



Vol 14, No. 14, 15 MAY 2020

OPINION – Rakesh Sood

At the Edge of a New Nuclear Arms Race

In mid-April, a report issued by the United States State Department on “Adherence to and Compliance with Arms Control, Non-proliferation, and Disarmament Agreements and Commitments (Compliance Report)” raised concerns that China might be conducting nuclear tests with low yields at its Lop Nur test site, in violation of its CTBT undertakings. The U.S. report also claims that Russia has conducted nuclear weapons experiments that produced a nuclear yield and were inconsistent with ‘zero yield’ understanding underlying the CTBT, though it was uncertain about how many such experiments had been conducted. Russia and China have rejected the U.S.’s claims, but with growing rivalry among major powers the report is a likely harbinger of a new nuclear arms race which would also mark the demise of the CTBT that came into being in 1996 but has failed to enter into force even after a quarter century.

What does CTBT Ban Mean? For decades, a ban on nuclear testing was seen as the necessary first step towards curbing the nuclear arms race but Cold War politics made it impossible. A Partial Test Ban Treaty was concluded in 1963 banning

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underwater and atmospheric tests but this only drove testing underground. By the time the CTBT negotiations began in Geneva in 1994, global politics had changed. The Cold War had ended and the nuclear arms race was over. The USSR, had broken up and its principal testing site, Semipalatinsk, was in Kazakhstan (Russia still had access to Novaya Zemlya near the Arctic circle). In 1991, Russia declared a unilateral moratorium on testing, followed by the U.S. in 1992. By this time, the U.S. had conducted 1,054 tests and Russia, 715. Negotiations were often contentious. France and China continued testing, claiming that they had

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conducted far fewer tests and needed to validate new designs since the CTBT did not imply an end to nuclear deterrence. France and the U.S. even toyed with the idea of a CTBT that would permit testing at a low threshold, below 500 tonnes of TNT equivalent. This was one-thirtieth of the "Little Boy", the bomb the U.S. dropped on Hiroshima on August 6, 1945 — its explosive yield was estimated to be the equivalent of 15,000 tonnes of TNT. Civil society and the non-nuclear weapon states reacted negatively to such an idea and it was dropped. Some countries proposed that the best way to verify a comprehensive test ban would be to permanently shut down all test sites, an idea that was unwelcome to the nuclear weapon states.

Eventually, the U.S. came up with the idea of defining the "comprehensive test ban" as a "zero yield" test ban that would prohibit supercritical hydro-nuclear tests but not sub-critical hydrodynamic nuclear tests. Once the UK and France came on board, the U.S. was able to prevail upon Russia and China to accept this understanding. After all, this was the moment of the U.S.'s unipolar supremacy. At home, the Clinton administration in the U.S. satisfied the hawks by announcing a science-based nuclear Stockpile Stewardship and Management Program, a generously funded project to keep the nuclear laboratories in business and the Pentagon happy. Accordingly, the CTBT prohibits all parties from carrying out "any nuclear weapon test explosion or any other nuclear explosion"; these terms are neither defined nor elaborated.

Why it Lacks Authority: Another controversy arose regarding the entry-into-force provisions (Article 14) of the treaty. After India's proposals for anchoring the CTBT in a disarmament framework did not find acceptance, in June 1996, India announced its decision to withdraw from the negotiations. Unhappy at this turn, the U.K., China and Pakistan took the lead in revising the entry-

into-force provisions. The new provisions listed 44 countries by name whose ratification was necessary for the treaty to enter into force and included India. India protested that this attempt at arm-twisting violated a country's sovereign right to decide if it wanted to join a treaty but was ignored.

The CTBT was adopted by a majority vote and opened for signature. Of the 44 listed countries, to date only 36 have ratified the treaty. China, Egypt, Iran, Israel and the U.S. have signed but not ratified. China maintains that it will only ratify it after the U.S. does so but the Republican dominated Senate had rejected it in 1999. In addition, North Korea, India and Pakistan are the three who have not signed. All three have also undertaken tests after 1996; India and Pakistan in May 1998 and North Korea six times between 2006 and 2017. The CTBT has therefore not entered into force and lacks legal authority. Nevertheless, an international organisation to verify the CTBT was established in Vienna with a staff of about 230 persons and an annual budget of \$130 million. Ironically, the U.S. is the largest contributor with a share of \$17 million. The CTBTO runs an elaborate verification system built around a network of over 325 seismic, radionuclide, infrasound and hydro acoustic (underwater) monitoring stations. The CTBTO has refrained from backing the U.S.'s allegations.

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Competition is Back: The key change from the 1990s is that the U.S.'s unipolar moment is over and strategic competition among major powers is back. The U.S. now identifies Russia and China as 'rivals'. Its Nuclear Posture Review asserts that the U.S. faces new nuclear threats because both Russia and China are increasing their reliance on nuclear weapons. The U.S., therefore, has to expand the role of its nuclear weapons and have a more usable and diversified nuclear arsenal. The Trump

administration has embarked on a 30-year modernisation plan with a price tag of \$1.2 trillion, which could go up over the years. Readiness levels at the Nevada test site that has been silent since 1992 are being enhanced to permit resumption of testing at six months' notice.

Russia and China have been concerned about the U.S.'s growing technological lead particularly in missile defence and conventional global precision-strike capabilities. Russia has responded by exploring hypersonic delivery systems and theatre systems while China has embarked on a modernisation programme to enhance the survivability of its arsenal which is considerably smaller. In addition, both countries are also investing heavily in offensive cyber capabilities. The new U.S. report stops short of accusing China for a violation but refers to "a high level of activity at the Lop Nur test site throughout 2019" and concludes that together with its lack of transparency, China provokes concerns about its intent to observe the zero-yield moratorium on testing. The U.S. claims that Russian experiments have generated nuclear yield but is unable to indicate how many such experiments were conducted in 2019. It suggests that Russia could be testing in a manner that releases nuclear energy from an explosive canister, generating suspicions about its compliance.

The New START limits U.S. and Russian arsenals but will expire in 2021 and U.S. President Donald Trump has already indicated that he does not plan to extend it. Instead, the Trump administration would like to bring China into some kind of nuclear arms control talks, something China has avoided by pointing to the fact that the U.S. and Russia still account for over 90% of global nuclear arsenals.

Current Context: Both China and Russia have dismissed the U.S.'s allegations, pointing to the

Trump administration's backtracking from other negotiated agreements such as the Iran nuclear deal or the U.S.-Russia INF Treaty. Tensions with China are already high with trade and technology disputes, militarisation in the South China Sea and most recently, with the novel coronavirus pandemic. The U.S. could also be preparing the ground for resuming testing at Nevada. The Cold War rivalry was already visible when the nuclear arms race began in the 1950s. New rivalries have already emerged. Resumption of nuclear testing may signal the demise of the ill-fated CTBT, marking the beginnings of a new nuclear arms race.

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Source: <https://www.thehindu.com/opinion/lead/at-the-edge-of-a-new-nuclear-arms-race/article>

31439692.ece, 27 April 2020.

OPINION – Martín de Ambrosio, et al.

Uneven Use of Nuclear Programmes Across Regions

Five decades after signing the treaty on the non-proliferation of nuclear weapons, the broad development of this energy and other uses of its potential such as medical and research purposes are gaining momentum in the developing world. "No developed nation has been able to get to where it is without having involved itself in nuclear energy production," Abulrazak Shaukat, Director of the Division of Africa at the IAEA says to *SciDev.Net*. Ildeu de Castro Moreira, President of the Brazilian Society for the Advancement of Science, highlights three main important areas where research on nuclear field can contribute: "energy power as well as medicine for cancer diagnosis and treatments, and agriculture for food conservation". Moreira adds that all countries "have the right to do research in the nuclear field because it can contribute to everyday life and economics".

Nevertheless, the road to it is bumpy, it takes years of implementation and requires prepared human resources as well as investments in the order of billions of dollars. "Joining the nuclear world is not something that happens overnight but instead takes years — up to ten years — from the time of implementation to operation of the first reactor. This period is sufficient enough for newbies to learn and be prepared for their first launch," Shaukat tells *SciDev.Net*. In fact, many developing countries do not have the kind of skilled human resource or funding needed to properly start and operate a nuclear power plant. Furthermore, these countries are highly dependent on foreign experts, and for worst, a report released by the IAEA in 2004 points out to the fact that several nuclear experts were about to retire.

The IAEA is the UN centre for cooperation in the nuclear field and for promoting safe, secure and peaceful use of nuclear technologies. Hossam El-Din Hassan, assistant professor of nuclear sciences at Sudan Atomic Energy Commission, explains to *SciDev.Net* that human resources difficulties can be addressed through training provided by international organisations such as the IAEA or countries advanced in the field including China and Russia. "Perhaps the real crisis in terms of human resources is how to [retain] those talents after being trained," he says. He pointed out that Sudan has established a faculty for nuclear engineering to help the country with its peaceful nuclear programme. Unfortunately, inability to sustain those teams led to many of them migrating or shifting to other sectors.

Meanwhile, crossing the Atlantic Ocean, Latin American countries such as Argentina and Brazil

despite joining other countries with nuclear capabilities since the 1950s are suffering from inadequate investments for capacity building in nuclear development.

"The problem in Latin American countries is a financial issue because with every new administration, financial support for nuclear projects is interrupted," says Norma Boero, former President of Argentinean National Commission of Atomic Energy. "Three major projects in the nuclear energy sector are either interrupted or behind the schedule," explains Aquilino Senra, a nuclear expert from the Federal University of Rio de Janeiro, Argentina. "The Brazilian

nuclear programme is not in a good moment due to budget limits." The three projects are a nuclear power plant for electricity generation, a nuclear reactor for research and production of radioisotopes, and a submarine with nuclear propulsion.

A Need in Africa: With a constantly growing hunger for energy, nuclear power should no longer be a luxury but a need for African nations, says Collins Juma, Chief Executive Officer of the Nuclear Power and Energy Agency (NuPEA), a state corporation in Kenya established under the country's Energy Act 2019. He explains that high cost of development, lack of skilled human resource and little understanding of nuclear technology are

some of the main reasons Africa still lags behind in nuclear energy development. "For a long time, nuclear energy was just a fancy word [to Africa] used by first-world countries, almost alien to the still struggling Africa," Juma tells *SciDev.Net*. "However, with pacesetters such as South Africa, a new path is being forged, with more African

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countries signing up for nuclear technology development programmes.”

South Africa currently stands as the only African country with nuclear power plants, which began operation in 1984 and have been producing about five per cent of the country's electricity. In 2006, the South African government announced plans to build another plant to help meet the ever-growing demand for energy. Ghana, Kenya, Niger, Nigeria and Zambia are some of the African countries already in talks with the IAEA to assess their ability to handle such a responsibility. “About 57 per cent of the Sub-Saharan Africa population has not been electrified, and even for those that have managed to do so, power outages are common due to insufficient supply,” Juma says. Countries such as Kenya, Sudan and Zambia mainly rely on hydroelectricity, and a 2.4-gigawatt nuclear power plant is capable of doubling their electricity supply. Juma explains that with its constantly growing population, Kenya will require at least 17,000 megawatts up from its current 2,705 megawatt of electricity to successfully meet its energy demand by the year 2030. Michael Gatari, director of the Institute of Nuclear Science and Technology, University of Nairobi, Kenya, says that if Africa wants to achieve energy development completely, relying on renewable forms of energy is not enough.

“Solar energy is not sufficient enough to power industries and wind energy will require a lot of acreage of land for sufficient production, which results in destruction of the environment,” according to Gatari. “Today, a lot of industries have had to shut down in Kenya due to inadequate energy supply and some situations have demanded we resort to burning fossil fuel, which is bad for the environment. “A nuclear power plant can last for up to 60 years with very little chances of harming the environment due to its almost zero carbon emission, and it can provide stable and sufficient energy. “Educating the general public on the importance of nuclear energy is also crucial

so that everyone can have an understanding of [it] and embrace what being is brought to them. Diego Hurtado, a researcher and former president of Argentina Nuclear Authority, agrees with Gatari that the land area for renewable energy including wind or solar is “far bigger than the one needed for nuclear energy”, with different studies indicating sizes from a dozen to hundred times more. But Jaime Moragues, from Argentinean Association of Renewables Energy and Environment, disagrees for two main reasons: “You can use the land for agriculture in a wind

power station, and it is also possible to install them in desert places,” he tells *SciDev.Net*. “So it is not good to compare required areas.”

In MENA, Appetite for Electricity: In the Middle East and North Africa (MENA), the picture is quite different. In the meeting round held in Khartoum, Sudan in 2006, the Arab

League expressed its will to develop a nuclear programme for peaceful purposes to develop the region. Although most of the designed programmes in the MENA region have not achieved tangible success throughout the years, the region's need of electricity, securing exports of oil and endorsing economic growth have forced several countries to seek alternatives, one of which is launching or developing nuclear programmes. According to the US Energy Information Administration (EIA) figures, fossil fuels (oil and natural gas) constituted about 97 per cent of fuel necessities for electricity in the region in 2017. Meanwhile, electricity demands are expected to increase by 30 per cent in 2028, almost double the global rate, which is 18 per cent. On the other hand, a report by the World Nuclear Association, released in January 2020, points out that the MENA region has one-third of the 30 countries in the world that have started planning or building their nuclear energy programmes.

Among the most prominent countries that work to advance nuclear capacities through this decade

Among the most prominent countries that work to advance nuclear capacities through this decade are Egypt, Iran, Jordan, Saudi Arabia, Turkey and the UAE. Together, these programmes could increase the nuclear capacity of the region to be more than 14 gigawatts by 2028, scientists say. The United Arab Emirates has been leading other countries in the region after building the first unit of “Barraka” nuclear power plant.

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Ali Abdou, scientific advisor in the nuclear group Halliburton — a private enterprise — believes that nuclear energy has several advantages that makes it an excellent fit for the region. “The energy produced per unit fuel is far more superior to any other form of energy; it is clean, efficient and reliable, which makes it suitable to substitute other forms that are not always available,” he explains to *SciDev.Net*. According to the EIA, carbon emissions in the Middle East reached 2,000 million tonnes in 2017 as a result of burning oil and natural gas. Abdou collaborated with other scientists to build and operate the Egyptian research reactor “EERR-2” in the mid-1990s in Inshas city, northeastern Cairo. He underscores that the reactor has several uses in geological and medical research as well as nutritional and environmental sectors, among others. Egypt signed an agreement with Russia in 2015 to build and operate four nuclear reactors with a total capacity of 4.8 gigawatts in Dabaa city in the country’s Northern West region. The first unit is expected to operate by 2026.

MENA: Uses, Hurdles and Solutions: Ayman Abu-Ghazal, spokesperson of Jordan Atomic Energy Commission, says that “a peaceful Jordanian nuclear programme represents one of the significant exits for the country’s energy crisis”, adding that the country currently imports more than 90 per cent of its needs. Jordan launched its research reactor in 2016 and plans to establish a nuclear plant for generating electricity and processing uranium, the main fuel for nuclear power plants. In this regard, a joint report released by the country’s Nuclear Energy Agency (NEA) and

the IAEA in 2014, states that Jordan has good resources of uranium in comparison to other neighbouring countries. Khaled Debbabi, the president of the Tunisian Association of Nuclear Sciences and Techniques, says that “tensions in the geopolitical environment make the nuclear issue more controversial here than other regions”, adding that countries in the region are skeptical that their neighbours would not use their nuclear programmes for military purposes.

The Iranian nuclear programme had led the international community to impose economic penalties, under suspicion of using the energy for military purposes. This has been followed by years of negotiations until reaching a comprehensive agreement under the auspices of the IAEA in 2015. Nevertheless, the US abandoned the deal in 2018, resulting in increased tensions between the two countries. Iran started increasing its production of enriched uranium, according to IAEA reports, which has further raised some concerns in neighbouring countries. According to Hassan, military usage of nuclear energy would be an incalculable risk, and would lead to compromising potential developmental benefits of nuclear energy.

He cites South Korea as an example in the development of a peaceful nuclear programme, which has advanced its technologies and increasing its exports while North Korea has become isolated and suffering from development problems for choosing to use nuclear energy for military purposes.

Latin America’s Ups and Downs: Of the 450 nuclear reactors around the world, seven are in Latin America. The first in the region was installed in 1974 in Argentina, which today has three reactors (a fourth is being planned). It was followed by Brazil in 1985 (now with a second reactor in operation and a third in construction) and Mexico in 1990 (with a second plant in operation). In addition to electricity generation, other types of nuclear reactors are used in the region for research and applications in medicine and agriculture.

In Brazil and Mexico, nuclear plants generate

about three per cent of the needs of each country's energy. In Argentina the figure arises to up to ten per cent. The Brazilian nuclear power plant for electricity generation — which is expected to produce 1,405 megawatts, a little more than one per cent of the country's needs — was started in 1984. However, since then its construction has been interrupted several times, with only 60 per cent of the plant having been built. Another project behind schedule in Brazil is the multi-purpose reactor for research and production of radioisotopes — active elements of radiopharmaceuticals, which are used as active agents in diagnosing and treating cancer and other diseases. The applications extend to agriculture, industry and the environment. The submarine with nuclear propulsion — the third initiative in Brazil — faces troubles because of the complexity of the technology that is being developed.

“The first complexity is the compacting of equipment to fit in small spaces inside the submarine,” says Senra. “The second is the need to adapt the design to specific characteristics of the submarine according to sea conditions; and the last is the automation of the operation, because with the reduced space on the submarine only few operators can fit.” Despite these challenges, Brazil has a national nuclear programme, including its use for uranium enrichment, and aiming to have autonomy by 2037.

This is an important step because uranium found in nature does not generate energy. Regarding Argentina, Boero highlights that the exports to Egypt, Algeria and India of molybdenum isotopes — good for diagnostic imaging — and “plates with low uranium enrichment, of only 20 per cent, a percentage that is good for peaceful use of

nuclear energy,” could aid development. Elena Maceiras, head of the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials, adds that Peru bought from Argentina a reactor in 1988, which is currently fully operating for use in medicine and agriculture.

Chile, according to her, is evaluating building one for power supply. Currently, the country has two small research reactors. Colombia has had one since 1965 mostly for geological uses. “Chile has all the credentials and possibilities to do it although now it is at a critical political moment because of months of disturbances and popular demonstrations,” she explains.

But some countries in the region planned to invest in nuclear projects with no success. For example, Venezuela signed in 2010 an agreement with Russia to build a nuclear plant but it was cancelled after Fukushima disaster, as announced by the then president Hugo Chavez in March 2011. In Bolivia, under the Evo Morales government, similar plans were made but interrupted after he had to leave the country in 2019 to seek asylum in Mexico.

Different Stages and Concerns: Currently, 171 nations have signed the treaty on the non-proliferation of nuclear weapons. The treaty, which was first signed on 5 March 1970 by China, France, Great Britain, Russia [then called the Soviet Union) and the USA aims to prevent the spread of nuclear weapons and weapons technology, as well as to promote cooperation in the peaceful uses. “The treaty was fundamental to stimulate pacific uses, a key element for strengthen capacity building and development of the signing parties,” says Rafael Grossi, director-general of the IAEA. Nevertheless, catastrophes such as Chernobyl in Ukraine in 1986 and Fukushima in Japan in 2011,

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and other accidents including the reactor leak in Three Mile Island in the United States in 1979, have put spotlights on the risks that the development of nuclear energy can pose for society and the environment.

"Nuclear is not dangerous," Boero tells *SciDev.Net*. "Saying that it is dangerous based on these two or three examples is similar to saying that boats are dangerous because the Titanic has sunk." Still, the safety concerns have been highlighted in many countries in terms of what happens in case of nuclear accidents.

In Latin America, for example, two of the three Argentinean nuclear plants are less than 100 kilometers from Buenos Aires metropolis, which has about one-third of the population of the country. The three Brazilian nuclear plants are located about 160 kilometres from the second biggest city in the country — Rio de Janeiro — and in an area in which the roads are not highways and often face landslides. Another controversial issue is nuclear waste. While some experts express environmental concerns regarding its disposal, nuclear energy defenders argue that this is key in times of climate change because it is an energy that does not release carbon dioxide.

For Maceiras, above nuclear there is always the shadow of policies on nuclear weapons. According to her, they are currently in a "delicate moment", citing "the political situation in the Middle East, nuclear developments in Iran, for instance, and in North Korea, a country accused by the Western world of having nuclear weapons". Every five years, experts meet to assess treaty. The next review conference was due this year in New York on 29 April-10 May but had to be postponed to latest April 2021 because of the COVID-19 pandemic.

The debate about the nuclear developments in Iran and the proposal of United States to impose sanctions on that country because of its uranium enrichment programme were key points of the agenda. In the last review meeting, five years ago also in New York, a final statement was not released because of the lack of consensus among

parties. According to Wilfred Wan, a researcher at the UN Instituted for Disarmament Research, the failure of the 2015 review conference to produce a consensus around the document "can be attributed to the discussions about the establishment of a nuclear weapon-free zone in the Middle East". "These are some of the reasons why the treaty needs a periodical review: to watch that every part is accomplishing their part," Maceiras explained.

Source: <https://www.scidev.net/sub-saharan-africa/nuclear/feature/uneven-use-of-nuclear-programmes-across-regions.html?>, 30 April 2020.

OPINION – Andrea Stricker

COVID-19 and the IAEA: Where does the Iran Mission Stand?

At the height of the COVID-19 outbreak in the Islamic Republic of Iran, the IAEA fell into a worrying slowdown of inspections. Now it is rebounding. IAEA officials say close to full teams of inspectors are flying back and forth from Tehran. IAEA Director General Rafael M. Grossi announced that for the first time in the UN nuclear watchdog's history, it is using chartered jet flights to conduct safeguards visits. One senior IAEA official remarked to his team that he is very pleased with the solution, stating from now on, "The sky is our limit."

These welcome developments come at a time when the IAEA is closely monitoring Iran's consistent reduction of its commitments to the 2015 nuclear deal, or JCPOA. The IAEA reported in March 2020 that Tehran now has adequate low-enriched uranium for more than one nuclear weapon, and is steadily deploying advanced centrifuges to allow it to enrich uranium at a quicker pace.

Simultaneously, the IAEA is undertaking an investigation into Iran's alleged violations of its obligations under the NPT, including denial of access to two sites and refusal to answer questions about another matter. Information from Israeli intelligence led the IAEA in April 2019 to also detect undeclared, refined uranium particles at a site in the Tehran neighbourhood of Turquz-Abad. Iranian officials have yet to explain.

Whether the IAEA is able to continue its important work, including obtaining immediate and unrestricted physical access to nuclear sites, will have serious ramifications for safeguarding Tehran's nuclear activities and clearing up past and possibly ongoing safeguards infractions. The agency will need to guard against any attempts by Iran to avoid tough questions or exploit the health crisis for proliferation purposes.

The IAEA's efforts in Iran currently fall along two separate tracks. It is carrying out an investigation into alleged undeclared nuclear material and activities, while also applying routine safeguards at the Islamic Republic's nuclear facilities. According to the most recent data in the IAEA's Safeguards Implementation Report for 2018, out of 421 total inspections the agency carried out that year in 59 countries, 385 took place at Iran's 21 nuclear facilities. This was in addition to conducting "complementary access" visits to other sites of interest to the IAEA, pursuant to Iran's Additional Protocol. The agency's task of safeguarding Iran's nuclear program is thus significant – and a mission compounded in difficulty by a pandemic.

Over the past two years, the IAEA obtained startling new information from the government of Israel about potentially undeclared nuclear material and activities in Iran. In January 2018, the Mossad seized a vast archive of Iran's nuclear files from locked vaults at a Tehran warehouse. The archive's contents detailed a vast, pre-2003 Iranian program aimed at developing one or two nuclear weapons per year. The information directed the IAEA to new sites, personnel and activities of interest. Even though many of the

activities described occurred long before the negotiation of the JCPOA, some may continue, according to Iranian memoranda among the documents. The archive's information has been corroborated by other governments and non-governmental experts.

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Iran has not reacted well to the discovery, denying the authenticity of the materials. In recent months, however, senior IAEA officials have been meeting with Iranian officials to raise difficult technical questions about those matters, some of which were covered in the March

IAEA NPT safeguards report. This includes Iran's denial of access to the two suspicious sites and its refusal to answer direct questions about those sites and another matter.

So far, IAEA officials privately report, the agency is determined to continue pressuring Iran to approve unrestricted access to the sites. Director General Grossi is also planning a visit toward the end of April to make sure the IAEA's requests are progressing in the right direction. To counter the IAEA's demands, Iran has stated its desire to

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negotiate a "roadmap" toward eventually discussing the agency's requests to visit the two sites and related topics. Seeing this as a stalling tactic, according to the IAEA officials, the agency told Iran that it is only willing to discuss specific technical and logistical matters connected directly

to the visit parameters and continues to demand immediate, unrestricted access.

Tehran has used similar stalling tactics in the past, which typically have two main goals. The first is to buy time to allow officials to "organize" the suspect sites – actually sanitization efforts

entailing cleaning, moving away of materials and machines, and scraping or covering earth to defeat IAEA environmental sampling. Iran has undertaken such efforts at multiple other sites in the past, and most recently at the Turqz-Abad warehouse where the IAEA found uranium.

Iran's other goal is to indicate that cooperation with agency investigations is forthcoming, hoping that meanwhile, pressure from the IAEA Board of Governors would diminish. Such tactics are frequently successful with the Russians and Chinese.

Notably, the IAEA's NPT compliance investigation in Iran is a renewed one, restarted following the installation of a new director general last December. The JCPOA mistakenly closed an earlier investigation into the military dimensions of Iran's nuclear activities. It is on this basis that Iran now denies that it must answer any of the IAEA's questions about its past. After the March COVID-19 slowdown began, the agency is reportedly back in action in Iran to routinely apply safeguards. It appears to have returned to a near-normal pace of conducting physical inspections in the Islamic Republic after overcoming several obstacles.

Source: <https://www.jpost.com/opinion/covid-19-and-the-iaea-where-does-the-iran-mission-stand-625960>, 26 April 2020.

OPINION – Hal Brands

China has No Reason to Make a Deal on Nuclear Weapons

U.S. Secretary of State Mike Pompeo has informed his Russian counterpart, Sergei Lavrov, that any future agreement on nuclear-arms control

between the US and Russia must also include China. This shift to trilateral negotiations is part of the Trump administration's effort to remake great-power arms control for a new era.

It's a reasonable approach, which accurately holds that the old bilateral formula has become disconnected from reality. Whether the U.S. can build the leverage necessary to make this new approach succeed — particularly vis-a-vis China

— is far less certain.

The Trump administration, in pursuing this strategy, is breaking with two prior arms control paradigms. The Cold War model focused on stabilizing the competition between Moscow and Washington by capping the size of their nuclear arsenals and limiting their pursuit of the most destabilizing systems. The post-Cold War approach focused on cleaning up the strategic residue of the superpower conflict — namely, by reducing U.S. and Russian arsenals.

The most recent such agreement was New START, signed in 2010. That pact trimmed the number of deployed strategic nuclear warheads to

roughly 1,550 on either side; it limited the U.S. and Russia alike to 700 deployed intercontinental ballistic missiles, submarine-launched ballistic missiles and nuclear-capable heavy bombers.

Over time, however, two developments degraded the strategic value of the second paradigm. First, the Russians stopped honouring key agreements while also carrying out a major nuclear-modernization program. In 2018, the U.S. Defense Department reported that Moscow was violating several nuclear and conventional arms control pacts.

The JCPOA mistakenly closed an earlier investigation into the military dimensions of Iran's nuclear activities. It is on this basis that Iran now denies that it must answer any of the IAEA's questions about its past. After the March COVID-19 slowdown began, the agency is reportedly back in action in Iran to routinely apply safeguards.

U.S. Secretary of State Mike Pompeo has informed his Russian counterpart, Sergei Lavrov, that any future agreement on nuclear-arms control between the US and Russia must also include China. This shift to trilateral negotiations is part of the Trump administration's effort to remake great-power arms control for a new era.

Most important was the INF Treaty of 1988, which Russia broke by developing and deploying ground-launched missiles of a prohibited range. This left the U.S. as the only country in the world that was effectively constrained from building ground-launched missiles — conventional or nuclear-tipped — with a range between 500 and 5,500 km. After the Obama administration spent several years trying to bring Moscow back into compliance, the Trump administration withdrew from the treaty last year.

Second, the old approach ignored the rise of China. Since Beijing was not a party to the INF Treaty, it was free to assemble a fearsome arsenal of intermediate-range missiles to target U.S. bases, ships and allies in the Western Pacific. Washington, as part of the agreement with Russia, was unable to respond by deploying such missiles of its own. As the U.S. reduced its nuclear inventory, moreover, China began to build up its comparatively modest arsenal.

In 2019, the head of the U.S. Defense Intelligence Agency observed that Beijing “is likely to at least double the size of its nuclear stockpile” over the next decade. The U.S. increasingly found that existing control agreements did not correspond to a changing strategic situation — and even weakened its position vis-a-vis Beijing.

Pompeo’s recent remarks hint at the administration’s response to this problem. By withdrawing from the INF Treaty, the administration has sought to free the U.S. from agreements that inhibit its ability to compete with Russia or China. By signalling that it expects future agreements to be trilateral, the administration is serving notice that it will no longer give China a free pass.

And by recommitting to a major nuclear modernization program that dates back to the Obama administration — while also pursuing

innovations such as lower-yield nuclear weapons meant to strengthen the credibility of the American deterrent — the administration is trying to build the pressure that might allow for more advantageous arms control deals in the future. Before the U.S. can build down, in other words, it will have to build up.

There is some sound strategic logic here. It makes little sense to forever gear the U.S. arms control agenda to the challenge posed by Russia when China is now the primary competitor. Although both Russia and China are improving their nuclear arsenals, neither presumably wants a prolonged strategic competition with an unconstrained, economically superior U.S.

Withdrawal from the INF Treaty was not as damaging to the unity of NATO as some observers feared at the time; there are early signs that U.S.

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allies in the Asia-Pacific might eventually be willing to host INF-range missiles (probably conventional rather than nuclear). Most important, the Trump administration’s approach reflects an understanding of the paradoxical logic of arms control — that intensifying an arms race is often a

precondition to de-escalating it on favourable terms.

Nonetheless, the administration faces some real challenges. For one, China currently has little reason to enter a trilateral agreement on either intercontinental or intermediate-range systems, precisely because it enjoys many of the benefits of arms control with few of the liabilities.

The U.S. could, over time, give China a reason to cooperate, by showing that its position will worsen as America deploys INF-range systems in the Asia-Pacific and modernizes its own arsenal. Unfortunately, the U.S. modernization program has been delayed repeatedly, and its future seems uncertain given the potential for COVID-19 to devastate the defense budget as it has devastated the economy. If Trump or a future Democratic

president comes to see the U.S. arsenal as a source of budgetary savings, America may end up lacking the leverage needed to force its competitors to the table.

Second, a trilateral framework brings dangers as well as advantages. That format might allow Washington to subtly drive a wedge between Russia and China, by reminding Moscow that the nuclear domain is virtually the only area in which it is still superior to Beijing. Yet that format might also create opportunities for two U.S. rivals to gang up on Washington in the negotiations, a ploy Russia and Iran seem to have run in the talks leading to the 2015 agreement on Tehran's nuclear program. One way or another, managing three-way negotiations will require intricate, disciplined diplomacy, a task to which Trump isn't well-suited.

A third challenge relates to the nearer-term decision on whether to extend the expiring New START with Russia for another five years, until 2026. Russian President Vladimir Putin has said he is willing to do so; the Trump administration has so far refused to commit. The calculation may be that holding out increases U.S. diplomatic leverage over Moscow, while allowing the U.S. to establish the principle that future negotiations must shift to a three-way format with China. Yet it isn't entirely clear who would benefit if the treaty actually lapses. In theory, both sides would then be free to build beyond New START's limits. In practice, both sides would face constraints.

Russia has a head start, in the sense that its missile production lines are already hot. But Moscow is also experiencing a severe cash crunch from collapsing oil prices in addition to pre-existing economic stagnation: These trends will hamper its modernization or force sharp trade-offs against other priorities sooner or later. The

U.S. has far greater economic capacity, but its modernization program will not gather real momentum until well into the 2020s or even the 2030s, assuming it isn't set back further by post-coronavirus fiscal austerity. Over the long term, an intensified arms race surely favours the U.S.

In the near term, the outlook is murkier. The Trump administration is right to start looking beyond old arms-control frameworks of diminishing strategic value to the U.S. Moving from those frameworks to something better will be the big challenge for Trump and, one suspects, his successors.

Source: <https://www.japantimes.co.jp/opinion/2020/05/01/commentary/world-commentary/china-no-reason-make-deal-nuclear-weapons/#.XrnOCC9h1o4>, 01 May 2020.

A trilateral framework brings dangers as well as advantages. That format might allow Washington to subtly drive a wedge between Russia and China, by reminding Moscow that the nuclear domain is virtually the only area in which it is still superior to Beijing. Yet that format might also create opportunities for two U.S. rivals to gang up on Washington in the negotiations, a ploy Russia and Iran seem to have run in the talks leading to the 2015 agreement on Tehran's nuclear program.

OPINION – Christer Viktorsson

Covid-19: Nuclear Industry Needs to Innovate

Since the outbreak of the Covid-19 in December 2019, and the WHO declared it as a pandemic in March, it has triggered shock waves across the globe locking down over 190 countries and affecting everyday life. The world is experiencing unprecedented challenges. The pandemic has profoundly disrupted businesses, trade, education, industries, investments and other sectors. The IMF estimates the world economy loss to be around \$9 trillion in 2020-2021. Multilateral cooperation is needed more than ever to contain the pandemic and mitigate its far-reaching consequences.

The nuclear industry is no exception. Before I elaborate on the impact on the nuclear industry and propose solutions, it is important to mention the essential role of the nuclear energy in producing electricity that is needed to support health care facilities to address the patients'

needs and help first responders in their efforts to curb the spread of the virus. There are 450 nuclear power plants in operation globally, producing roughly 10% of global electricity and 53 others under construction in 19 countries. Since the outbreak started in December 2019, governments and international organisations around the world took precautionary measures to mitigate its impact. Many nuclear power plants operators and regulators have been affected by the current measures, leading to a drop by 10-20% in electricity generation, according to World Nuclear Association. In many countries, nuclear employees have been identified as among the key workers that are essential to maintaining important infrastructure. Some nuclear plant operators are taking various actions to protect their workforce and implementing business continuity plans. Activities on construction sites are being reduced or stopped, and new working practices introduced.

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In UK, staff numbers have been reduced by more than half in the Hinkley Point C nuclear plant, which is under construction. In China, work was halted on some reactors under construction in response to the pandemic. As work gradually resumes, countermeasures are being introduced for the employees returning to site. In US, Duke Energy (which operates 11 reactors), nuclear reactors are being impacted by staff shortage. They have adopted some actions such as screening measures at reactors as well as working remotely.

for work-hour limits and permitting reduced staffing, alongside enabling operators to offset work hours, revise shift patterns, implement alternative ways of communicating with control room personnel, and asking essential staff to live on site temporarily.

Altered Activities: For the UAE Barakah Nuclear Power Plant, both the Emirates Nuclear Energy Corporation (ENEC) and its operating and

maintenance subsidiary, the Nawah Energy Company (Nawah), have embedded specific COVID-19 safety measures throughout their operations and altered their activities on-site. These measures include reducing the number of workers on site at the plant, enforcing social distancing guidelines, establishing thermal monitoring at access points, and pausing work on Units 2, 3 and 4 for an initial period of two weeks to minimise the working population and subsequent transmission risk within Barakah.

Such impacts are visible among various international nuclear regulatory bodies, who work to ensure the safety of the public by regulating the industry. The United States NRC has taken the innovative step of permitting lower-risk licensing activities and facility walk-throughs to be conducted over video calls accompanied by the electronic submission of documents. In addition, NRC has been exploring opportunities to issue regulatory exemptions, amendments to license conditions and technical specifications, and loosening its enforcement mechanisms where deemed possible.

Safety Precautions: Meanwhile, the UK's Office for Nuclear Regulation (ONR), the Finnish Radiation and Nuclear Safety Authority (STUK), the Canadian

Nuclear Safety Commission (CNSC), and other regulatory authorities around the world have already begun issuing exemptions for work-hour limits and permitting reduced staffing, alongside enabling operators to offset work hours, revise shift patterns, implement alternative ways of communicating with control room personnel, and asking essential staff to live on site temporarily. While, it is challenging to be physically available at sites, such measures are critical for the regulators to take in coordination with operators

to ensure safety of staff and continuity of the business to address increasing needs of the community at these times.

For the UAE, the Federal Authority for Nuclear Regulation (FANR) adopted the federal government directions to curb the virus spread by activating its Business Continuity Management Plan and setting a crisis management COVID-19 Task Force, which have implemented a range of measures across the organisation. These include the obvious, such as mandating employees to work remotely to the more technical steps of reducing the number of resident inspectors on site at the Barakah Nuclear Energy Plant and the exploration of innovative new ways to conduct inspection and enforcement activities remotely through digital means. Moreover, FANR is conducting only crucial inspections at facilities that use nuclear or radioactive materials. Over the past three years, FANR developed and implemented a Web-based e-Services for licensees authorised by FANR to conduct activities involving radioactive sources and radiation generators. The e-Service allows issuing licences to conduct regulated activities including import and export. The COVID-19 crisis has demonstrated the efficiency and the effectiveness of this e-Service.

Impact of Covid-19: The impacts of Covid-19 have not only affected nuclear operators and regulators, but also reached the remaining of the nuclear fuel cycle such as uranium mining, waste management and decommissioning, where many activities came to a halt to protect the workforce from contracting the virus. When we look at the IAEA, it is playing an important role to stem the pandemic: it has recently dispatched nuclear-derived detection techniques to few countries to help tackling the spread of the novel coronavirus.

When we look at the IAEA, it is playing an important role to stem the pandemic: it has recently dispatched nuclear-derived detection techniques to few countries to help tackling the spread of the novel coronavirus. The IAEA is supporting its 171 Member States by establishing the COVID-19 Operational Experience Network to facilitate knowledge exchange, and the collection of relevant practices among its members.

The IAEA is supporting its 171 Member States by establishing the COVID-19 Operational Experience Network to facilitate knowledge exchange, and the collection of relevant practices among its members. It postponed some of its conferences such as the Review Meeting of the Contracting Parties to the Convention on Nuclear Safety and other cooperation activities and is planning to conduct some of them virtually.

No doubt, the Covid-19 pandemic is an unprecedented crisis in our modern times. The current situation made governments and international organisations consider new ways to conduct the business and protect the communities. We need to turn the recovery into an opportunity

to safeguard the future. The nuclear stakeholders, whether operators or regulators, should find solutions and develop concrete strategies to regulate the industry in the aftermath of the pandemic. It is important to work together to identify lessons learnt.

Lessons of Chernobyl: The nuclear industry learnt a number of lessons after the Chernobyl in 1986, some of

which we are now benefiting from. We established new institutions and conventions and enhanced international cooperation and coordination. We introduced measures of transparency and international peer review mechanisms. We established various ways to control trade and borders to ensure safety of the public. And we enhanced significantly the preparedness and response mechanisms to nuclear and radiation crises. The culture of moving to crises mode is nothing new to the nuclear regulators. These and other measures have all been of use these days, but new lessons are going to be drawn, such as how regulators will conduct inspectors remotely, the need to revisit current regulations to take pandemics into consideration, and in establishing smart licensing procedures and systems.

We need to rethink ways of working with nuclear

power plants under construction in light of a pandemic. Multilateral cooperation is needed more than ever to contain the pandemic and mitigate its far-reaching consequences. We need innovations more than ever!

The JL-2 (NATO reporting name CSS-N-14) is a Chinese second-generation intercontinental-range SLBM deployed on the People's Liberation Army Navy's (PLAN) Type 094 submarines. It succeeds the JL-1 SLBM deployed on the Type 092 submarine.

Source: <https://gulfnews.com/opinion/op-eds/covid-19-nuclear-industry-needs-to-innovate-1.71314480>, 04 May 2020.

NUCLEAR STRATEGY

CHINA

Chinese Navy has Now Six Type 094A Jin-class Nuclear Powered Ballistic Missile Submarines

According to a report of the U.S. Office of Naval Intelligence published in 2015, the JIN-class SSBN is poised to begin strategic patrols in the near future, for the first time, putting Chinese intercontinental range ballistic missiles to sea. According to Naval military open sources, the Type 094 nuclear powered submarine is approximately 137 meters long. It is equipped with 12 missile tubes, each capable of firing the JL-2 SLBM (Submarine Launched Ballistic Missile), which carries between one to three nuclear warheads to an estimated range of 7,200 km. The JL-2 is derived from the DF-31 ICBM. The JL-2 (NATO reporting name CSS-N-14) is a Chinese second-generation intercontinental-range SLBM deployed on the People's Liberation Army Navy's (PLAN) Type 094 submarines. It succeeds the JL-1 SLBM deployed on the Type 092 submarine.

According to the U.S. Department of Defense's 2019 annual report on Chinese military capabilities, China has built six Type 094, or Jin-class, nuclear ballistic missile submarines (SSBN), with four operational and two outfitting at Huludao Shipyard. The Type 094A is a variant with a modified and

A clear-eyed reassessment of China as a nuclear power is timely now because Beijing's forces are expected to double in size over the next decade. China is shifting to a full-blown triad of ICBMs, submarine-launched ballistic missiles and bombers, much as the US has had since the 1960s.

improved sail. The sail appears to incorporate features from one installed on a modified Type 093. It could be equipped with 16 launch tubes, while Type 094 had only 12 launch tubes. Pictures published in 2015 to Chinese website, the Type 094A

has a more prominent "hump" in the missile bay aft of the sail as well as other changes in the contours of the body. The Type 094A has a retractable towed array sonar (TAS) mounted on the top of its upper tailfin, which would make it easier for the craft to "listen" for threats and avoid them. The Type 094A version could be equipped with new ballistic missile Julang-2A (JL-2A) which has a greater range than the JL-2. The new missile could reach virtually the entire United States from Yulin Naval Base in Hainan Island.

Source: <https://navyrecognition.com/index.php/news/defence-news/2020/may-2020/8344-chinese-navy-has-now-six-type-094a-jin-class-nuclear-powered-ballistic-missile-submarines.html>, 02 May 2020.

Caution: China's Nuclear Strategy May be 'Nuclear Thoughtlessness'

China's nuclear strategy is more complex than most public discussions or academic studies suggest.

Most of these treat China as a growing "missile farm" with intercontinental ballistic missiles. This view is not irrelevant, but it misses the most important dangers of China in this second nuclear age.

A clear-eyed reassessment of China as a nuclear power is timely now because Beijing's forces are expected to double in size over the next decade. China is shifting to a full-blown triad of ICBMs, submarine-launched ballistic missiles and bombers, much as the US has had since the

1960s. This has many new implications — for example, command and control now must manage mobile weapons, something far removed from China's "classic" minimum deterrent force of a few missiles.

There are three especially significant aspects to China's nuclear build-up. First, the crisis management behaviour of this force is likely something the Chinese themselves do not understand. Crises are defined more by uncontrollable factors than doctrine. The whole point of crisis management is to understand, as best we can, what these behaviours look like. For example, nuclear alerts now mean moving live weapons around at sea, on the ground and in the air — a juggling act that can lead to many surprises for which there is no doctrine.

Second, there are foreign policy implications to the Chinese build-up. The role of nuclear weapons is not only to deter war, but to influence the behaviour of other nations in peacetime. Japan, India, Australia and South Korea are not going to dismiss the Chinese build-up. Moreover, actions far short of war — threats, alerts, flyovers of nuclear-capable bombers — bolster national resolve. This is precisely how nuclear weapons were used in the Cold War. China's nuclear build-up will shape the postures of the US, Japan, India, Russia and others. "Rocking the boat" in Asia will look much different in a "heavy" nuclear world than it did when China was barely a nuclear weapon state.

Finally, China's nuclear strategy doesn't cover a wide range of possible scenarios beyond what it was built for. It may be very good (or not) in "standard" scenarios, such as deterrence involving Taiwan or anti-access conflicts aimed at keeping U.S. forces out of the western Pacific. But it may lead to a systems failure in non-standard wars. It is important for the US to get a handle on these non-standard wars and what shape they may take. China's leaders are likely

subject to "nuclear thoughtlessness," just as leaders in Washington and Moscow were during the Cold War.

An understanding of China's nuclear strategy needs to appreciate the geopolitics of nuclear arms. China was "born" into a threatening nuclear world that it didn't control. Beijing had to play in the nuclear big leagues with two superpowers when China was neither nuclear nor a superpower. It had no technology to deal with its immediate enemy, the US. Washington threatened China with a nuclear attack to end the Korean War, and Beijing could do nothing to counter this. In the 1958 Taiwan crisis, China had to back down in the face of U.S. threats. Beijing thought it had nuclear protection from Moscow against

Washington, but quickly learned otherwise. Moscow refused to extend its nuclear umbrella to protect China against an atomic enemy. Worse, China was left high and dry when Russia abruptly withdrew technical assistance to build a bomb.

This experience was the stimulus for their own nuclear weapon. By the late 1960s, when China had its own bomb, these two "allies" almost came to blows. China even put its nascent 1969 force on nuclear alert, not against Washington but against Moscow.

Today the "Taiwan crisis" refers less to past events than to present-day historical feelings of humiliation, the dangers of dependence, and technological backwardness. The Taiwan crisis has become a metaphor, a story, about these sentiments. The power of historical metaphor is considerable. Think of the powerful grip that "Munich" had on U.S. policy in the Cold War. The Cuban Missile Crisis is still a controlling metaphor for U.S. nuclear operations. The politics and technology of that crisis are ancient, but the crisis remains a model of calculated risk management and de-escalation.

Another geopolitical reality that many analysts overlook is that China is the only major power

An understanding of China's nuclear strategy needs to appreciate the geopolitics of nuclear arms. China was "born" into a threatening nuclear world that it didn't control. Beijing had to play in the nuclear big leagues with two superpowers when China was neither nuclear nor a superpower.

surrounded by five nuclear weapon states. Three of these — Russia, North Korea and Pakistan — are its “allies,” but only in a technical sense. To suggest that Chinese relations with any of them are like the US and its European allies is to misunderstand the danger that China faces. “Allies” such as these are more likely to bring catastrophe on China than the US is. Every one of them has targets inside China for their nuclear weapons — just as China surely has targets in North Korea, Pakistan and elsewhere.

Having studied China’s military doctrine, I find no evidence of seriously thinking through the dynamics of such non-standard conflicts. It surely doesn’t show up in high-level speeches. Major fault lines easily could develop in this alliance, not unlike the fault line between the Soviet Union and Eastern Europe.

Finally, technology is changing in ways that spill over into China’s nuclear strategy. Beijing has moved out smartly in building advanced technologies for reconnaissance, prompt strike and intelligence. The complexity of this system is extraordinary; it is one of the drivers behind China’s push into artificial intelligence. The complexity is so great, and the timing for tracking mobile targets so tight, that only an AI-driven system can absorb the voluminous data and direct the responses. Advanced technology is spilling over into the nuclear arena. The most systemically important targets for China are other people’s nuclear weapons — the US, obviously, but also India, Russia, North Korea and Pakistan. The interactions of this reconnaissance-nuclear system are tightening. That these couplings are overlooked doesn’t make them unimportant. It only means that technology — once again — is racing ahead of strategy. A broader assessment of China’s nuclear strategy is needed. China no longer is a rising power with around 20 ICBMs, a minimum deterrent. The days of looking at it as a “simple” missile exchange are long gone. China’s nuclear

strategy has more far-reaching effects on peace and war than the stick man theories that are usually offered to describe it. The chance that the strategy is itself dangerously mis-designed for the political and technological contours ahead must be taken seriously in any sober assessment of international security.

Source: Paul Bracken, <https://macmillan.yale.edu/news/caution-chinas-nuclear-strategy-may-be-nuclear-thoughtlessness>, 08 May 2020.

CHINA–USA

China-US War Unlikely Despite Rising Hostility

The failed handling of the COVID-19 outbreak in the US has fuelled Washington’s hostility toward China and escalated concern that worsening bilateral ties might lead to a China-US war, prompting Chinese experts to assert that Beijing has sufficient nuclear capacity to assure MAD and create deterrence to reduce the risks of any direct conflict. Intention and capability are two elements for judging whether or not the US wants a war with China, Chinese observers noted. A series of “anti-China” expressions by some senior US politicians that assign blame for the pandemic have provoked discussion about the potential for a nuclear war with China. Chinese experts say it remains unclear what is the real intention behind the hostile narratives of US policymakers about China.

To strengthen China’s nuclear arsenal was an essential way to deter hawkish and warlike US policymakers from making dangerous moves, the experts believed. But in order to effectively prevent a war between China and the US, they urged Washington to abandon its war of words that poisons bilateral ties and risks a miscalculation of US intent by China.

US hawks should understand China is capable of bringing destructive consequences to them after

Advanced technology is spilling over into the nuclear arena. The most systemically important targets for China are other people’s nuclear weapons — the US, obviously, but also India, Russia, North Korea and Pakistan. The interactions of this reconnaissance-nuclear system are tightening.

China detects a nuclear attack from the US, warned Chinese military experts. No one wants to see that kind of doomsday tragedy, they added. CNN commentator Fareed Zakaria expressed a similar kind of concern. "Mike Pompeo, Donald Trump are trying to pressure the intelligence community to say we have some kind of smoking gun with regard to China. And this is the kind of politicized intelligence that led to the mistakes of the Iraq war" he said at CNN Tonight. "Again, Pompeo or Trump is trying to plat washing powder," responded one tweet about the show.

Mike Pompeo, Donald Trump are trying to pressure the intelligence community to say we have some kind of smoking gun with regard to China. And this is the kind of politicized intelligence that led to the mistakes of the Iraq war.

The tweet was referring to the former US secretary of state Collin Powell showing "evidence" of Iraqi WMD at the UN in an attempt to legitimize a war against Saddam Hussein's regime. Some joked the "evidence" could be a small pot of washing powder as the WMD accusation later proved a catastrophic intelligence failure.

Nuclear Deterrence: In response, Hua Chunying, a spokesperson of the Ministry of Foreign Affairs, posted on Twitter that "China won't be Iraq." Some Chinese Net users noted that the most important reason China wouldn't be another Iraq was China has real WMDs.

On the one hand, China should prepare for all possibilities but on the other, there was no need to overemphasize preparation for war, Diao said. That might speed up the arms race with the US, he warned.

Hu Xijin, editor in chief of the *Global Times*, reinforced his call for China

to strengthen its nuclear arsenal to deter the US on China's Twitter-like Sina Weibo platform on 09 May after his post called on China to build more nuclear warheads and DF-41 ICBMs. Hu said in the past, China might have had enough nuclear power to deter the US, but now, as the US is treating China as its major or even top strategic competitor and strengthening the US arsenal, so China's nuclear strength should not stay indifferent.

Hu said he was a "peace lover" but peace has never come from "nice words and begging."

His two posts on 08 May and 09 May received about 300,000 likes on Sina Weibo. Lü Xiang, a research fellow on US studies at the Chinese Academy of Social Sciences in Beijing, told the *Global Times* nuclear concerns were entirely reasonable as the US intention to treat China as an enemy was increasing in its statements and in the behaviour of senior politicians like Pompeo and White House adviser Pete Navaro, even President Donald Trump.

"The key for us to judge the decision-making from the US is to analyse the real intention behind extreme and hostile words from the White House," he said. "The performance of the Trump administration forced Chinese elites and the public to think more about the worst scenario." The two countries were still far from a direct military conflict, said Diao Daming, a US studies expert at the Renmin University of China in Beijing.

On the one hand, China should prepare for all possibilities but on the other, there was no need to overemphasize preparation for war, Diao said.

That might speed up the arms race with the US, he warned. "The US is unilaterally executing major power competition, and due to US-launched stigmatization against China on the COVID-19 pandemic, China-US

relationship is experiencing a profound change," Diao said. "Although the cooperation part of the bilateral ties still exists, the competition part is increasing sharply." Jin Canrong, the associate dean of Renmin University of China's School of International Studies in Beijing, expressed his concern over China-US decoupling. "The decoupling unilaterally pushed by the US side risks increasing strategic conflicts between the two major powers, and Taiwan, the South China Sea and the Korean Peninsula could become potential conflict zones."

Mutually Assured Destruction or Development:

Chinese experts on nuclear weapons and arms control said there was no need to doubt China's nuclear strength and strategic deterrence. They called on the Chinese public to remain calm as the US noticed clearly that China has enough to ensure mutually assured destruction. Yang Chengjun, a Chinese expert on missile technology and nuclear strategy and chief scientist of quantum defense, told the *Global Times* that a core principle of China's nuclear policy was not to seek a warheads arms race. China's nuclear warheads were fewer than 1,000, Yang said but Beijing was totally capable of building more warheads if necessary. "Although we have fewer warheads than the US, but once we detect any nuclear attack from the US, our warheads are enough to destroy the US in the counterattack. This is the effective nuclear deterrence," Yang said. An anonymous military expert at a Beijing-based military academy said "increasing the number of warheads is a measure to increase the effectiveness of nuclear deterrence, as the US has missile defense system."

China needed to make the US believe it could effectively destroy its cities despite the US missile defense system, the anonymous expert said. "To improve the technology of defense penetration ability of our ICBMs is also a way." Xu Guangyu, a senior adviser to the China Arms Control and Disarmament Association, told the *Global Times* that there was a common sense understanding among the five permanent member states of the UN Security Council, also the five major nuclear powers, that a nuclear war between any would "bring a doomsday tragedy to humanity." War normally occurred when one side has an overwhelming advantage, Xu noted. "The US doesn't have that against China or Russia. What China needs to do, from the perspectives of military and technology, is to keep the US away from the overwhelming advantage." "There is another 'MAD' - mutually assured 'development,'

instead of 'destruction.' If the two countries can realize this, the danger of war would be largely controlled," Lü said.

Source: Yang Sheng, [https:// lobaltimes.cn/content/1187947.shtml](https://lobaltimes.cn/content/1187947.shtml)www.g, 10 May 2015.

GENERAL

World Nuclear Arms Spending Hit \$73bn Last Year – Half of it by US

The world's nuclear-armed nations spent a record \$73bn on their weapons last year, with the US spending almost as much as the eight other states combined, according to a new report. The new spending figures, reflecting the highest expenditure on nuclear arms since the height of the cold war, have been estimated by the ICAN, which argues that the coronavirus pandemic underlines the wastefulness of the nuclear arms race.

The nine nuclear weapons states spent a total of \$72.9bn in 2019, a 10% increase on the year before. Of that, \$35.4bn was spent by the Trump administration, which accelerated the modernisation of the US arsenal in its first three years while cutting expenditure on pandemic prevention.

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"It's clear now more than ever that nuclear weapons do not provide security for the world in the midst of a global pandemic, and not even for the nine countries that have nuclear weapons, particularly when there are documented deficits of healthcare supplies and exhausted medical professionals," Alicia Sanders-Zakre, the lead author of the report, said.

The report comes at a time when arms control is at a low ebb, with the last major treaty limiting US and Russian strategic nuclear weapons, New Start, due to expire in nine months with no agreement so far to extend it.

Russia, which has announced the development of an array of new weapons – including nuclear-

powered, long-distance cruise missiles, underwater long-distance nuclear torpedoes and a new heavy intercontinental ballistic missile – spent \$8.5bn on its arsenal in 2019, according to Ican's estimates. China, which has a much smaller nuclear force than the US and Russia but is seeking to expand, spent \$10.4bn.

Those expenditures were far overshadowed by the US nuclear weapons budget, which is part of a major upgrade also involving new weapons, including a low-yield submarine-launched missile, which has already been deployed.

According to the Congressional Budget Office, the cost of the US programme over the coming decade will be \$500bn, an increase of nearly \$100bn, about 23%, over projections from the end of the Obama administration. Congressional Democrats failed in an attempt to curb the administration's nuclear ambitions, but Kingston Reif, the director for disarmament and threat reduction policy at the Arms Control Association, said budgetary constraints in a coronavirus-induced recession, could succeed where political opposition failed. ...

Source: Julian Borger, <https://www.theguardian.com/world/2020/may/13/nuclear-weapons-world-record-spending>, 13 May 2020.

GERMANY

Germany's Support for Nuclear Sharing is Vital to Protect Peace and Freedom

The Coronavirus is among the greatest threats the world has faced since the Second World War. However, that does not mean that others have gone away. We face the most difficult security environment for a generation. Around the world, terrorism continues, authoritarian regimes

challenge liberal democracies, and we see the proliferation of nuclear weapons to countries like North Korea, as well as the continuing aggressive actions by Russia.

According to the Congressional Budget Office, the cost of the US programme over the coming decade will be \$500bn, an increase of nearly \$100bn, about 23%, over projections from the end of the Obama administration.

In recent years, Russia has invested significantly in its military capabilities, and especially in its nuclear arsenal. While NATO views its own nuclear deterrent primarily as a political tool,

Russia has firmly integrated its nuclear arsenal into its military strategy. It has placed nuclear-capable missiles in Kaliningrad, just 500km from Berlin. It has threatened Allies such as Denmark, Poland and Romania with nuclear strikes. Russia also forcibly and illegally annexed part of Ukraine, a country whose borders it had previously committed to respect in return for Ukraine giving up its own nuclear protection.

In stark contrast, NATO seeks a world without nuclear weapons through effective arms control, disarmament and non-proliferation. And we have made great progress in achieving this. Since the end of the Cold War, NATO has reduced the number of nuclear weapons in Europe by around 90%. That is significant.

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Despite Russia's flagrant breach of the INF Treaty with the deployment of a new intermediate range missile, which can reach European capitals with little warning, NATO has made clear that we have no intention of pursuing our own land based nuclear missiles in Europe. We will maintain an effective deterrence and defence, including through our existing nuclear deterrent.

Therefore, I welcome Germany's clear commitment to NATO and our nuclear deterrent. This is even more significant since we have just marked the 75th anniversary of the end of the Second World War in Europe. Our Alliance was built on the ruins of that devastating war, to ensure

peace and freedom for future generations. Germany joined our Alliance just 10 years after the war ended, on May 6, 1955. Since then, you have been a valued member of the NATO family, with all the benefits and responsibilities that implies.

Our nuclear deterrence remains a vital part of keeping our peace and freedom. It is for the security of the whole alliance, for Germany, its neighbours, friends and Allies, who all have legitimate security concerns and who are all protected by NATO's nuclear deterrent.

An important part of our nuclear deterrence strategy is nuclear sharing. NATO's nuclear sharing is a multilateral arrangement that ensures the benefits, responsibilities and risks of nuclear deterrence are shared among Allies. Politically, this is significant. It means that participating Allies, like Germany, make joint decisions on nuclear policy and planning, and maintain appropriate equipment. It has also always been an important trust-building measure for Germany's neighbours. Our common procedures, doctrine and exercises give Allies a voice on nuclear matters that they would not otherwise have.

NATO's nuclear sharing arrangements also directly support non-proliferation. For many decades, it has provided European Allies with an effective nuclear umbrella. This was essential for the development of the Nuclear Non-Proliferation Treaty, which prevents the spread of nuclear weapons, as it removed the incentive for nations to develop their own nuclear capability. If our nuclear sharing arrangements came to an end, more countries may again seek their own nuclear weapons. This would result in a world this is less safe, not more.

All Allies appreciate Germany's role in NATO's nuclear sharing arrangements. Germany has contributed dual-capable aircraft for NATO's

nuclear mission since the beginning. It provides important leadership based on decades of experience working together with other Allies. To provide security for all our Allies it is essential that those who participate in nuclear sharing do so fully. This includes having capable aircraft that can support our nuclear deterrence mission.

NATO unites democratic nations in defence of our values - freedom, liberty and the rule of law. The commitment of NATO Allies to each other's security remains rock solid. Our solidarity is our strength and the ultimate expression of that solidarity remains our nuclear deterrent.

The purpose of NATO's nuclear weapons is not to provoke a conflict but to preserve peace, deter aggression and prevent coercion. Our Alliance seeks a world without nuclear weapons, sadly, these conditions do not exist today. A world where Russia, China and others have nuclear weapons but NATO has none, is simply not a safer world.

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Russia, China and others have nuclear weapons but NATO has none, is simply not a safer world. That is why all Allies have agreed that as long as nuclear weapons exist, NATO will remain a nuclear Alliance.

Source: Jens Stoltenberg, NATO Secretary General, https://www.nato.int/cps/en/natohq/opinions_175663.htm, 11 May 2020.

JAPAN

Does Japan Have Nuclear Weapons?

Japan does not have its own nuclear weapons. The Japanese government considered developing them in the past, but decided this would make Japan less secure. Japanese opinion polls consistently express strong public opposition to nuclear weapons. So do their elected representatives. There is, however, a small group of non-elected Japanese bureaucrats with close ties to the U.S. defense establishment who insist U.S. nuclear weapons should be "the core of Japan's security arrangements." Wonks

refer to this supposed core as “extended nuclear deterrence.” Journalists and politicians, especially in Japan, call it a “nuclear umbrella.”

Target Practice: The first time Japanese officials were allowed to see how this umbrella works was in 1957 during a military exercise. A large fleet of Soviet bombers were supposed to attack U.S. military bases in Japan. U.S. forces simulated launching nuclear weapons into the skies over Japan to wipe them out. The Japanese officials invited to this exercise must have been horrified. They sent a letter to the U.S. Joint Chiefs of Staff asking, “Would the free world sacrifice one of its own countries by means of unrestricted nuclear warfare in order to gain ultimate victory?” The chiefs replied, “The atomic weapons which would be used against enemy forces would be selectively employed to assure minimum damage to the country and its population.”

The Build-up: The Japanese government successfully resisted U.S. efforts to deploy nuclear weapons on U.S. military bases in Japan. But a secret codicil of the 1960 security treaty allowed U.S. nuclear-armed naval vessels and aircraft to transit Japan. When the treaty was signed the US controlled of the island of Okinawa, which it captured during World War II. Not long after the 1957 exercise the United States began a nuclear build-up on Okinawa that peaked around 1,200 weapons in 1967. A 1968 non-public Japanese government study concluded the costs of Japan developing its own nuclear weapons were high and the security benefits negligible. Shortly afterward, Japan joined the NPT as a non-nuclear weapon state.

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The Japan Defense Agency conducted a second non-public study on whether Japan should develop its own nuclear weapons before agreeing to a permanent extension of the NPT in 1995. The study concluded that even in a worse-case scenario where both the U.S.–Japan alliance and the NPT collapsed, it was still “not favorable for Japan to take the nuclear option.” This suggests Japan is highly unlikely to develop its own nuclear weapons in the future.

Non-Nuclear Principles: One year later Japanese public opposition to U.S. control of Okinawa, and to the presence of U.S. military bases in Japan, forced the US to give it back. Because the 1960

security treaty forbid the deployment of U.S nuclear weapons in Japan, the nuclear weapons in Okinawa were removed before the island was returned in 1972. Prime Minister Eisaku Sato, who negotiated the Okinawa agreement, was awarded the Nobel Peace Prize for leading Japan into the NPT. He told the Nobel committee he established “three non-nuclear principles” that were reaffirmed by Japan’s national legislature. The principles state Japan will not manufacture, possess or bring nuclear weapons into Japan.

The three principles do not have the force of law. But Japanese officials—even those who secretly ignore them—repeatedly express fealty whenever questioned. The secret codicil that allows U.S. nuclear-armed ships and planes to transit Japan violates the third principle, which is probably why Japanese officials denied its existence until an opposition

government officially exposed it in 2010.

Prospects for the Future: The Japan Defense Agency conducted a second non-public study on whether Japan should develop its own nuclear weapons before agreeing to a permanent extension of the NPT in 1995. The study concluded that even in a worse-case scenario where both the U.S.–Japan alliance and the NPT collapsed, it was still “not favorable for Japan to take the nuclear option.” This suggests Japan is highly unlikely to develop its own nuclear weapons in the future.

Still, that small group of Japanese bureaucrats with close ties to the U.S. defense establishment

continues to work hard to maintain the role of U.S. nuclear weapons in Japanese security policy. They opposed President George H.W. Bush's 1991 decision to unilaterally remove all U.S. nuclear weapons from Asia. They told the U.S. Congress they support preparations to redeploy U.S. nuclear weapons in Okinawa. And they applauded the Trump administration's decision to bring U.S. nuclear weapons back into Asia.

These Japanese officials only speak in private and take exceptional measures to keep their comments secret. That's probably due to concerns about Japanese public opinion. A 2015 NHK poll showed that only 10.3 percent of respondents felt the nuclear umbrella was necessary, down from 20.8 percent in 2010. This tiny but powerful minority is also preventing the Japanese government from signing the Treaty on the Prohibition of Nuclear Weapons (TPNW). Japanese supporters of the treaty, led by the survivors of Hiroshima and Nagasaki, are pressing the Japanese government to sign. You can help by supporting their appeal.

Source: Gregory Kulacki, <https://allthingsnuclear.org/gkulacki/does-japan-have-nuclear-weapons>, 01 May 2020.

UK

Three British Nuclear Programs are \$1.67 Billion over Budget

Critical programs aimed at updating Britain's nuclear weapons infrastructure have been hit by long delays and huge cost increases, according to the parliamentary Public Accounts Committee. Poor management on three nuclear projects involving warhead assembly, core reactor production and submarine building have resulted in combined cost increases of £1.35 billion (U.S. \$1.67 billion) as well as delays of between 1.7 and 6.3 years, the committee revealed in a report scheduled for release May 12. The cost overruns were caused in large part by avoidable mistakes,

such as beginning construction work without mature designs, said the committee.

The cost increases and delays cited in the report could be the tip of the iceberg in the nuclear sector. The three programs investigated by the committee represent about a quarter, by initial value, of the 52 nuclear infrastructure programs that the Ministry of Defence is pursuing. A report on nuclear infrastructure late last year by the government's financial watchdog, the National Audit Office, said the initial value of all the projects was almost £5 billion.

The parliamentary committee said the MoD admitted that costs on the three projects "could keep rising, as its poor contract design has left the taxpayer to assume financial risk, while doing little to incentivize contractors to improve their performance."

The report said the MoD has poorly managed the three programs, failed to learn from past mistakes and agreed to poorly designed contracts with the major companies that have

a stranglehold on Britain's defense nuclear sector. The contracts did not allow the ministry to share the financial risk with contractors, which meant the government bore the full impact of cost increases, including those of subcontractors. ...

Source: Andrew Chuter, <https://www.defensenews.com/global/europe/2020/05/12/three-british-nuclear-programs-are-167-billion-over-budget/>, 13 May 2020.

USA–RUSSIA

Time to Restart Nuclear Arms Negotiations with Russia

The Associated Press reported on April 17 that Secretary of State Mike Pompeo and his Russian counterpart, Foreign Minister Sergey Lavrov, discussed nuclear arms control issues. Minister Lavrov reportedly expressed a desire to extend the New START Treaty, which expires next

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year. Separately, Deputy Foreign Minister Sergei Ryabkov added that Russia's new Sarmat heavy intercontinental ballistic missile and the Avangard hypersonic glide vehicle could be counted along with other Russian nuclear weapons under the treaty. The U.S. already considers these systems subject to New START limitations. Minister Lavrov was specific that Washington must agree to extend New START before Russia would agree to include new Russian systems in future negotiations. Secretary Pompeo reiterated the U.S. position that future arms control talks must embrace the White House desire to include China in a trilateral arms control agreement.

Frankly, holding New START hostage to Chinese agreement to join a trilateral negotiation makes no sense. Under New START, Russia and the U.S. are permitted to deploy up to 1,550 nuclear warheads. China maintains a minimum deterrence force that the director of the Defense Intelligence Agency recently stated to be a couple of hundred nuclear warheads. Given this large disparity, China has little to gain from negotiating and has shown little interest in doing so. If Russia and the U.S. can bring their numbers down significantly through a new round of negotiations, there could be a basis then to persuade China to join a trilateral negotiation.

The Trump administration should immediately accept the Russian offer to extend the New START Treaty and to engage in a new round of strategic arms negotiations. New START is the only U.S.-Russian nuclear treaty still in effect. If the pact is permitted to expire in February 2021, there will be no limits on Russian strategic systems and no inspection regime to verify what types and numbers of systems the Russians are deploying. The Joint Chiefs of Staff and the Intelligence

Community are solidly in favor of extending New START because they know what the adverse impact will be on our ability to assess the threat to U.S. interests and our planning to address that threat.

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A bold approach the U.S. should consider is to enter into a negotiation now with Russia to extend New START at a lower level of 1,000 deployed warheads from the currently authorized 1,550. During the 2010 negotiations on New START, the Joint Chiefs

certified that 1,000 would be adequate to support our deterrence strategy. Most of the rest of the New START text could remain the same, and the goal should be to extend the treaty at the lower level quickly and immediately enter into another negotiation to include new systems as the Russians suggest, possibly at even lower levels. The Office of the Secretary of Defense should be tasked to do an analysis to determine how low we could go under 1,000 deployed warheads.

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Some caution is warranted concerning the Russian proposal. We should be careful about agreeing to include hypersonic glide vehicles in follow-on negotiations. The U.S. needs a long-range, conventional missile using this technology and it is currently a high-priority

Department of Defense program. We need a conventionally armed, hypersonic missile in the range of 8,000 to 10,000 kilometers that can be launched from U.S.-controlled territory on short notice. Why? If we had hard intelligence today that North Korea is preparing nuclear armed missiles with sufficient range to reach U.S. territory for launch, the only systems we have that can strike that target promptly are nuclear. A conventional long-range, prompt-strike system provides a much-needed option.

Russia and China fear such a system because, if deployed in large numbers, it could provide a conventional first-strike capability against their nuclear systems. Currently, we do not plan to build a nuclear version and we could agree to limit the number of the conventional versions to be deployed. But the definition of hypersonic glide vehicle would have to be crafted carefully so an agreement doesn't capture our planned conventional version. A policy statement also should be included in the agreement text concerning our intent not to consider a conventional version subject to the treaty.

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Extending New START and entering into negotiations to reduce the numbers of deployed U.S. and Russian strategic systems are both in the U.S. national interest. The Trump administration should seize this opportunity to do so.

The S-400 ADS is designed to engage strategic aircraft and tactical aerial systems, ballistic missiles, hypersonic threats, and other air attack assets in an electronically contested environment, says the MoD. The Triumf engages aerodynamic and ballistic targets at distances of up to 400 km and up to 60 km, respectively.

Source: John Fairlamb, <https://thehill.com/opinion/international/494960-time-to-restart-nuclear-arms-negotiations-with-russia>, 03 May 2020.

BALLISTIC MISSILE DEFENCE

RUSSIA

Russian S-400 Air Defense Missile System Reaches Ballistic Target at 400 km

The Russian MoD reported the above-mentioned test on April 28. The report says an S-400 air defense missile system (ADS) of an Eastern Military District's (Vostochniy Voyennyi Okrug, VVO) employed the system to shoot down simulated ballistic missiles at the Telemba range (the Republic of Buryatia). "According to the scenario, a simulated enemy fired ballistic missiles to destroy the pieces of infrastructure at

a military compound. The crews of the S-400 systems locked on the targets at a distance of approximately 400 km, tracked them, and destroyed the threats," said the MoD, adding that the Favorit-RM and Armavir hypersonic jet targets had been used to imitate the attacking missiles.

The S-400 ADS is designed to engage strategic aircraft and tactical aerial systems, ballistic missiles, hypersonic threats, and other air attack assets in an electronically contested environment, says the MoD. The Triumf engages aerodynamic and ballistic targets at distances of up to 400 km and up to 60 km, respectively. The S-400's target engagement altitude lays between several meters and several dozen kilometers. It should be mentioned that the system allows its crew to engage ballistic targets flying at a speed of up to 4.8 km/s.

The above-mentioned interception is reported to be the first confirmed test of the S-400 against high-speed ballistic missiles. According to Russia's Rosoboronexport arms exporter (a subsidiary of state corporation Rostec), the export-oriented modification of the Triumf shoots down ballistic targets at a range between 5 km and 60 km, with target engagement altitudes laying between 2 km and 25 km. The full S-400 ADS simultaneously guides up to 160 surface-to-air missiles (SAMs) and engages up to 80 aerial targets.

Such a performance provides the Triumf with a positive market outlook. Compared to its closest competitor, the US-made Patriot PAC-3 ADS, the S-400 engages almost twice as many aerial targets (the PAC-3 keeps its eye at some 40 aerial vehicles) and has an advantage in terms of tracking (the PAC-3 tracks some 125 aerial

targets). At the same time, the Patriot is a strong peer-to-peer market player and should not be written off: it is an efficient system, which is capable of dealing with most aerial threats on the modern battlefield. Another competitor of the S-400 in the global market of long-range air defence assets is the HQ-9A system, which has been designed by the defense industry of the PRC. The HQ-9A is a modernized copy of an earlier variant of the S-300 (SA-10 Grumble) long-range SAM system and fails to compete with both S-400 and Patriot in terms of reliability and combat effectiveness. The PRC also markets its new LY-80 medium-range SAM system. However, this air defense weapon is reported to have a relatively bad performance when engaging cruise missiles: the LY-80 detects them at a distance of no more than 20 km. This disadvantage dramatically reduces its anti-missile capabilities: the LY-80 cannot be referred to as a 'missile killer'.

Source: https://www.armyrecognition.com/weapons_defence_industry_military_technology_uk/russian_s-400_air_defense_missile_system_reaches_ballistic_target_at_400_km.html, 01 May 2020.

NUCLEAR ENERGY

GENERAL

Worldwide Lockdowns to Reduce Nuclear Power Output by 3 Percent in 2020

Global nuclear power generation will decline by 3 per cent from 2019 levels in 2020 due to the lockdowns imposed in the wake of the Covid-19 spread, according to International Energy Agency (IEA). IEA said as part of its Global Energy Review 2020 report, "This decline would be the largest, not associated with a natural disaster and 40 per cent as large as the reduction in 2011

following the accident at Fukushima Daiichi." It added depressed electricity demand will continue throughout 2020, drawing less on nuclear power along with all other dispatchable sources of electricity. The Covid-19 lockdown measures have also slowed nuclear power construction activity and completion of several projects is likely to be pushed by a few months to 2021.

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The year 2020 is likely to see a modest number of new reactors completed, falling well below the recent high water mark of 11 GW completed in 2018. At the same time, a slower recovery than envisioned would lead to lower electricity demand

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and further reduce nuclear power output in 2020. When it comes to India, nuclear power plants of 7,000 MW capacity are currently under various phases of construction. India is planning to add around 20,000 Mw nuclear power generation capacity over the next decade. The overall electricity demand

has been significantly reduced as a result of lockdown measures being taken worldwide with knock-on effects on the power mix. According to IEA, electricity demand has been depressed by 20 per cent or more during periods of full lockdown in several countries across the world.

Source: <https://energy.economictimes.indiatimes.com/news/power/worldwide-lockdowns-to-reduce-nuclear-power-output-by-3-per-cent-in-2020/75493688>, 01 May 2020.

SOUTH AFRICA

South Africa to Develop Plan for New 2,500 MW Nuclear Plant

South Africa will soon start developing a plan for a new 2,500 MW nuclear power plant, the energy ministry told lawmakers on 07 May, 2020. Africa's most industrialised economy, which operates the continent's only nuclear power plant near Cape

Town, said last year that it was considering adding more nuclear capacity in the long term, after abandoning in 2018 a massive nuclear expansion championed by former president Jacob Zuma.

Analysts had expressed serious concern about Zuma's project for a fleet of nuclear plants totalling 9,600 MW because it would have put massive additional strain on public finances at a time of credit rating downgrades. Its current nuclear plant, Koeberg, has a capacity of around 1,900 MW and was synchronised to the grid in the 1980s. "The development of the roadmap for the 2,500 MW Nuclear New Build Programme will be commencing soon," the energy ministry said in a presentation to a parliamentary committee on its plans for 2020-25.

The presentation showed South Africa wanted to complete the procurement of the new nuclear plant by 2024 but gave no indication as to when it wanted construction of the plant to start or for when the plant would come online.

South African officials have talked about nuclear power as being part of an "energy mix" that also includes renewable sources like wind and solar as well as coal, on which it currently relies for more than 80% of its power generation. But financing those nuclear ambitions could be difficult at a time that the country's recession-hit economy is being hammered by the coronavirus pandemic, with this year's budget deficit expected to stretch into double digits. Answering questions, Energy Minister Gwede Mantashe said on 07 May, 2020 that the government would first "test the market" and hear what potential investors or consortia had to say about building the new nuclear facility. ...

Source: <https://energy.economictimes.indiatimes.com/news/power/south-africa-to-develop-plan-for-new-2500-mw-nuclear-plant/75615063>, 08 May 2020.

USA

DOE Announces \$27 Million for Advanced Nuclear Reactor Systems Operational Technology

The U.S. Department of Energy today (13 May) announced \$27 million in funding for 9 projects as part of the Advanced Research Projects Agency-Energy's (ARPA-E) Generating Electricity Managed by Intelligent Nuclear Assets (GEMINA) program. These projects will work to develop digital twin technology to reduce operations and maintenance (O&M) costs in the next generation of nuclear power plants by 10-times in order to make them more economical, flexible, and efficient. ...

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GEMINA teams will develop digital twins and associated technologies for advanced nuclear reactors to strategically design O&M frameworks for the next generation of nuclear power plants. These teams are designing tools to introduce greater flexibility in reactor systems, increase

autonomy in operations, and speed up design iteration, with a goal of reducing costs at advanced reactor power plants.

The projects will work to lower O&M costs by using diverse technologies that are driving efficiencies across other industries, such as artificial intelligence (AI), advanced control systems, predictive maintenance, and model-based fault detection. The teams will develop digital twin technologies for robust O&M strategies that can facilitate, among other things, more flexible operations for integration into an electrical grid with a large fraction of intermittent generation resources.

Nuclear energy is considered by many to be critical to achieving emissions reduction goals. Improving the cost-competitiveness of nuclear power generation through reductions in O&M

costs, particularly for the next generation of advanced reactors, is advantageous for maintaining and increasing this critical energy source. GEMINA is focused on novel digital technologies to achieve significant and sustainable reductions in O&M costs. These advances will lay the groundwork for a future where advanced reactors operate with a staffing plan and fixed O&M costs more competitive with those of other generation sources.

Source: <https://www.energy.gov/articles/doe-announces-27-million-advanced-nuclear-reactor-systems-operational-technology>, 13 May 2020.

UZBEKISTAN

Uzbekistan Plans Route to Cleaner Electricity Mix

Uzbekistan's Ministry of Energy has published a detailed 'Concept Note' outlining its strategy on electrical generation to the year 2030. The document anticipates a sharp reduction in the country's reliance on gas-fired power generation from the current 83% to 50%, and sets goals for new nuclear, solar and wind power production of 15%, 8% and 7%, respectively.

The Central Asian country became a member of the IAEA as long ago as 1994, has 50 years of experience in nuclear research and is one of the world's biggest producers of uranium. Despite its existing expertise in nuclear energy, Uzbekistan depends almost entirely on fossil fuels. About 86% of its electricity comes from burning gas, coal and oil, while the remainder comes from hydropower. It now has plans to build its first nuclear power plant, to help it keep pace with rising electricity demand and to cut its CO2 emissions.

According to the Concept Note, Uzbekistan's currently available generating capacity totals 12.9 GWe, which comprises 11 GWe of fossil fuel-powered generation (84.8%) and 1.85 GWe (14.3%) of hydro power. It has 11 fossil fuel

power plants and 42 hydro power plants. Between 2012 and 2019, its power generation rose by 2.6% each year on average, but this increase did not keep pace with demand and electricity shortages averaged 9.4% of consumption. Demand is expected to increase by about 6-7% each year up to 2030, when it is forecast to reach 120.8 terawatt hours, which is 1.9 times more than its level in 2018.

The strategy aims to achieve an installed generating capacity of 29.2 GWe after the decommissioning of obsolete assets (5.9 GWe). This includes: 13.4 GWe of natural gas-fired power capacity (45%); 5 GWe of solar PV (17.3%) - including 1 GWe with power storage systems; 3.8 GWe of hydro power capacity (13.1%); 3 GWe (10.4%) of wind power; 2.4 GWe of nuclear power (8.3%); and 1.7 GWe of coal-fired capacity (5.9%).

Uzbekistan and Russia signed an intergovernmental agreement on cooperation in the use of nuclear energy for peaceful purposes in December 2017, and in September 2018 a further agreement was signed for the construction by Russian state nuclear corporation Rosatom of two VVER-1200 reactors. These are to be commissioned in 2028 and 2030, respectively. In July last year, Alisher Sultanov, Uzbekistan's energy minister, announced the country wants to build four units and not just two as previously stated.

Source: <https://www.world-nuclear-news.org/Articles/Uzbekistan-plans-route-to-cleaner-electricity-mix>, 06 May 2020.

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NUCLEAR COOPERATION

RUSSIA-BANGLADESH

Rosatom Joins RPV Halves for Rooppur Unit 1

AEM Technology, part of the Atomenergomash engineering division of Russian state nuclear corporation Rosatom, has welded together the

upper and lower parts of the reactor pressure vessel (RPV) for unit 1 of the Rooppur nuclear power plant in Bangladesh.

The 10-day operation involved continuous heating of the seam to a temperature of 150-300 degrees Celsius. During that time, about two tonnes of flux and more than one-and-a-half tonnes of wire with a diameter of 4 mm were used. After welding, the 320-tonne RPV was transferred by crane to a furnace to be heat treated for two days. The equipment will then be subjected to x-ray, ultrasonic and capillary inspections. Two 1200 MWe (gross) VVER-1200 units are being built at Rooppur, which is on the eastern bank of the river Ganges at Rooppur, 160 km from Dhaka.

URANIUM PRODUCTION

CENTRAL ASIA

Uranium Mine Remediation Progresses in Central Asia

Efforts to overcome the legacy of uranium mining in Central Asia are making progress despite the global coronavirus pandemic, the European Bank for Reconstruction and Development (EBRD) announced. In Tajikistan, work on the preparation and eventual delivery of remediation can begin now that a framework agreement with the EBRD has entered into force. The document provides the legal basis for the implementation of projects in the country. A contract for remediation works in Shekaftar in the Kyrgyz Republic has also been signed. The Shekaftar mining complex includes three closed mines and eight mining-waste disposal areas that contain about 700,000 cubic metres of waste from mining operations. Radioactive waste-rock dumps, scattered around the village and next to a school, pose a risk to public health. The first remediation works at Shekaftar will focus on the closure of six shafts and the relocation of five waste-rock dumps to

an existing dump at a more remote location, EBRD said.

Central Asia was an important source of uranium for the former Soviet Union for over fifty years, which led to a large amount of radioactively-contaminated material being placed in mining waste dumps and tailing sites. Although most mines were closed by 1995, very little remediation was undertaken.

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The EBRD established the Environmental Remediation Account for Central Asia (ERA) in 2015 at the initiative of the European Commission, to assist the Kyrgyz Republic, Tajikistan and Uzbekistan in remediating some of the most dangerous sites left

by uranium production in these countries during the Soviet era. In November 2018, the European Union pledged an additional €10 million (\$11.3m) to the fund.

Source: <https://www.neimagazine.com/news/newsuranium-mine-remediation-progresses-in-central-asia-7906783>, 05 May 2020.

USA

Building a Uranium Reserve: The First Step in Preserving the U.S. Nuclear Fuel Cycle

The U.S. nuclear industry is coming off its best year ever. Electricity production from nuclear plants hit at an all-time high in 2019 as we led the world in generating more than 809 billion kilowatt-hours of electricity, which is enough to power more than 66 million homes. Yet, despite operating the largest fleet of reactors in the world at the highest level in the industry, our ability to produce domestic nuclear fuel is on the verge of a collapse.

Our uranium miners are eager for work, the nation's only uranium conversion plant is idle due to poor market conditions, and our inability to compete with foreign state-owned enterprises (most notably from China and Russia) is not only

threatening our energy security but weakening our ability to influence the peaceful uses of nuclear around the world. This is not an easy problem to fix, but the United States has a plan.

Restoring America's Competitive Nuclear Energy Advantage: The strategy for Restoring America's Competitive Nuclear Energy Advantage was recently released by the U.S. DOE to preserve and grow the entire U.S. nuclear enterprise. It's a direct result of the Nuclear Fuel Working Group, established by President Donald J. Trump, to address the challenges facing our nuclear fuel cycle.

The first immediate step in this plan calls for DOE to establish a uranium reserve. This new program will be managed by the Office of Nuclear Energy and is reflected in the Fiscal Year 2021 President's Budget. Under the Uranium Reserve program, NE would buy uranium directly from domestic mines and contract for uranium conversion services. The new stockpile is expected to support the operation of at least two U.S. uranium mines, reestablish active conversion capabilities, and ensure a backup supply of uranium for nuclear power operators in the event of a market disruption.

NE will initiate a competitive procurement process for establishing the Uranium Reserve program within the next year. Additional support will be considered over a 10-year period as market conditions evolve, including consideration of enrichment needs after first addressing the very near-term pressure on the uranium mining and conversion sub-sectors.

The Case for a Uranium Reserve: Uranium production in the United States has been on a steady decline since the early 1980s as U.S. nuclear power plant operators replaced domestic uranium production with less expensive imports.

State-owned foreign competitors, operating in different economic and regulatory environments, have also undercut prices, making it virtually impossible for U.S. producers to compete on a level-playing field. As a result, 90% of the uranium fuel used today in U.S. reactors is produced by foreign countries.

Our nuclear fuel production capabilities have also taken a severe hit. In 2019, the United States produced roughly 174,000 pounds of uranium, the lowest annual total in more than 70 years. A handful of U.S. uranium properties are now operating at minimal levels to keep their facilities in working order. Many more are not operating at all, waiting for market signals to begin production. The nation's only uranium conversion facility is also idle and ALL are at-risk of shutting down

permanently if markets don't improve.

Establishing the Uranium Reserve program is exactly what we need at this crucial time to de-risk our nuclear fuel supply. It will create jobs that support the U.S. economy and strengthen our domestic mining and conversion services.

The Long Road Ahead: As we work to restore the viability of the entire front-end of our nuclear fuel cycle, we realize this race is a marathon, not a sprint, and DOE is in it for the long haul. In addition to establishing the Uranium Reserve program, NE is all in on supporting other aspects of the president's strategy to reestablish our global

Uranium production in the United States has been on a steady decline since the early 1980s as U.S. nuclear power plant operators replaced domestic uranium production with less expensive imports. State-owned foreign competitors, operating in different economic and regulatory environments, have also undercut prices, making it virtually impossible for U.S. producers to compete on a level-playing field. As a result, 90% of the uranium fuel used today in U.S. reactors is produced by foreign countries.

The next 5-7 years will be a whirlwind of nuclear innovation as we see new fuels and reactors deployed across the United States. We're investing in the infrastructure and programs now to help usher in a new era for nuclear in the near-future.

leadership in nuclear energy.

The next 5-7 years will be a whirlwind of nuclear innovation as we see new fuels and reactors deployed across the United States. We're investing in the infrastructure and programs now to help usher in a new era for nuclear in the near-future. It's one that will ultimately lead to lower emissions, new jobs, and an even stronger economy. It's time to get to work.

Source: Office of Nuclear Energy, <https://www.energy.gov/ne/articles/building-uranium-reserve-first-step-preserving-us-nuclear-fuel-cycle>, 11 May 2020.

NUCLEAR NON-PROLIFERATION

RUSSIA

Russia's View on Nuclear Arms Control: An Interview with Amb. Anatoly Antonov

Arms Control Today conducted a written interview in early March with Anatoly Antonov, Russian ambassador to the US on issues including the current status of U.S.-Russian strategic security talks, the future of New START, talks on intermediate-range missile systems, engaging China in arms control, and President Putin's proposal for a summit of the leaders of the five permanent members of the UN Security Council.

Antonov was appointed ambassador to the US in August 2017. For more than three decades, he has served in the Soviet Ministry of Foreign Affairs and its successor, the Russian Ministry of Foreign Affairs, where he has specialized in the control of nuclear, chemical, and biological weapons. Serving as the ministry's director for security and disarmament, he headed Russia's delegation to the 2009 negotiations on the New START. He was

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appointed deputy minister of defense in 2011 and deputy minister of foreign affairs in 2016.

Arms Control Today: What issues were discussed in the recent U.S.-Russian strategic security talks in Vienna? When do the two

sides plan to meet next? Does Russia find this dialogue on issues affecting strategic stability useful and, if so, why?

Amb. Anatoly Antonov: Russia and the US are the largest nuclear weapons powers and permanent members of the UN Security Council. They bear a special responsibility for preserving world peace and security. That is why it is crucial to maintain the bilateral strategic stability dialogue at any given circumstance, regardless of political situation. It goes without saying that such engagement should be conducted on a regular basis.

While discussing security issues, one must keep in mind that any conversation, no matter how substantial it might be, should focus on achieving tangible results. Reaching agreements on reducing tensions and mutually acceptable arms control solutions could help meet this goal. The primary task is to rebuild confidence in this area, attempt to preserve treaties that are still in effect, [and] mitigate

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crisis dynamic. As for the consultations in January, our reaction can be described as "cautious optimism." On the bright side is the fact that the meeting did take place, even though it exposed serious disagreements between our countries on a number of topics. Without going into detail, I must note that on many occasions we heard our partners talking about a concept of conducting dialogue within the framework of the so-called great power competition. In our view, such a

formula could hardly serve as a foundation for building constructive cooperation on security issues between nuclear powers.

Nonetheless, Russian and American negotiators managed to discuss factors that significantly impact strategic stability (even though our partners somehow prefer the term “strategic security”). In our perspective, they include, above all, deployment of global missile defense, implementation of the “prompt strike” concept, threat of placement of weapons in outer space and designation of space as a “war-fighting domain,” quantitative and qualitative imbalances in conventional arms in Europe, development and deployment of low-yield nuclear warheads, and adoption of new doctrines that lead to lowering the threshold of using nuclear weapons.

In our view, another positive outcome of the renewed Russian-U.S. dialogue on strategic stability was the agreement reached in Vienna on conducting expert group discussions on specific topics, which we have to go over and agree on.

ACT: Do you agree or disagree with the idea that there is ample time to decide whether to extend the New START? From Moscow’s view, when must the presidents of the United States and Russia formally agree on extension of New START to ensure completion of the necessary processes before its expiration date? Is it Russia’s view that the treaty can only be extended once, or can it be extended multiple times totaling up to five years if the two parties decide to pursue that approach?

Is it possible for the Duma to provisionally recognize a joint decision by the two presidents to extend the treaty in order to allow a decision on extension closer to the expiration date?

Antonov: As you have correctly noted, Russian President Vladimir Putin clearly spelled out our stance on New START. On December 5, 2019, he declared our country’s readiness to immediately and unconditionally extend the treaty. Later last year, we officially suggested that Russia and the

United States should review the entire set of corresponding issues including the term of the treaty’s possible extension (up to five years).

However, we have yet to get a response. Trump administration representatives keep claiming that “there is still time” since the extension of the treaty in their view can be formalized in a matter of days. These statements are made despite our repeated clarifications that New START’s extension is not a “mere technicality,” but a rather extensive process that requires the Russian side to undertake a series of domestic legislative procedures. I would like to reiterate that as past similar review processes show, it may take several months to complete the New START extension. Therefore, it is surprising that the U.S. Department of State refused to conduct

it may take several months to complete the New START extension. Therefore, it is surprising that the U.S. Department of State refused to conduct consultations proposed by the Russian side on legal aspects of potential extension of the treaty.

consultations proposed by the Russian side on legal aspects of potential extension of the treaty. In response, we hear mixed comments (for instance, during the briefing of a “senior State Department official” on March 9, 2020) on the nature of interaction between the executive and legislative branches in Russia.

As for your last question, I would rather not contemplate in a conditional tense. I wish to emphasize: Russia stands ready to reach an agreement on New START’s extension even this very day. However, our goodwill is not enough. It requires U.S. consent, which we have not received yet. Should Washington agree, we will immediately begin implementation of the corresponding domestic procedures. We hope that the US will finalize its stance on New START in the nearest future since there is not much time left before the treaty expires in February 2021.

ACT: For nearly a year, the United States has insisted that China be involved in trilateral nuclear arms control negotiations with Russia and the United States. Chinese officials have said, however, that given the disparities between their arsenal and those of the United States and Russia, they are not interested in trilateral arms control talks at this time. Russia has said that if the U.S.

side can persuade China to participate, then other nuclear-armed states such as France and the United Kingdom should be involved.

In Russia's view, which nuclear arms issues and which types of weapons should be part of any bilateral or multilateral follow-on negotiation to New START? Would Russia be willing to engage in negotiations designed to limit or reduce stockpiles of nonstrategic nuclear weapons as well as strategic nuclear weapons? When, in Russia's view, should any such New START follow-on talks begin?

Antonov: I would like to remind you that our stance on this issue dates back to 2010. We have said more than once that, with the signing of New START, any possibilities for further reduction and limitation of strategic offensive arms on a bilateral basis are virtually exhausted and that further progress in this area will require involvement of other states with military nuclear capabilities. However, we do not understand why some of our U.S. colleagues talk exclusively about China. Let's also involve NATO members possessing nuclear weapons, Great Britain and France. In fact, that is what the special representative of the president for nuclear non-proliferation, Ambassador Jeffrey Eberhardt, suggested in his March interview with your journal, when he said, "we have to move beyond bilateral discussions between ourselves and Russia and bring in other countries."

We are convinced that cooperation with third countries in developing possible new agreements in this area should be strictly consensus based and pose no threats to legitimate security interests of the parties. Beijing has clearly rejected the idea of being involved in the so-called trilateral agreements on nuclear arms control that you have mentioned. We believe that this

"obsession" with the trilateral format can become a serious obstacle to the development of the Russian-U.S. strategic dialogue, in particular, in terms of preserving existing treaties and developing possible new bilateral agreements.

We do not understand why some of our U.S. colleagues talk exclusively about China. Let's also involve NATO members possessing nuclear weapons, Great Britain and France.

There is no doubt that the Russian-U.S. bilateral arms control agenda remains relevant. We are open to discussing within the strategic dialogue the issue of the newest and prospective weapons that

do not fall under New START. However, the conversation on this topic should be conducted in a comprehensive manner, which takes into account interests of both sides.

At the same time, the possible extension of New START would give Russia and the US an opportunity to discuss the prospects of bilateral and multilateral arms control regimes in the environment of strategic predictability.

ACT: Regarding your proposal to convene a heads-of-state meeting among the five permanent members of the UN Security Council, what specifically would be discussed at such a meeting, and what specific outcomes does President Putin think could be achieved and how?

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Antonov: Currently we have been conducting preliminary discussion on a possible date and venue for the summit. The goal of the

summit, as stated by Russian President Putin, is to begin a substantial conversation on the fundamental principles of cooperation on the international arena in order to resolve the most pressing issues faced by the global community. A meeting of the leaders of the five permanent members of the Security Council is the most appropriate format for such a dialogue to commence. We proceed from an understanding that the leaders will discuss the crisis situation in global stability and security, including the erosion of the UN-set foundations of the world

order, regional conflicts, fight against international terrorism and transnational organized crime, challenges of migration, and destabilizing technologies. We will not be able to leave out disarmament and arms control issues. We hope that the summit will allow us to identify approaches to solving pressing strategic stability issues.

But it can only be achieved within an interested and mutually respectful dialogue that implies consideration of interests of all sides. Later, other countries can and must join these efforts since only collectively we may solve the global problems of humanity. The summit is our proposal to the international community to step away from confrontational thinking and get behind a productive agenda.

ACT: Would Russia’s proposal for talks on a moratorium on deploying intermediate-range missiles also prohibit Russian deployment of the 9M729 ground-launched cruise missile, which U.S. and NATO officials have charged as an Intermediate-Range Nuclear Forces Treaty (INF Treaty)-noncompliant system? Which geographic “environments” does the Russian proposal envision becoming nondeployment zones for these prohibited missiles? How would the parties to the agreement monitor and verify compliance or otherwise share information about the locations and numbers of the prohibited systems? Lastly, is Russia open to considering counterproposals to its initial concept, and with which countries does Russia seek to negotiate such a missile moratorium?

Antonov: Russian President Putin’s message to the heads of the leading countries, including the United States and other NATO members, dated September 18, 2019, states that our country made a voluntary commitment not to deploy ground-based intermediate- and shorter-range missiles in Europe and other regions so long as the United States refrains from doing so. On many occasions, we have called on other countries to support this initiative in order to prevent a new missile arms

race, primarily on the European continent.

We believe that a multilateral moratorium in accordance with the Russian proposal will require additional verification measures, especially considering that launchers capable of firing intermediate-range land-based missiles are already deployed in Romania (Poland soon will follow suit). It was clearly proven during the test of a sea-based Tomahawk cruise missile fired from a ground-based Mk41 launcher conducted on August 18, 2019. Should our U.S. and European partners be interested, Russia is ready to work out corresponding technical aspects of the verification regime.

Russia stands ready to discuss the issues of intermediate- and shorter-range ground-based missiles with all concerned countries. Our call to adhere to a moratorium, similar to the one already observed by our country, is addressed above all to Washington and its allies in Europe and the Asia-Pacific region.

As for 9M729 missiles, the alleged “proof” amassed by the US and NATO of our systems violating the INF Treaty (while it was in effect) has never been presented either to us or the international community.

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ACT: Regarding the NPT, what are the main action steps on nuclear disarmament, previously agreed in the 2010 review conference outcome document, or perhaps new steps that Russia will encourage the 10th NPT review conference to support? What specific nuclear risk reduction measures is Russia ready to support in the context of the NPT review conference?

Antonov: Our stance and priorities in nuclear disarmament have been comprehensively described in the Russian working paper submitted to the second preparatory committee for the 10th NPT review conference. It stipulates a consensus-based incremental approach that implies consistent work on creating the right conditions that help the global community to continue down the path toward nuclear disarmament. In this regard, we consider the forced development of

the Treaty on the Prohibition of Nuclear Weapons (now open for signing) as wrongful. It fails to promote nuclear disarmament, undermines the NPT, and creates additional tensions between its participants. We believe that complete elimination of nuclear weapons is only possible within comprehensive and complete disarmament and under conditions of equal and indivisible security for all, including nuclear states, in accordance with the NPT.

A significant contribution to progress in nuclear disarmament would be made by extending New START and adopting a moratorium on the deployment of ground-based intermediate- and shorter-range missiles by the United States and its allies. An important role in efforts to limit and reduce nuclear weapons is played by the CTBT. Unfortunately, since the CTBT was opened for signature 20 years ago, the world has still been awaiting its entry into force. As for nuclear risks, we are working on a joint statement with the other permanent members of the UN Security Council on the inadmissibility of a nuclear war (the United States has failed to respond to Russia's proposal to do it in a bilateral format). This could in a way become a reconfirmation of the well-known Gorbachev-Reagan formula, this time in a multilateral format.

Source: <https://www.armscontrol.org/act/2020-04/interviews/russias-view-nuclear-arms-control-interview-ambassador-anatoly-antonov>, April 2020.

NUCLEAR SAFETY

GENERAL

New Safety Report on Occupational Radiation Protection in the Uranium Mining and Processing Industry

The mining of uranium has sustainably fuelled the fleet of nuclear power plants in the world and will continue to do so in the coming decades. How can the workers involved in the mining and processing of uranium be adequately protected from radiological risks caused by uranium exposure?

The annual World Day for Safety and Health at Work is celebrated on 28 April, and to commemorate it, we are presenting a recent IAEA

Safety Report providing hands-on guidance for regulators, operators, workers representatives, health, safety and environmental professionals on occupational radiation protection. The Report is the first of its kind in the IAEA safety standards series, focusing on workers who may be externally exposed to radiation emitted from ores, processed materials, uranium ore concentrate and tailings, and internally exposed from inhalation or ingestion of radioactive material, and contamination through injuries. The Report addresses suitable methods for control, monitoring and dose assessment for occupational exposure, and adequate radiation protection programmes. These must be designed and implemented for each of the three main methods of producing uranium — underground mining, open pit mining and in situ leaching (sometimes referred to as in situ recovery). The same approach shall be taken for each step of the life cycle of a uranium mining and processing: exploration, planning, construction and operation, decommissioning, handover and surveillance.

... "This Safety Report provides practical information on the type of radiological risks that workers could face in the exploration, mining and processing of uranium, on exposure assessment, and on management of exposure based on the application of the appropriate standards and good working practices." To create a common understanding in the industry, the guidance is suitable for newly embarking countries to this industry but also for those with a well-established uranium mining and processing industry.

One such country is Kazakhstan, responsible for more than a one third of the global uranium production. "Countries that are considering further development or renewal of uranium deposits can use this Report as a guide to assess radiological risks that occur at each stage of the production cycle," said Manas Iskakov, Director of Department of Occupational Health and Safety in Kazatomprom, a company extracting uranium in Kazakhstan.

The Report is based on the results of a questionnaire designed to provide a global overview of the occupational radiation protection in uranium mining and processing industry. The questionnaire, organized under the International

System on Uranium Mining Exposures (UMEX) project, identifies leading practices and actions to be implemented for optimization of radiation protection. Based on the answers from 36 operating facilities covering approximately 85 per cent of global uranium production in the questionnaire, it shows that the industry is committed to optimize protection of workers. Regulations are also in compliance with international standards on radiation protection.

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Source: Allison Westervelt, Lenka Dojcanova, <https://www.iaea.org/newscenter/news/world-day-of-safety-and-health-at-work-new-safety-report-on-occupational-radiation-protection-in-the-uranium-mining-and-processing-industry>, 28 April 2020.

JAPAN

Regulator Confirms Safety of Japanese Reprocessing Plant

Following the March 2011 accident at the Fukushima Daiichi nuclear power plant, new safety standards for nuclear fuel cycle facilities came into force in December 2013. The requirements vary from facility to facility, but generally include reinforcement measures against natural threats such as earthquakes and tsunamis, and in some cases tornadoes, volcanoes and forest fires. Reprocessing plants need to demonstrate these as well as countermeasures specifically for terrorist attacks, hydrogen explosions, fires resulting from solvent leaks and vaporisation of liquid waste.

The Rokkasho reprocessing plant meets these new safety standards. It set a one-month period to solicit feedback from industry minister Hiroshi Kajiyama and other parties concerned.

The NRA today approved a draft report saying that the Rokkasho reprocessing plant meets these new safety standards. It set a one-month period to solicit feedback from industry minister Hiroshi Kajiyama and other parties concerned. ...

At the Rokkasho plant, additional equipment and

systems are being installed for the recovery of radioactivity in the event of a severe accident. An evaluation is also being carried out of the impact on control devices and equipment in the event of a leak of high-pressure and high-temperature steam, and the development and installation of relevant countermeasures, if deemed necessary. A new emergency control room is also being constructed at the plant. Additional safety-related countermeasures are also being put in place,

such as internal flood protection, strengthening of the seismic resistance of pipework, improving cooling water tower resistance against tornadoes and improving measures against internal fires.

In a statement, JNFL said: "The acceptance of the draft examination is a big step forward for us today, and we will continue to make every effort to pass the examination." ... JNFL aims to complete the necessary safety countermeasures in the first half of fiscal 2021 (ending March 2022).

Source: <https://www.world-nuclear-news.org/Articles/Regulator-approves-safety-of-Japanese-reprocessing>, 13 May 2020.

LITHUANIA-BELARUS

Lithuania to Insist that Belarus Implements Safety Requirements before Launch of N-Plant

Lithuania will insist that Belarus implements all safety and security requirements before the launch of Astravyets Nuclear Power Plant, the country's President Gitanas Nauseda has said in an interview to BNS on 06 May, 2020. The Belarusian government reported earlier on 06 May that nuclear fuel for the first unit of the nuclear facility had already been delivered to the site. Nauseda expressed his belief that Belarus would resist the pressure from Rosatom, the Russian corporation implementing the nuclear facility project, to step up the pace of

project implementation at the expense of safety and security.

Lithuania's President reminded of his recent conversation with his Belarus' counterpart Alexander Lukashenko, whom he had urged to address the deficiencies identified during stress tests, and said that he had been assured that safety would not be compromised. The steps taken by Belarus in implementing safety requirements would be decisive for the nature of bilateral relations, Nauseda pointed out.

Lithuania had been aware in advance that nuclear fuel would be delivered to the nuclear facility in the first half of May and its delivery, "by no means, does not mean that this power plant will be launched immediately thereafter", Lithuania's president said. "Obviously, the safety of their people, their residents is important for them [Belarus' government] and they truly want to achieve those safety standards that have been defined. The thing is, however, that we probably perceive those safety standards in a different way sometimes," he noted.

Lithuania demanded that Belarus cooperated with the European Commission and the European Nuclear Safety Regulators Group (ENSREG) in order to ensure compliance with adequate safety standards, Nauseda said. "My message was very clear, that it is basically not the issue of bilateral negotiations or cooperation between Lithuania and Belarus. It is the issue of the European Commission and the experts of ENSREG, the European nuclear safety regulator. The problem goes far beyond the border issues of the two countries, which means that Belarus' cooperation with the EU and the global community is necessary," he added.

"Now it is important to make sure that Belarus' government does not succumb to that pressure put by Rosatom and the facility's builders. That pressure has been put for several recent years and its purpose is very clear – the builders want to speed up the launch of the facility whereas those who are building the power plant are certainly also interested in its safety," Nauseda said.

"My stance has been firm and it will never change: safety requirements and stress tests'

recommendations shall be implemented by – and I've emphasized that several times to president Lukashenko – the launch of the nuclear power plant and not at some point thereafter or in several years' time...."

Source: https://www.baltictimes.com/lithuania_to_insist_that_belarus_implements_safety_requirements_before_launch_of_n-plant/, 06 May 2020.

NUCLEAR WASTE MANAGEMENT

UKRAINE

IAEA Sees No Radiation-Related Risk from Fires in Chernobyl Exclusion Zone

The recent fires in the Exclusion Zone near the Chernobyl Nuclear Power Plant (NPP) in Ukraine have not led to any hazardous increase of radioactive particles in the air, the IAEA said on 23rd April, 2020. Basing its assessment on data provided by Ukraine, the IAEA said the increase in levels of radiation measured in the country was very small and posed no risk to human health. "In addition, these radiation levels fall significantly with increasing distance from the site of the fires," said Elena Buglova, Head of the IAEA's Incident and Emergency Centre (IEC), which has been in close contact with Ukrainian authorities since the fires began in early April.

The State Nuclear Regulatory Inspectorate of Ukraine (SNRIU) has regularly provided information on this month's fires through the IAEA's Unified System for Information Exchange in Incidents and Emergencies (USIE), the 24/7 secure website for Member States to exchange information. For its part, the IAEA's IEC communicated via USIE with contact points in other Member States and international organizations and answered their questions. On 8 April, SNRIU reported via USIE that nuclear and radioactive waste management facilities in the Exclusion Zone were safe and there was no need to evacuate plant workers or take other protective measures for staff there. The Ukrainian authorities have a network of radiation monitoring stations country-wide and around the Chernobyl NPP, whose last operating reactor was shut down two decades ago. The SNRIU on April 14, 17, 20 and 22 provided updated information on USIE on measurements of radiation levels in the air.

The burning of meadows, pastures and stubble has resulted in some minor increases in radiation due to the release of radionuclides transferred from soil contaminated in the 1986 accident. But the concentration of radioactive materials in the air remained below Ukraine's radiation safety norms and posed no public health concern, the SNRIU said. Ukraine has informed the IAEA that environment monitoring laboratories at the country's operating NPPs, the Ukrainian Hydrometeorological Centre, the Ukrainian Hydrometeorological Institute, the Chernobyl NPP and the SSE "Ecocentre" in the Exclusion Zone continue to monitor the level of radiation in the air in close communication and coordination with SNRIU.

The IAEA's IEC communicated via USIE with contact points in other Member States and international organizations and answered their questions. On 8 April, SNRIU reported via USIE that nuclear and radioactive waste management facilities in the Exclusion Zone were safe and there was no need to evacuate plant workers or take other protective measures for staff there.

Since 1986, radiation levels in the environment have fallen significantly, due to natural processes and counter measures. Most of the land contaminated with radionuclides has been made safe and returned to economic activity. The IAEA provided extensive assistance to the regions affected by the disaster, including in the remediation of affected cities and farmland, monitoring of human exposure to radiation, and dissemination of information. The IAEA has continued to help with decommissioning of the reactors and radioactive waste management at the site.

Source: <https://www.iaea.org/newscenter/pressreleases/iaea-sees-no-radiation-related-risk-from-fires-in-chornobyl-exclusion-zone>, 24 April 2020.



Centre for Air Power Studies

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