran cease all enrichment... times when Iran provisionally applied an additional protocol and times when it did not...[as well as] periods of cooperation and periods of tension."

Grossi recalled the days of the 2015 nuclear agreement, the JCPOA (Joint Comprehensive Plan of Action), which ended with United States withdrawal in 2018 and Iran in 2019 beginning to exceed JCPOA limits on its nuclear program. "The IAEA was charged [under the JCPOA] with verifying that Iran respected the new restrictions on its nuclear program," Grossi said. "Of great importance also was Iran's acceptance once more of the additional protocol."

... In his speech, Grossi also highlighted agency

dissatisfaction at Iran's explanation of uranium traces found at sites linked to work before 2003 in the face of "assembled credible information indicating a possible military dimension." The IAEA board last month passed a resolution censuring Iran over its alleged failure to resolve these "longstanding safeguards issues." Grossi defended a return to the JCPOA in the face of failure by the US and Iran, meeting in Doha 'proximity' talks, to agree a path back to compliance. The IAEA chief said that after decades of work to combat proliferation "what remains constant is that the Agency is the ultimate guarantee of any agreement." Without IAEA participation, he argued, "any agreement is unverifiable."

Source: <https://www.iranintl.com/en/202207073810>, 07 July 2022.

Fears Grow Over Iran's Nuclear Program as Tehran Digs a New Tunnel Network

Israeli and American intelligence officials have been watching each day as Iran digs a vast tunnel network just south of the Natanz nuclear production site, in what they believe is Tehran's biggest effort yet to construct new nuclear facilities so deep in the mountains that they can withstand bunker-busting bombs and cyberattacks.

Though the construction is evident on satellite photographs and has been monitored by groups that track the proliferation of new nuclear facilities, Biden administration officials have never talked about it in public and Israel's defense minister has mentioned it just once, in a single sentence in a speech last month. In interviews with national security officials in both nations, there clearly were differing interpretations of exactly how the Iranians may intend to use the site, and even how urgent a threat it poses.

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... By most accounts, Iran is closer to being able to produce a bomb today than at any other point in the two-decade-long saga of its nuclear program — even if it is planning, as many national

security officials believe, to stop just short of producing an actual weapon. The IEA said earlier this month that the country is just weeks away from being able to enrich enough bomb-grade fuel to make a single nuclear bomb — though fashioning that into a usable weapon could take at least another two years, even by the most alarmist Israeli estimates. President

Biden has not publicly discussed Iran's decision to ignore the demands of nuclear inspectors for access to a series of sites. But the facility could eventually prove critical to Iran if the Biden administration's efforts to revive the 2015 nuclear agreement continue to run into roadblocks. And for now, at least, efforts to reimpose limits on Iran's

nuclear actions appear all but dead.

...Biden's refusal of Iran's demand to remove the Islamic Revolutionary Guards Corps from the list of terrorist organizations, along with a flow of new revenue to Tehran resulting from today's

soaring oil prices, have contributed to the stalemate in the talks. Now, the Iranians are looking for new pressure points, including the excavation of the mountain plant near Natanz. And over the past week, Iranian authorities have switched off 27 cameras that gave inspectors a view into Iran's production of fuel.

The decision to cut off the cameras, which were installed as part of the nuclear deal, was particularly worrisome to Grossi, the DG of IAEA. If the cameras remain off for weeks, and it is impossible to track the whereabouts of nuclear materials, "I think this would be a fatal blow" to hopes of reviving the accord, said Grossi. But this is far more than an inspection dispute. In the eyes

of experts, Tehran is getting to the point of becoming a “nuclear threshold state whose uranium enrichment program creates an inherent option—a hedge—to produce nuclear weapons,” without actually taking the last step.

Source: <https://www.nytimes.com/2022/06/16/us/politics/iran-nuclear-program-tehran.html>, 27 June 2022.

NUCLEAR DISARMAMENT

States-Parties Meet on Nuclear Arms Ban Treaty

The first meeting of states-parties to the Treaty on the Prohibition of Nuclear Weapons (TPNW) has produced an ambitious 50-point action plan and several decisions designed to implement the 2017 agreement. It also adopted a political statement that aims, in part, to reinforce norms against nuclear weapons use and threat of use. “We will not rest until the last state has joined the treaty, the last warhead has been dismantled and destroyed, and nuclear weapons have been eliminated from this earth,” delegates said in a joint declaration issued at the close of the meeting. “We stress that any use or threat of use of nuclear weapons is a violation of international law, including the Charter of the United Nations. We condemn unequivocally any and all nuclear threats, whether they be explicit or implicit and irrespective of the circumstances,” the declaration added. The June 21–23 meeting in Vienna occurred at a moment of unprecedented post-Cold War instability as Russia wages war against Ukraine.

To date, 86 states have signed and 66 states have ratified the treaty, which prohibits the possession, development, transfer, testing, use, or threat of use of nuclear weapons. The TPNW entered into force in January 2021. The condemnation represents the strongest multilateral criticism of such nuclear threats since the UN General Assembly approved a resolution on March 2 condemning the Russian invasion of Ukraine and President Vladimir Putin’s decision to increase the

readiness of his nuclear forces. There have also been exchanges of nuclear threats between the United States and North Korea in 2017 and Pakistan’s reference to the possibility of nuclear war with India in 2019, according to a TPNW conference working paper. Most recently, Russia threatened to use nuclear weapons if NATO members intervene militarily in the war in Ukraine.

In a statement issued June 24 by Russian Foreign Ministry spokesperson Maria Zakharova, the Russian government rejected the criticism. “There have never been any ‘nuclear threats’ from Russia and never are. The Russian approach to this issue is based solely on the logic of deterrence.” Calling NATO actions to be “dangerously balancing on the

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verge of a direct armed conflict with our country,” she argued that “the logic of deterrence remains an effective way to prevent a nuclear collision and large-scale wars.” Several states-parties at the Vienna meeting expressed deep concerns about the risks posed by the dangerous nuclear deterrence policies

espoused by Russia and the eight other nuclear-armed states and their allies. “The logic that nuclear deterrence provides security is a fundamental error because deterrence requires credibility, meaning the readiness to actually use these weapons.... In addition, the conference agreed on steps to promote further TPNW ratifications and to establish a scientific advisory group on the technical aspects of the treaty, including the risks and consequences of nuclear weapons and their use.

The conference statement also expressed deep concern with the fact that none of the nuclear-armed states are taking serious steps to reduce dependence on nuclear weapons. “Instead, all nuclear-armed [states] are spending vast sums to modernize, upgrade, or expand their nuclear arsenals and placing a greater emphasis and increasing the role of nuclear weapons in security doctrines,” the declaration said. According to a 2022 report of the SIPRI, nuclear arsenals are expected to grow in the coming decade, despite

a marginal decrease in the number of nuclear warheads in 2021. The two largest nuclear weapons possessors, Russia and the United States, have suspended discussions on a follow-on arms control agreement to the New Strategic Arms Reduction Treaty, which will expire in 2026. States-parties also agreed on steps relating to their obligations under treaty articles VI and VII to address the harm from the use and testing of nuclear weapons, including the establishment of an international trust fund for assisting health issues in affected states and for environmental remediation.

They pledged to pursue high-level engagement with states that have not joined the treaty, which was negotiated by more than 120 countries but not the nuclear-armed states. In 2021, NATO members declared their opposition to the treaty in the Brussels summit communiqué, saying, "We reiterate our opposition to the [TPNW] which is inconsistent with the alliance's nuclear deterrence policy, is at odds with the existing non-proliferation and disarmament architecture, risks undermining the NPT, and does not take into account the current security environment." Yet, NATO member states and close U.S. allies such as Finland, Germany, the Netherlands, Sweden, and Norway attended the first meeting of states-parties as observers....

The TPNW conference reaffirmed that the treaty is designed to complement and strengthen the existing nonproliferation and disarmament regime. "In the absence of an enabling legally binding framework and the slow pace of implementation of agreed

disarmament commitments, the TPNW's negotiation and adoption is an effort by nonnuclear-weapon states to make progress towards the full implementation of Article VI of the NPT...[which is] an obligation for all NPT states-parties," according to a conference working paper developed by Ireland and Thailand in advance of the meeting of states-parties. States-parties agreed to pursue further discussions about establishing or designating a competent international authority to monitor and verify the disarmament process. They acknowledged the need to elaborate on what procedure and timeline should follow in case a state wishes to disarm and remove nuclear weapons from its territory....

Source: <https://www.armscontrol.org/act/2022-07/news/states-parties-meet-nuclear-arms-ban-treaty>, July/August 2022.

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NUCLEAR NON-PROLIFERATION

AUSTRALIA

UN Nuclear Watchdog 'Absolutely Confident' in Australia's Commitment to Non-proliferation

The UN nuclear watchdog is confident in Australia's commitment to nuclear non-proliferation, but says the technical details remain to be seen. Grossi has set up a taskforce to investigate the safeguards and legal implications of the deal, under which Australia will buy the nuclear powered submarines from either the United States or the United Kingdom. The agency must ensure Australia will not breach the nuclear non-proliferation treaty and there are global concerns that other states will seek to follow Australia's move to have nuclear submarines.

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proliferation treaty and there are global concerns that other states will seek to follow Australia's move to have nuclear submarines.

A reactor on a military submarine is impossible for the IAEA to monitor as it does other reactors, and ill-intentioned states could conceivably try to use that lack of transparency to gain reactors and channel the technology into nuclear weapons. Grossi said Australia's "special arrangement" was necessary because with naval nuclear submarines out at sea for many months, he "can't send another vehicle to chase it and inspect it". "Not surprisingly, the consideration around Aukus and the project to give Australia nuclear naval propulsion has been at the centre of the conversation," he said. "I got a very clear commitment about Australia's unwavering commitment to, and support of, non-proliferation and the need for us to work together. "This is a technologically challenging project that will require very specific arrangements between IAEA and Australia."

Grossi said they were at the very initial steps of the project as the exact submarine had not even been chosen yet, and that the agency would ensure there were "no loopholes or proliferation escapes that would allow for this material or part of it to be deviated or lost". He said he was "absolutely confident about the commitment of the country" to nuclear non-proliferation, but that the technical details had to be worked out for the whole process to be approved. "Then, we will have to see. The political commitment of the government is indispensable. We have that," he said. "Now we have to go down to the technical [and legal] work, and it will only be once we see eye to eye on every technical aspect."...

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Source-<https://www.theguardian.com/australia-news/2022/jul/04/un-nuclear-watchdog-absolutely-confident-in-australias-commitment-to-non-proliferation>, 04 July 2022.

INDIA

Not Signing the NPT One of India's Most Consequential Decisions: Former Envoy

Former Indian Ambassador to Russia D.B. Venkatesh Varma says expectation that one big power will prioritise India's security interests or the notion that we have shared security objectives "is borne more out of fantasy than out of reality"

The war in Ukraine is a "global war" and the distant war in Europe will soon make its presence felt in India's neighbourhood, said D.B. Venkatesh Varma, former Indian Ambassador to Russia. In the backdrop of the hair-trigger nuclear posture between Russia and the U.S. and the emergence of China as a major nuclear power, he said one of the most consequential decisions by India was to not sign the NPT.

"With the rise of China as a nuclear peer competitor, the bipolar nuclear deterrence structure (comprised of the U.S. and Russia) has morphed into a tripolar nuclear structure whose stability remains untested. This remarkable story of China's emergence as a major nuclear power,

unconstrained by the NPT, CTBT, FMCT and non-existence of any arms control in the space, cyber and maritime spheres is really unbelievable..." Mr. Varma said while speaking at a seminar on 'Global Nuclear Landscape' organised by the Centre for Air Power Studies. "China benefited initially from big power distract, now it benefits

from big power perfidy and incompetence.”

Talking of India’s standing, Mr. Varma said India stands in a “relatively” advantageous position because of what it had done and what it had refrained from doing. “Looking back, one of the most consequential decisions by India was to not sign the NPT, and the three-decade struggle to wriggle out of its constraints in the civil nuclear deal.... The India as we know today would not have existed (had it signed the NPT),” he stated while stressing on the need to depend on own resources to build on the capabilities in the military, nuclear, space and cyber domains. ...

Source: <https://www.thehindu.com/news/national/not-signing-the-npt-one-of-indias-most-consequential-decisions-former-envoy/article65635838.ece>, 14 July 2022.

RUSSIA

Russia Open to Dialogue on Nuclear Non-proliferation, Putin Says

Russian President Vladimir Putin said that Moscow was open to dialogue on strategic stability and nuclear non-proliferation, but the Kremlin said no such talks with Washington were on the cards for now. Despite Russia’s invasion of Ukraine, both Moscow and Washington have stressed the importance of maintaining communication on the issue of nuclear arms. The two countries are by far the world’s largest nuclear powers, with an estimated 11,000 nuclear warheads between them.

“Russia is open to dialogue on ensuring strategic stability, preserving non-proliferation regimes for weapons of mass destruction and improving the situation in the field of arms control,” Putin said in remarks to a legal forum in his home city of St.

Petersburg. Speaking later, Kremlin spokesperson Peskov confirmed there had been no direct contact between Putin and U.S. President Joe Biden since

Russia launched what it calls a “special military operation” in Ukraine in February. Asked if there were any plans for strategic stability talks between the two countries, he said: “Unfortunately there are no tangible plans for this yet.” Putin said any efforts towards extending arms control would require “painstaking joint work” but could go towards preventing a repeat of “what is

happening today in the Donbas”....

Source-<https://www.reuters.com/world/europe/russia-open-dialogue-nuclear-non-proliferation-putin-says-2022-06-30/>, 30 June 2022.

NUCLEAR SAFETY

USA-NATO

US, NATO Allies to Hold Chemical, Biological, Nuclear Training

Several units from the US Army’s all-hazards command will participate in CBRN training with NATO allies in Canada. The multi-national training is being held to develop and enhance NATO’s CBRN defense capabilities, also improving the readiness of the NATO Response Force’s CBRN Defense Battalion. According to biological threat assessment section chief Maj. Joshua M. Carmen, the exercise will help soldiers validate their capabilities in an austere environment. He further

stated that the event will address gaps and challenges in sampling, receiving, testing, and reporting potentially hazardous materials. “Working with a partner nation always improves our ability to support international missions, and

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having so many nations concentrated in one exercise, along with the live agents, makes this a great opportunity to see how our multinational partners operate and lets them see our capabilities," Carmen remarked.

In addition to the US, CBRN troops from Canada, Austria, Belgium, the Czech Republic, Denmark, France, Germany, Italy, the Netherlands, Norway, Slovakia, and the UK will participate in the drill.

Investments in CBRN

Defense: The US has invested millions of dollars to bolster its CBRN defense capabilities amid evolving threats. In March, US Army National Guard units participated in a biannual CBRN exercise in Alaska, responding to all-hazards events while coordinating with civilian assets and federal agencies. The US Air Force also tested its new protective suit that protects airmen from CBRN attacks. Finally, the US Defense Threat Reduction Agency also allocated \$15.7 million for an augmented reality technology that displays biological and chemical threats.

Source: Joe Saballa, <https://www.thedefensepost.com/2022/07/11/us-nato-chemical-nuclear/?emci=056f0c42-70f1-ec11-b47a-281878b83d8a&emdi=d333ec48-4b04-ed11-b47a-281878b83d8a&ceid=9326860>, 11 July 2022.

NUCLEAR WASTE MANAGEMENT

GENERAL

Focus on Safety of Spent Fuel and Radioactive Waste Management at 7th Review Meeting of the Joint Convention

More than 750 delegates representing 76 Contracting Parties to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management are at

the IAEA's headquarters in Vienna to share their experiences and lessons learned in safely managing spent fuel and radioactive waste. This Seventh Review Meeting of the Joint Convention was originally scheduled for 2021, but was postponed until 27 June to 8 July this year due to the COVID-19 pandemic.... He recalled that the Contracting Parties were here now to fulfill the most important obligation of the Convention, namely to conduct an effective, rigorous and

transparent peer review which will lead to the identification of measures to further strengthen nuclear safety globally.

IAEA DG Grossi highlighted the relevance of the Convention not only to countries with a major nuclear power programme, but to any country using radioactive sources. "More patients are getting lifesaving treatment for cancer. More countries are using nuclear science and technology to support their sustainable development goals, and more countries are turning to nuclear energy to address the climate and energy crisis," he said in his opening remarks. "The use of

nuclear material is rising. We are here today to ensure that the ensuing spent fuel and radioactive waste are managed safely, in accordance with the obligations of the Joint Convention and international safety standards," he said....

Mr Grossi also informed delegates of the IAEA's preliminary discussions to support Ukraine, where needed, including with the safe management of radioactive sources, in particular disused and orphan sources. "Our experts are available to provide immediate remote assistance, for example to support the verification of the inventory of radioactive sources or for the provision of technical assessments; and teams are also ready to travel to Ukraine to deliver on-site support in areas such as source recovery and

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consolidation, and the safe and secure transportation of radioactive sources to centralized storage facilities.” The Joint Convention, in force since 2001 under the auspices of the IAEA, is the only international legally binding instrument addressing the safety of spent fuel and radioactive waste management on a global scale. During the review meeting, Contracting Parties will also take part in an open-ended working group to discuss procedural and other issues relevant to the functioning of the Convention, and will share their experiences and lessons learned in a topical session on stakeholder engagement in the management of radioactive waste from decommissioning activities and legacy sites....

Source: <https://www.iaea.org/newscenter/news/focus-on-safety-of-spent-fuel-and-radioactive-waste-management-at-7th-review-meeting-of-the-joint-convention>, 28 June 2022.

UAE

UAE Presents National Report on Spent Nuclear Fuel, Radioactive Waste Management

The UAE is participating as a Contracting Party to the Joint Convention, which is holding its 7th review meeting at the IAEA headquarters in Vienna, Austria. The UAE has presented its Fourth National Report on Compliance with the Obligations of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. The UAE is participating as a Contracting Party to the Joint Convention, which is holding its 7th review meeting at the IAEA headquarters in Vienna, Austria.

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The National Report describes the legislative and regulatory measures taken by the UAE to meet its obligations in relation to the Joint Convention. The Federal Authority for Nuclear Regulation (FANR) issued and drafted six regulations containing requirements on managing radioactive waste such as “Radiation Protection and Predisposal Radioactive Waste Management in Nuclear Facilities”, and “Decommissioning of Facilities”, and is working on developing another regulation on “Decommissioning Trust Fund”.

Such efforts reflect the UAE’s commitment to the 2008 Nuclear Policy, where it has plans to develop an integrated waste management system that reflects the highest standards of international practices. The report also addresses options in regards to spent fuel and radioactive waste management: Emirates Nuclear Energy Corporation (ENEC) and its affiliates have taken some measures such as the design of Barakah Nuclear Power Plant provides sufficient capacity to store spent fuel in a pool made for every unit. In addition, concerned entities are working to look at long-term spent fuel management options for different scenarios.

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The delegation also presented measures taken to address non-nuclear radioactive waste produced from medical and industrial facilities across the UAE. Currently, there are over 2,000 licensees using regulated material, and radioactive sources in the UAE are used for medical, industrial, and educational sectors as well as the oil and gas industry. Moreover, the UAE delegation presented the efforts of national stakeholders to build Emirati capabilities in the nuclear sector in collaboration with several UAE educational and training

institutions. Over the past. Intensive training programmes were put in place to qualify and build the experience of the knowledge-intensive nuclear sector. FANR also certified over the past four years around 157 Reactor Operator/Senor Reactor

Operators who are qualified to operate the nuclear power plan. ...

Source: <https://www.zawya.com/en/business/energy/uae-presents-national-report-on-spent-nuclear-fuel-radioactive-waste-management-eeksvgt1>, 29 June 2022.



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