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OPINION – Manpreet Sethi

COVID-19 Holds Up Mirror to Nuclear Risks

It does not seem like the right time to talk about nuclear risks and their mitigation. Attention across countries is focused on grappling with COVID-19, which has changed our perspective on life and social relations. The virus has been a great leveler – all are experiencing an equal sense of vulnerability as the pandemic spreads uninhibited.

But, as we confront this challenge, this is, perhaps, the right time to understand the gravity of a humanitarian disaster that nations would face in circumstances in which nuclear weapons might be involved. Such a situation is not unthinkable given that nuclear risks have been steadily growing over the last few years and major nuclear powers appear loathe to even discuss, let alone address them.

As it stands, no nuclear weapon possessor is ready to give up its nuclear weapons. Rather, the role of the weapons seems to be expanding beyond the sole purpose of nuclear deterrence. Countries like North Korea and Pakistan have even shown the multi-utility of these weapons as “strategic equalizers” to superior conventional forces or bargaining chips for economic aid.

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weapons to include deterrence of large scale conventional, cyber or space threats. Such examples add value to the nuclear weapons and reduce the chances of making non-proliferation sustainable.

Besides a growing reliance on nuclear weapons, other evident contemporary trends include the modernization of nuclear capabilities; a fast crumbling nuclear arms control architecture; and the unrestrained emergence of new technologies that could

impact nuclear use.

The last issue is serious. The advancing capabilities of cyberattacks on nuclear command

and control, the blurring of lines between conventional and nuclear delivery, the introduction of hypersonic missiles capable of high speed and maneuverability, and the incorporation of artificial intelligence and machine learning in nuclear decision-making will impact nuclear deterrence in ways that are not adequately understood yet.

The supposed purpose of these capabilities is to enhance nuclear deterrence by complicating the adversary's decision to use nuclear weapons by signaling the assuredness of a response. The downside of these technologies, however, is that they could heighten misperceptions and miscalculations besides triggering an offense-defense spiral.

Ideally, every nuclear dyad must seek strategic stability to minimize such risks. This may be sought through the development of similar or superior deterrent capability or by concluding mutual restraint. Unfortunately, nuclear states today seem inclined towards the first kind of response. There does not appear to be a common understanding of the risks being generated, nor a willingness to control technological advances that may create new security dilemmas.

A further challenge is posed by the problem that several of these dyads elongate into nuclear chains such as US-Russia-China; US-China-North Korea; US-China-India-Pakistan. Obviously, changes in nuclear capabilities, doctrines or postures in any one actor/dyad impacts others.

Any inadvertent use of nuclear weapons in any of the dyads or chains would have severe global consequences. Of course, the severity of the damage would depend on the number and yield of weapons used. But, studies indicate that the

use of even a fraction of the arsenal held by two medium-sized countries would have repercussions beyond the immediate region of nuclear exchange for food and water availability, agricultural output, climate change, migration, etc.

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Like the current pandemic, nuclear use too will a leveler. Therefore, for the sake of international security and global stability, measures that reduce chances of inadvertent nuclear use are urgent and imperative.

Acceptance of NFU by all nuclear armed states could be one significant step in this direction. If every country was to commit not to be the first to use the weapon, there would be no nuclear use. Such commitments would be especially helpful during times of crisis. This has been the experience, for instance, of India and China. Even during military hostilities between the two, a sense

of nuclear stability has prevailed.

Universal acceptance of NFU would lead to a drop in the stock value of nuclear weapons. It would, gradually, become meaningless to retain or acquire weapons of diminishing utility. This

would encourage horizontal and vertical non-proliferation. And, also create conditions for their eventual elimination.

The fight with the novel coronavirus has shown up the dismal state of public healthcare in most countries. Meanwhile, liberal spending on military preparedness continues. Is it not time to reorder national spending priorities to cater for human security as part of national security?

A useful start could be made by collectively addressing nuclear risks and eschewing foolish arms races, particularly of the nuclear kind. A global NFU could be a good confidence building

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measure to alter the cycle of negatives that currently pervades international relations.

COVID-19 has held up the mirror in which nuclear risks are starkly reflected. Let's not miss the chance to see them for what they are. The cost their use might extract – in human lives, socioeconomic upheaval, and environmental dimensions – might be unaffordable.

Source: <http://www.koreatimes.co.kr>, 01 April 2020.

OPINION – Sergio Duarte

An Unexpected Chance for the Success of Postponed NPT Review Conference

It took patience from the President-designate of the 2020 NPT Review Conference, a sober assessment of the situation by a number of states, particularly from the NAM and help from the UN Office for Disarmament Affairs (UNODA). In the end, the parties to the Treaty agreed to postpone the Conference to next year, “as soon as circumstances permit, but no later than April 2021”.

The postponement was inevitable in view of the rapid spread of the new coronavirus. The decision leaves the door open for further consultations on procedural matters, particularly regarding the date and venue of the Conference. Some parties might have preferred to hold the Review Conference earlier, rather than later, and views on the most adequate venue were divergent, but common sense prevailed. The agreement provides a few month's respite during which countries may ponder on how best to approach the Review Conference with a view to avoiding unnecessary confrontation.

As the world tries to mitigate the disastrous effects of COVID-19, one cannot avoid reflecting on still greater calamities, including nuclear war, the greater danger that the NPT seeks to avert. The effects of the use of nuclear weapons are well known and need not be overemphasized: they will

not be limited by national boundaries; existing resources will not be sufficient to deal with the ensuing humanitarian consequences; the gravity and scale of the human toll, coupled with irreversible environmental damage may herald the end of conditions of survivability on the planet.

The widespread suffering caused by the current pandemic should therefore be a clarion call for greater understanding and cooperation among nations to deal with risks and problems that affect everyone and consequently require common solutions. Assuring that the Review Conference will strengthen the Treaty's effectiveness and its vital contribution to peace and security has now acquired renewed timeliness and urgency.

On the substantive side there are a number of issues that need to be discussed constructively over the next months in order to facilitate a much-desired successful outcome in 2021. The last

Review Conference ended without consensus on a Final Document, as was the case in four previous occasions.

Some features of the current panorama regarding nuclear disarmament and non-proliferation suggest the

recrudescence of an atmosphere reminiscent of the one that prevailed during preparations for the 2005 Conference. At the III Session of the Preparatory Committee in 2004, sharp disagreement fueled by deep mistrust and outright hostility among delegations prevented it from arriving at requisite procedural decisions.

The Conference itself was thus unable to even start meaningful substantive work until it was too late to expect any substantive result. The failure served to rally political will from several quarters and to a large extent paved the way to the successful adoption of an ambitious Plan of Action in 2010.

In the years that followed, general concern about the recognition of the “catastrophic consequences” of nuclear detonations was decisive for the

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convening of three international meetings of governments and experts. Their conclusions provided the necessary impetus for the subsequent negotiation and adoption of the Treaty on the Prohibition of Nuclear Weapons (TPNW), whose relationship with and relevant contribution to the objectives of the NPT must still be better understood across political divides.

Pressing substantive issues also demands urgent consideration in preparation for the forthcoming Review Conference. Agreement on the important question of the Middle East Conference on weapons of mass destruction eluded the NPT 2015 Review. Middle Eastern states met in New York in November 2019 in an effort to keep the issue at the forefront of international concerns, despite the deterioration of the situation in the region and the indifference of key players.

Special attention must be given to how the 2021 Review Conference should approach this sensitive – yet crucial – subject. The consequences of lack of progress on this question since the 1995 Review and Extension Conference continue to haunt delegations and to undermine credibility in the Treaty.

In the last five years the international climate did not improve; on the contrary, the world became more unpredictable and unstable, as well as marked by a perilous trend towards self-centered attitudes and policies. Resumption of high-level talks among the major nuclear weapon States – particularly those possessing the largest arsenals – is essential to restoring the degree of confidence necessary for a successful outcome in 2021.

Early agreement on the extension of the New START beyond its expiration in February next year – that is, before the Review Conference – would

be a welcome signal of the will of the two largest possessors of nuclear weapons to further reduce existing arsenals.

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Such new reductions should not be considered as an end in themselves. Rather, they should be conceived and undertaken in explicit consonance with the commitment expressed in Article VI of the Treaty. By the same token, other nuclear weapon states should reinforce measures

of restraint, avoid regional confrontation and work collaboratively to support and advance the goal of achieving their complete elimination.

Constructive proposals to reduce the risk of a nuclear war being started by accident or miscalculation have been made from different quarters. For instance, the five nuclear weapon

parties of the NPT should jointly support the reaffirmation by the 2021 Review Conference of the Reagan-Gorbachev level-headed statement that “a nuclear war cannot be won and must never be fought”.

Related measures that have been on the table for some time deal with a no-first-use commitment or an agreed decrease in the operational readiness of

nuclear forces. These, among other equally reasonable and responsible proposals, deserve serious examination.

The sharp differences between states and groups within the NPT can only be reconciled by means of a general recognition of the common interest in the preservation of the Treaty so that it can continue to play a major part in preventing new countries from acquiring nuclear weapons and in promoting their elimination, besides fostering peaceful uses of nuclear energy.

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accomplished" in view of the success in curbing horizontal proliferation must not be allowed to overshadow the imperative for similar achievements in the development of peaceful uses and especially in attaining effective, legally binding nuclear disarmament measures.

The history of past Review Conferences shows recurrent dissatisfaction with the performance of the Treaty among many of its parties. An exacerbation of this pattern could lead to any or some of them to exercise the right ensured by article X.1 and leave the Treaty. This would create a major crisis and must be prevented. The answer, however, is not simply trying to buttress the conditions for withdrawal stipulated in the Treaty but rather to increase the confidence that it will more faithfully deliver on all its articles, without exception, thereby better attending to the interests of all its parties.

In the mid-1960's the shared interest of the original promoters of the NPT – the Soviet Union and the United States – to limit the number of states acquiring nuclear weapons prompted the two superpowers of the time to lay aside their mistrust and hostility and join forces in order to steer the transit of their joint draft treaty through the Eighteen-Nation Disarmament Committee and the United Nations General Assembly.

The hesitation of a significant number of states to immediately subscribe to the Treaty gave way to a gradual recognition that it was indeed in their own interest not to develop such weapons. In adhering to the Treaty, such States accepted this as a legally-binding obligation, provided the other end of the bargain – nuclear disarmament – would also be complied with. The longer this objective is sidestepped and delayed, the greater discredit will the Treaty face.

Next May fifty years will have passed since the NPT entered into force. It has since become the most adhered-to instrument in the field of arms control and is rightfully considered the

cornerstone of the non-proliferation regime. Up to the present, however, it has not produced the expected results with regard to the elimination of the threat posed by the existence of nuclear weapons. In spite of their commitment under Article VI the nuclear-weapon states have consistently increased the power of their arsenals and added new and ever more sophisticated instruments of destruction. They have stated their resolve to retain such arsenals for as long as they see fit and to use them in the circumstances they consider adequate.

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No wonder that non-nuclear parties of the NPT show growing signs of exasperation with the neglect of NPT nuclear disarmament obligations. Such frustration led to the successful negotiation and adoption of the Treaty on the Prohibition of Nuclear

weapons leading to their elimination, adopted by the United Nations in 2017. This new instrument clearly states the conviction of a majority of members of the United Nations that the humanitarian, social and environmental consequences of any use of nuclear weapons are not acceptable under international law and are contrary to the civilized standards of behavior among nations.

In his book *Multilateral Diplomacy and the NPT: An Insider's Account*, Ambassador Jayantha Dhanapala, former President of the landmark 1995 NPT Review and Extension Conference, observed: "Ultimately, the best guarantee against complacency is to be found in the level of confidence among the states parties in the basic legitimacy or fairness of the treaty. [...] There is a persisting, widespread perception amongst many states parties that the fundamental NPT bargain is in fact discriminatory after all, as many of its critics have long maintained. So how can the states parties best prevent their hard-fought bargain from deteriorating into a swindle?"

This is the urgent task that confronts all parties to the NPT.

Source: The writer is Former UN High Representative for Disarmament Affairs and current President of Pugwash. IDN-InDepthNews, 12 April 2020.

OPINION – Jean-Philippe Vuillez

Can India Catch Up on Nuclear Medicine?

Amidst the coronavirus pandemic, nuclear medicine is having its time to shine. The IAEA is providing diagnostic kits and training to countries interested in using nuclear-assisted tests to detect the virus and track its transmission paths.

It's not surprising that nuclear medicine is set to play a key role in the fight against the novel coronavirus. Nuclear medicine, which relies on the use of radioactive drugs or radiopharmaceuticals (RPs) for either diagnostic or therapeutic purpose, has rapidly become a crucial medical field and a shining example of the peaceful application of atomic energy.

A typical nuclear medicine examination consists of injecting a radiolabeled molecule as a biomarker that allows the tracking and detection of specific disease processes, and their evolution over time. Doing so is crucial for diagnosing and treating a variety of diseases, including cancer, heart, lung and kidney conditions as well as infectious diseases – especially important in the current Covid-19 pandemic.

The widespread use of RPs in nuclear medicine makes it clear that their reliable supply is crucial to upholding high medical standards across the globe. While a group of around 20 RPs, such as technetium-99m (Tc-99m), the most widely used medical isotope, have become indispensable, research is ongoing on

others which may prove to be highly innovative and a big evolutionary step in modern personalized medicine.

Behind the Curve: Developed countries have easy access to radioisotopes and equipment; as a result, many aspects of nuclear medical applications are standard in these parts of the world. However, the story is often different in emerging markets, where advancements in nuclear medicine are currently difficult to apply.

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Take India, for example. Despite spectacular economic and technological expansion in recent years, nuclear medicine in the country is still not anywhere near as developed or prioritized as in Europe. At the same time, available nuclear medicine varies greatly across the country, as centers of excellence are interspersed with regions of exceptionally low socio-economic development. It's not surprising that India has a lot to catch up in that regard.

But just how big is the challenge really? In 2018, the country's radio-medicine infrastructure consisted of 293 departments of nuclear medicine, 233 gamma cameras, 70 of which are coupled with CT, 222 PET-CT, 3 PET-MRI and 19 cyclotrons, for a population of 1.3 billion. To put this into perspective, that same year France counted 215 nuclear medicine departments, 458 gamma cameras, 118 of which were CT and 49 solid-state, 160 PET-CT and 3 PET-MRI, for a population of 66 million.

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Assuming that routine public health problems are similar in India and France, authorities would need to provide at least 9000 SPECT and 3150 PET-CT cameras to reach the same standard relative to the population as France. Considering that France's equipment is

nothing exceptional, being at best average for Europe and noticeably less sophisticated than Germany or Belgium's equipment, the gap that India needs to fill is gigantic.

A Nuclear Medicine Industry for India? However, with the challenge India faces comes a colossal opportunity for the development of nuclear medicine, if only to be able to perform the most essential examinations on a large scale. A lot more equipment is needed, but the particular importance of RPs can't be overemphasized: without them no far-reaching examinations are possible in the first place, so the radionuclides required to produce RPs need to be available in sufficient amounts.

First priority, then, should be given to acquiring Mo-99/Tc-99m generators as well as cyclotrons to produce positron-emitting fluorine. This also creates a positive knock-on effect on employment, given that enough imaging technicians and nuclear doctors need to be trained to carry out the examinations and interpret them, along with radio-pharmacists to manufacture RPs. The challenge is significant, from a human and logistical perspective as well as a financial point of view. While these techniques seem expensive at first glance, however, they eventually generate considerable savings thanks to the optimization of the care they allow, resulting in a very favorable cost-benefit ratio in many medical and economic analyses.

From a policy point of view, New Delhi has two main options to achieve rapid progress. Policymakers need to ascertain whether an indigenous industry for the medical sector,

working for example under technical licenses from established global companies with know-how in the field, can be created; or if a targeted import policy could show results quicker and at lower costs.

The latter provides particular advantages while national industrial laboratories for the production of radionuclides are being established. A laundry list of high-tech equipment – ranging from the production of Tc-99m generators from molybdenum to the production of this same molybdenum by irradiation in nuclear reactors, as well as gamma cameras – could be sourced from a number of external suppliers with experience in the field, such

as Russia's Rosatom or Germany's Siemens, among others. Similarly, the production of cyclotrons in India remains currently unviable and a significant hurdle, which should be overcome as soon as possible.

All of this means that for the time being, short of being able to produce them domestically, India needs to import precursors and RT-nuclides along with the technology needed for their production. But ultimately, India has little choice but to produce

radiopharmaceuticals indigenously: as the Nuclear Energy Agency notes, "supply of Mo-99/Tc-99m to health care providers has often been unreliable over the past decade due to unexpected shutdowns and extended maintenance

periods at some of the facilities that produce Mo-99, many of which are relatively old."

Add to this the short half-lives of these isotopes (several hours), and it becomes clear that a country of India's size cannot make itself exclusively depend on other countries for these vital resources and needs to have indigenous production sources to ensure security of supply.

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A Global Opportunity: Looking a few years ahead, India could well become a global leader in the field of nuclear medicine if the policies to develop this sector are rigorously pursued. The logistical, economic and human effort required will undoubtedly lead to a surge of investments in research in a country that already has world-class scientists conducting cutting-edge studies.

India will reap a lot of benefits from this, but the ultimate winner will be the global public. After all, nuclear medicine represents a relatively small scope of examinations, is expensive to develop, and cannot continue to evolve significantly unless it is applied on a global scale. This is an area in which globalization shows its greatest promise.

Source: Jean-Phillipe Vuillez, Sustainability Times, <http://www.sustainability-times.com>, 01 April 2020.

OPINION – Kyle Mizokami

Pakistan's Tactical Nuclear Weapons a Bigger Threat to Pakistan itself than India

Pakistan is one of the few countries and the only Islamic nation in the world to possess nuclear weapons. Pakistan's nuclear weapons are designed to offset India's huge superiority in conventional forces and deter the adversaries.

Pakistan began developing nuclear weapons after its arch-rival India detonated its first nuclear bomb in 1974. A conservative estimate puts Pakistan's nuclear arsenal around 150 to 180 bombs. In 1998 Pakistan in response to India's second nuclear test detonated five devices in a single day and a sixth one two days later.

To tackle growing Indian threats of punitive cross border strikes, Pakistan focused on developing tactical nuclear weapons. Tactical nuclear weapons or non-strategic nuclear weapons that have a low yield. These weapons unlike large nuclear weapons that are used for destroying

large strategic or civilian targets in the enemy's territory are used for destroying military targets on the battlefield.

Pakistan's economy is tiny when compared against India and as such it does not have a defense budget to counter India's vastly superior armed forces with the gulf widening every day. In an all-out ground war, India undoubtedly holds the edge.

India had envisioned launching a counterattack with three Strike Corps of three divisions, all highly mechanised and each including at least one armoured division in case of a Pakistani offensive. However, Pakistani TNWs are meant to thwart India's counterattack in case of a failed Pakistani offensive to halt the advancing Indian troops dead in their tracks.

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The idea for having tactical nuclear weapons most probably had its origins in the 1999 Kargil War. After Pakistani forces occupied much of the Indian Territory, the Indian Army mounted an offensive to remove the Pakistani force and regain the lost ground.

Although India was at a disadvantageous position it still managed to win the war and this loss made Pakistan aware of India's conventional superiority and the need to have tactical nuclear weapons. Another reason Pakistan wanted to have tactical nuclear weapons was to thwart India's cold start doctrine, as widely publicised by Indian National Security Advisor – Ajit Doval

It became clear that according to a report by Bulletin of Atomic Scientist Pakistan has around 20 -30 transporter-erector-launcher vehicles meant to carry its NASR/HATF short-range tactical nuclear ballistic missiles. Each vehicle can carry two or more NASR missiles.

These missiles are believed to have a range of 43 miles meaning they are more likely to be used for defensive rather than offensive purposes. This also indicates that the nuclear weapons would have a low yield as Pakistan would not want to have its

own nuclear weapons with a huge yield detonated on its territory.

However, these weapons should worry Pakistanis more than anyone else. Even if Pakistan calls it tiny weapons to offset India's conventional military might, these are nonetheless nuclear weapons and if used against India will not only invite an unimaginable response from New Delhi but also global condemnation and sanctions from across the world.

Analysts believe that Pakistan would have to use a minimum of 30 kiloton bomb to seriously hurt Indian troops. The wind direction is crucial at the time of detonation. The radioactive particles from a detonation can spread to thousands of miles. Any such detonation on the Pakistani soil and near to a city can kill millions of Pakistanis.

Additionally, a big problem that has struck the Pakistani political and military establishment is regarding the control of such weapons. A political decision may take too much time rendering the use of tactical nuclear weapons futile.

However, the Pakistan Army to avoid such delay has tasked area commanders with the responsibility of using the tactical warheads which has presented another serious question. If an area commander uses these weapons then there may be no turning back as India then would be forced counter-nuke Pakistan. This has exacerbated the command and control challenges.

One of the biggest threats to these Pakistani weapons is from the home and foreign-based insurgents. India and other global powers are especially worried about the nature of security accorded to such tactical weapons and their control

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To prepare for nuclear weapons to be used is too late. The only option is prevention. Modelers have shown that even a limited nuclear exchange would have the most devastating consequences for the planet. Yet much remains to be done to increase public understanding of nuclear risks.

Some officials are worried that these weapons may be snatched while they are being transported. Another worry is that the terror groups may be able to plant one of their own sympathisers or they may turn an insider to sympathise with the terrorist cause who in turn may hand them secrets of

nuclear technology.

Considering that such weapons present multiple problems from their effective control to protection and to its possible use on Pakistani soil itself and that too without any conclusive evidence of it being a deterrent, the tactical nuclear weapons are more a nightmare than a strategic deterrent.

Source: <http://www.defencenews.in>, 12 April 2020.

OPINION – Lassina Zerbo

Nuclear Weapons Leave No Curve to Flatten

The coronavirus pandemic seemed to come from nowhere, and the battle to beat it is currently crowding out thoughts of another terrifying threat whose "surprise" would cause significantly greater devastation. The tragedy of COVID-19 must take immediate priority, and it has thrown a stark light on the need for preparedness. The threat of nuclear weapons cannot await a similar crisis.

To prepare for nuclear weapons to be used is too late. The only option is prevention. Modelers have shown that even a limited nuclear exchange would have the most devastating consequences for the planet. Yet much remains to be done to increase public understanding of nuclear risks, and to bolster political will around the world to address those risks with sufficient urgency.

There is some good news, however. Although scientists are having to scramble to find a drug or vaccine against this new virus, others have already been engaged for decades in developing and deploying measures to address the man-made dangers of nuclear weapons.

Ever since the test of the first atomic bomb 75 years ago turned the night sky to day over New Mexico in the US, a parallel path has been forged to try to curb the dangers of nuclear weapons, and science has been at the forefront of this effort.

March 2020 marked the 50th anniversary of the Nuclear Non-Proliferation Treaty, which enjoys the support of 191 countries. The NPT is regarded as having made the difference between unrestrained nuclear proliferation and keeping the number of states possessing nuclear weapons to the current single-digit total.

In the face of COVID-19, the NPT's scheduled April 2020 review meeting in New York has been postponed. When it does go ahead it will likely be held in a sober atmosphere of concern at the erosion of arms control agreements, huge investment in the modernization of nuclear weapons, and a dangerous crossroads where advanced technologies and nuclear risks meet.

Preventing the development of nuclear weapons is the best defense against their existential threat. Without testing them, a country is unable to determine if they work and move to deployment. This is the purpose of the CTBT, which bans all nuclear test explosions, everywhere. With 184 member states, it is one of the most widely supported arms control treaties in the world — a major achievement on the path from the first explosion in 1945 to the eventual goal of nuclear disarmament.

Crucially, the ban is backed by a strong verification regime including a high-tech monitoring network that runs around the globe and beneath the oceans, constantly taking the pulse of the planet for any evidence of a nuclear explosion. In December last year this network, which has already proved its worth by detecting all six of North Korea's nuclear tests, reached the milestone of 300 operational monitoring facilities — well on the way to the ultimate total of 337.

Yet the CTBT remains in legal limbo. Without being ratified by China, Egypt, India, Iran, Israel, Pakistan, North Korea and the US it cannot enter into force as binding international law. Just as COVID-19 knows no borders, the effects of nuclear weapons would not respect national boundaries. Both the nuclear non-proliferation and nuclear test ban treaties are major international achievements that could not have been won without a collective global approach: the multilateralism of diplomacy and scientific cooperation.

Current challenges cannot be met without reinforcing this approach. There is an urgent need for states to broaden their increasingly narrow perspective and acknowledge that the world is multidimensional. New tools are needed for diplomatic relations, along with the resources to support them. We must urgently strengthen the ties between diplomacy and science. While finding common political ground can be difficult, the neutral language of science can support sound decision-making while also helping to build trust and understanding — just as it is doing with COVID-19.

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Nature's capacity is limitless and the future may bring other lethal pandemics. COVID-19 has brutally revealed the consequences of inadequate preparation, but the battle to reduce its impact is being fought. Nuclear weapons offer no such possibilities: they demand not mitigation but prevention. There will be no curve to flatten.

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Source: Lassina Zerbo is Executive Secretary of the Comprehensive Nuclear-Test-Ban Treaty Organization, <http://www.kyodonews.net>, 12 April 2020.

OPINION – Power Technology

Nuclear Industry’s Response to Covid-19 Outbreak

The Covid-19 crisis has led to a slowdown of the economic growth of countries across the world. The global pandemic has called for considerable measures to be taken in every aspect of life worldwide. The coronavirus spread has affected numerous industries and the global economy. One such industry is the power sector, which has witnessed a visible impact in the last two months. The electricity demand curve has taken a new shape in the affected regions.

During this ongoing Covid-19 crisis, apart from fossil fuel and renewable power technologies, nuclear reactors are also playing a crucial role in a number of countries in maintaining electricity supplies. Nuclear technology is a major baseload power-generating source and accounted for 10.3% of global power generation in 2019. The nuclear power sector is growing in many countries as demand for electricity increases. Some 31 countries are currently operating nuclear reactors for their electricity generation.

Countries with significant nuclear power capacity are: the US, France, Japan, China, Russian Federation, Republic of Korea, Canada, and Ukraine, with more than 10 gigawatts (GW) of

cumulative installed capacity each. Germany, the UK, Sweden, Spain, India, and Belgium have 5GW-10GW cumulative installed nuclear power capacity each.

Climate change concerns have also raised awareness of the need to reduce the use of fossil fuels in favour of low-emission power sources. Nuclear power is the readily available large-scale alternative to fossil fuels for the production of a continuous and reliable supply of electricity for meeting base-load demand. Nuclear reactors also involve high capacity factors, offering increased reliability, constant supply compared to intermittent renewable sources, such as wind and solar.

Impact of Coronavirus on the Nuclear Industry’s Operations:

The nuclear industry is assessing measures to safeguard their workforce and implementing business continuity plans to ensure continuous functioning of key aspects of their businesses. The nuclear industry already has a robust safety culture in place worldwide. Based on the guidance and directives put into practice across various countries and regions, actions have been taken.

Since the time that coronavirus was first detected in China’s Wuhan region, before becoming a global pandemic, companies worldwide had time to execute business continuity plans and take the necessary steps for the

dealing with the impact of the virus.

Measures have been taken to screen workers and isolate those who show virus symptoms through temperature checks to detect fever, which is among the common Covid-19 symptom. Few countries have advised their staff to work remotely and not on-site, hence aiding with social distancing measures. For example, in the US,

Nuclear technology is a major baseload power-generating source and accounted for 10.3% of global power generation in 2019. The nuclear power sector is growing in many countries as demand for electricity increases. Some 31 countries are currently operating nuclear reactors for their electricity generation.

Few countries have advised their staff to work remotely and not on-site, hence aiding with social distancing measures. For example, in the US, officials have recommended they may isolate or quarantine crucial nuclear power plant technicians and allow them to live onsite to decrease their proximity with others in case this is needed.

officials have recommended they may isolate or quarantine crucial nuclear power plant technicians and allow them to live onsite to decrease their proximity with others in case this is needed. Many operators are getting hold of supplies of food, beds along with other essentials items required to support their staff for this purpose. Key NPP staff could be required to stay in assigned accommodation and commute to and from the nuclear facility in separate transportation. To safeguard the health of workers in regions where the occurrence of coronavirus may rise considerably, actions such as changing shift patterns are being assessed.

Companies are also limiting or dropping their non-essential business travel plans and making use of conference video and audio calls for carrying out business meetings. France's regulator, Nuclear Safety Authority (ASN), is avoiding direct physical contact to stop the spread of the coronavirus and is prioritizing control of operating facilities. A number of inspectors from the UK's regulator, Office for Nuclear Regulation (ONR), will go ahead with travel plans to sites where needed but will restrict most of its business operations via phone, email and Skype.

Currently, NPP operations are continuing in many countries. The US NRC has stated that it may close down any of the country's 60 NPP if they cannot be aptly staffed. Few nuclear facilities have temporarily shut down their operations to avoid the spread of the coronavirus and secure their workforce.

In the UK, authorities have idled a nuclear fuel reprocessing site located at Sellafield after 8% of its 11,500 workforce were asked to self-isolate or quarantine to avoid the spread of the coronavirus

infection. This step came after a staff member was tested Covid-19 positive a few weeks earlier, and will eventually lead to a controlled shutdown of the site's Magnox facility, expected to close down permanently this year. The EDF-owned Hinkley Point C (HPC) NPP in the UK, has also reduced its workforce by more than half and will further decrease its staff members as work in progress is finished.

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Rosatom's overseas NPP construction projects have also progressed under the recommendations and guidelines of the disease control services as well as governments of the corresponding countries where construction work is going on. Work was suspended on few nuclear reactors which are under construction in China following the coronavirus outbreak. Now as work is slowly restarting in the country, countermeasures have been taken for all staff members returning to nuclear site.

France, the most nuclear dependent country in the world, announced scaling down of staff at its Flameville NPP, operated by EDF, the country's major nuclear operator. EDF stated that it is decreasing staff at the NPP from 800 to 100, because of the high regional Covid-19 infection rates. Three workers at the EDF's Fessenheim NPP, Belleville NPP, and Cattenom NPP have already been tested positive for the coronavirus. French grid operator Réseau de Transport d'Électricité (RTE) presumes that nuclear availability will stay 3.6 GW below 2015 to 2019 average, in addition to a national fall in nuclear power demand.

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EDF has withdrawn its 2020 nuclear power generation target amidst an expected drop in its output this year due to the coronavirus outbreak. Orano, an integrated nuclear energy company, has

also withdrawn its financial year outlook for 2020. When it comes to nuclear reactor operations, the Ascó I NPP in Tarragona and Almaraz I NPP in Cáceres, Spain, have notified about rescheduling or delaying of their outages for nuclear fuel loading.

In Germany, NPP operators are stepping up precautionary measures to stop the spread of coronavirus. For instance, RWE, is involved in disinfecting radiation meters which are normally used by staffs quite often. The company has also shut down visitor centres and called off its scheduled group visits to decrease the risk of Covid-19 infections.

The Finnish state-owned energy company Fortum Oyj's Loviisa NPP is also undertaking precautionary measures to help stop the spread of the coronavirus. The company is adhering to the Covid-19 recommendations and guidelines put forward by the World Health Organization (WHO) and national authorities. External visitors are also prohibited at the NPP until further notice.

Mining: Kazatomprom, Kazakhstan's state-owned uranium production company, with a total uranium production volume (100% basis) of 22,808t of elemental uranium (tU) in 2019 has made announcement of drawing on its current uranium inventory if its mining activities are affected. The company's uranium mining sites are located in remote areas of the country and so far the coronavirus outbreak has not yet affected its operations. However, considering the remoteness of these mining sites, the company needs to take precautionary measures if in case any outbreak occurs.

The Canadian uranium company, Cameco, has also temporarily idled production of its Cigar Lake uranium mine located in northern Saskatchewan, Canada, as a response to the Covid-19 pandemic.

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This will reduce the staff members working on-site from around 300 to 35, hence leading to physical distancing and heightened safety precautionary measures. In addition, Cameco's joint venture partner, Orano Canada, has also shut down operations at its McClean Lake uranium mill, which processes ore from the Cigar lake mine.

The IAEA is also providing its support to fourteen countries situated in Africa, Asia, Latin America and the Caribbean to tackle the coronavirus outbreak. It is offering diagnostic kits, equipment as well as training in nuclear-driven diagnostic technique called as Real-Time Reverse Transcription Polymerase Chain Reaction (RT-PCR). This RT-PCR technique enables to detect and pinpoint this coronavirus precisely within hours in humans, along with animals which may host the virus. This method can also provide more information about the exposure and transmission trails of the virus.

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Source: <http://www.power-technology.com>, 01 April 2020.

OPINION – Maximilian Hoell, Emily Enright

Lessons from the London P5 Conference: Why Civil Society Engagement is Key for Success

The five nuclear-weapon states – China, France, Russia, the United Kingdom, and the US (collectively known as the P5) – as recognised by the NPT, convened their tenth formal conference

in London between 12–14 February. The conference addressed ways in which the P5 can better fulfil their responsibilities under the NPT's three pillars: non-proliferation, disarmament and peaceful uses of nuclear technology.

The London discussions of senior P5 representatives and unprecedented P5 engagement with civil society, coordinated by King's College London (KCL) and the European Leadership Network (ELN), were revealing. Continued work through the P5 Process on improved cooperation and transparency is encouraging, yet there remains scope for more to be done to improve transparency and advance the goals of the NPT. In particular, further engagement with civil society is a valuable tool for countering criticism of opacity and for identifying opportunity for progress.

KCL and ELN shadowed the P5 deliberations during the UK's tenure as coordinator of this process. With the aim of increasing the transparency of the P5 nuclear dialogue through expert workshops, the joint KCL-ELN project identified key opportunities and challenges for the P5 process in the lead-up to the 2020 NPT RevCon.

For the February P5 conference, ELN and KCL convened 76 experts (over half of whom were women) to discuss the project's recommendations with senior officials in a two-day 'side event'. The group comprised members from each of the P5 states, as well as 16 non-nuclear weapons states. This represented an unprecedented level of civil society engagement

with the P5 Process, and the various breakout group, small roundtable and plenary settings provided valuable opportunities for the exchange of ideas, responses to criticism, and discussion of avenues of progress for the P5.

The conference provided the P5 with an opportunity to demonstrate their commitment to increased transparency, particularly through the main on-the-record plenary session. The conference revealed agreement amongst the P5 on some topics, such as the Treaty on the Prohibition of Nuclear Weapons (TPNW), strategic risk reduction efforts and the Glossary of Key Nuclear Terms, but mistrust and disagreement over nuclear modernisation programmes and approaches to formal arms control agreements.

The P5 reiterated their joint opposition to the TPNW, which in their view represents a 'dangerous and unrealistic shortcut to nuclear disarmament without addressing the security challenges associated with the existence of nuclear weapons'.

The TPNW also undermines the NPT, according to the P5, because Article 18 suggests that the TPNW supersedes in case of a conflict with other treaties.

With 35 ratifications, there is a chance that the TPNW will reach the required 50 ratifications for entry-into-force before the next RevCon. This possibility has grown with the

postponement of the 2020 RevCon due to the outbreak of COVID-19, buying TPNW supporters more time to persuade potential signatories of the Treaty's value, whilst TPNW signatory states have more time to complete the ratification process. KCL-ELN deliberations found that there is a risk that the P5's continued vocal opposition to the

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TPNW could alienate its' non-nuclear-weapon state proponents—a development that the P5 should seek to avoid by either ignoring the TPNW altogether or by adopting less confrontational language.

An area of agreement between the P5 is the Glossary of Key Nuclear Terms. Formally agreed at the 2009 London P5 conference to foster a common understanding of nuclear terminology, the P5 presented a first edition of the Glossary at the 2015 RevCon, which struck some observers as a distraction from disarmament, offering few original insights as the P5 could not agree on particular terms, and borrowing definitions from existing bilateral and IAEA glossaries. At their February conference, the P5 announced that they had resolved disagreements on additional definitions, paving the way for a second edition to be presented at the next RevCon. The Glossary has received criticism, but the P5 claim a common understanding of key nuclear terms can provide the necessary framework for concrete disarmament measures.

Another more promising area of agreement addressed at the civil society conference was strategic risk reduction. Led by France, the P5 reiterated their willingness to engage in risk reduction activities, announcing efforts to build 'strategic trust amongst the P5' and noting that strategic risk reduction is not an alternative to disarmament.

Though a promising step towards addressing non-nuclear-weapon states' concerns about growing nuclear risk, the P5 stopped short of offering details to the civil society experts about their strategic risk reduction measures. A key recommendation of the KCL-ELN project for increasing P5 transparency and

efficacy in this area is to establish a working group to inventory and mitigate the 'actions, deployments, activities or behaviours [that] could lead to misunderstandings or miscalculations [and] trigger or exacerbate a crisis'.

The P5 also made progress on discussions about their nuclear doctrines. Increasing transparency around doctrines is one way for the P5 to reduce risks associated with

misperceptions of each other's intentions or likely strategic calculus. The P5 assessed such discussions to be so valuable that they agreed to make the doctrines discussion a permanent feature of the P5 Process agenda, and plan to brief non-nuclear-weapon states on their doctrines deliberations at a RevCon side-event.

Though a valuable development, the P5 could better counter the criticism of doctrinal opacity by providing specific examples of how the doctrines discussions have resolved misunderstandings, which they failed to do at the London conference. The P5 could also facilitate constructive engagement with the non-nuclear-weapon states

by 'produc[ing] a joint P5 doctrines paper with the collated responses' to questions allowing the wider NPT membership to better understand their individual doctrines.

Areas of disagreement and a lack of trust amongst the P5 were also evident throughout the conference. P5 members cast doubt on each other's intentions, expressing concerns about nuclear modernisation programmes and alleged non-compliance or deliberate undermining of arms control agreements. China rejected calls

There is a risk that the P5's continued vocal opposition to the TPNW could alienate its' non-nuclear-weapon state proponents—a development that the P5 should seek to avoid by either ignoring the TPNW altogether or by adopting less confrontational language.

P5 members cast doubt on each other's intentions, expressing concerns about nuclear modernisation programmes and alleged non-compliance or deliberate undermining of arms control agreements. China rejected calls for trilateral arms control talks with Russia and the US for as long as the nuclear arsenals of all three remained unequal.

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The London civil society conference provided the P5 with an opportunity to demonstrate their commitment to transparency and to discuss key issues with civil society experts. While progress within the P5 Process is encouraging; there remains scope for improvement. The joint KCL-ELN project has identified opportunities and challenges for the P5 and has resulted in practical recommendations to better fulfil their NPT obligations as the next RevCon approaches. Postponement of this key event will provide additional time for the P5 to build towards greater transparency and cooperation. To ensure success in this NPT review cycle and beyond, the P5 must more seriously consider the value of civil society engagement, and leverage the recommendations of NGO projects to improve the efficacy and transparency of their own work and to counter criticism of opacity.

Source: <http://www.europeanleadershipnetwork.org>, 02 April 2020.

NUCLEAR STRATEGY

CHINA

State Department is Reportedly Concerned China is Conducting Nuclear Tests

A new arms-control report expected to be made public by the State Department shows the United States is concerned that China is conducting secret nuclear tests despite a pledge against doing so, *The Wall Street Journal* reports.

There's reportedly no proof China is violating the CTBT, and the alleged tests are reportedly not very powerful, but Washington's suspicions are driven by "high tempo" activity at China's Lop Nur test site, extensive excavations at the site, and

Beijing's "purported use of special chambers to contain explosion," per the Journal.

Additionally, the U.S. noticed interruptions in data transmission of radioactive emissions and seismic tremors from Chinese monitoring stations — which are part of an international network of sites to verify treaty compliance — in recent years. The Trump administration's report claims the data was deliberately blocked by Beijing, but a spokeswoman for the body that oversees the international test ban treaty, said those interruptions came during a negotiating process between the CTBT organization and the Chinese government.

Either way, the report could certainly exacerbate tensions between Washington and Beijing, which are already rising because of longstanding

trade disputes and, more recently, the U.S.'s criticism of China's handling of the novel COVID-19 coronavirus outbreak that originated in Wuhan.

Source: <https://theweek.com/speedreads/908955/trump-reportedly-scrapped-idea-daily-radio-show-avoid-competition-rush-limbaugh>, 15 April 2020.

USA

President Trump 'Talked about Nuclear Weapons' with Vladimir Putin

President Trump told reporters that he discussed nuclear arms control during his latest conversation with Russian President Vladimir Putin over the weekend. The US president shared a phone call with Putin on 12 April, just hours after he helped broker a historic deal with the OPEC+ to shore up plummeting oil prices amid the coronavirus pandemic - and bring an end to the oil price war between Russia and Saudi Arabia.

Trump revealed the contents of the call during the White House's daily coronavirus press briefing, saying though oil remained the primary topic of

conversation the two world leaders also discussed nuclear weapons. 'We did talk about the arms. Yes, we did,' Trump told reporters from the podium when asked what was discussed between him and Putin on the subject of strategic security. 'It was a very important part of the call actually.'

Patriot missile launchers and two other short-range systems are now in place at al-Asad Air Base, where Iran carried out a massive ballistic missile attack against U.S. and coalition troops in January, and at the military base in Irbil.

Though Trump failed to divulge specifically in what context he and Putin spoke 'about arms', the Russian president's press secretary, Dmitry Peskov, later clarified the two leaders actually discussed the limitation of strategic offensive arms - known as the New START Treaty - which expires in 2021. Trump added that he and Putin also discussed issues concerning China. ...

Source: Luke Kenton, <https://www.dailymail.co.uk/news/article-8216245/President-Trump-talked-nuclear-weapons-Vladimir-Putin-call-weekend.html>, 14 April 2020.

BALLISTIC MISSILE DEFENCE

IRAQ

Patriot Missile Defense Systems Now Active in Iraq, Say US Officials

New air defense systems are now protecting American and allied forces at military bases in Iraq where troops have been attacked by Iranian-backed insurgents in recent months, according to U.S. officials. Patriot missile launchers and two other short-range systems are now in place at al-Asad Air Base, where Iran carried out a massive ballistic missile attack against U.S. and coalition troops in January, and at the military base in Irbil, said officials, who spoke on condition of anonymity to discuss sensitive weapons movement. A short-range rocket defense system was installed at Camp Taji.

President Donald Trump said his administration has received intelligence that Iran is planning a strike. He provided no details, but he warned Iran in a tweet that if U.S. troops are attacked by Iran or its proxies, "Iran will pay a very heavy price, indeed!"

The military has been gradually moving the defensive systems into Iraq over the last few months to provide more protection for troops that have seen a series of rocket and missile attacks. Soon after Iran launched a massive ballistic missile assault against troops at al-Asad in January, questions were raised

about the lack of air defense systems at the bases. But it has taken time to overcome tensions and negotiate with Iraqi leaders, and to also locate defense systems that could be shifted into Iraq. Prior to the missile attacks, U.S. military leaders did not believe the systems were needed there, more than in other locations around the world where such strikes are more frequent.

The systems are now operational, as top U.S. officials warn that threats from Iranian proxy groups continue. Gen. Mark Milley, chairman of the Joint Chiefs of Staff said that because of that threat, hundreds of soldiers from the 1st Brigade, 82nd Airborne Division, remain in Iraq. He said only one battalion was allowed to return to Fort Bragg, N.C., "in part because the situation with the Shia militia groups and Iran has not 100 percent settled down." He added that "they will continue their mission until such time that we think the threat has subsided."

Several rockets hit near the site of an American oilfield service company in southern Iraq. It was the first such attack in recent months to target U.S. energy interests. Americans had already left the location. President Donald Trump said his administration has received

intelligence that Iran is planning a strike. He provided no details, but he warned Iran in a tweet that if U.S. troops are attacked by Iran or its proxies, "Iran will pay a very heavy price, indeed!"

Other officials in recent weeks said there had

been an increase in intelligence pointing to a possible large attack. But they said that the threat appears to have tapered off, as countries grapple with the rapidly spreading coronavirus. Still, military leaders have argued that U.S. and coalition troops needed the extra protection because threats from the Iranian proxies continue and it's unclear how much control Tehran may have over them, particularly now as the virus hits Iran hard.

The Patriot batteries, which are designed to protect against missiles are at al-Asad and Irbil. In addition, the so-called Army C-RAM system is being used and is able to take out rockets and mortars. And the more sophisticated Avenger air defense system can counter low-flying missiles and aircraft, including drones and helicopters. ... Currently, there are more than 6,000 U.S. troops in Iraq. While some forces have been withdrawn over the past few months, others have flowed in to set up and operate the new air defense systems.

Source: Lolita C. Baldor, The Associated Press, <https://www.defensenews.com/land/2020/04/13/patriot-missile-defense-systems-now-active-in-iraq-say-us-officials/>, 13 April 2020.

NORTH KOREA

North Korea Fires Barrage of Missiles from Ground and Air

A barrage of North Korean missiles fired from both the ground and fighter jets splashed down on the waters off the country's east coast on 14 April, South Korea's military said, a show of force on the eve of a key state anniversary in the North and parliamentary elections in the rival South.

The back-to-back launches were the latest in a series of weapons tests that North Korea has conducted in recent weeks amid stalled nuclear talks and outside worries about a possible coronavirus outbreak in the country. North Korean troops based in the eastern coastal city of Munchon first launched several projectiles — presumed to be cruise missiles — South Korea's Joint Chiefs of Staff said in a statement.

The weapons flew more than 150 kilometers at a low altitude off the North's east coast, a South

Korean defense official said. If confirmed, it would be the North's first cruise missile launch in about three years, said the official, who spoke on condition of anonymity, citing department rules.

... Some experts say North Korea likely used the latest weapons launches to bolster its striking capability against South Korea, which has been introducing U.S.-made stealth F-35 jets and other sophisticated conventional weapons systems in recent years. Others say the latest weapons tests were also aimed at shoring up internal unity in the face of U.S.-led sanctions and the coronavirus pandemic.

... If the cruise missiles tested on 14 April were newly developed weapons, they would still present a challenge to the South Korean and U.S. militaries, Go said. South Korea's military said it was analyzing details of the launches. The launches came a day before North Korea marks the 108th birthday of the country's late founder, Kim Il Sung, the grandfather of Kim Jong Un. They also came a day ahead of South Korean parliamentary elections. ...

Source: Hyung-Jin Kim, Associated Press, 14 April 2020.

NUCLEAR ENERGY

BELARUS

Belarus to Launch New Nuclear Power Plant this Autumn

Officials in Minsk say a nuclear power plant being constructed in western Belarus will be launched during the summer and start producing electricity in the autumn. Energy Minister Viktor Karankevich announced the timetable for the Belarusian nuclear power plant on April 11 during an interview with the Belarusian TV channel ONT.

...The plant is being built in the town of Astravets near the border with Lithuania. It is just 40 kilometers from Lithuania's capital, Vilnius. In January, Lithuanian Energy Minister Zygimantas Vaiciunas told RFE/RL that the Belarusian plant is "a threat to our national security, public health, and environment." "The key question is the site

selection, which was done politically — geopolitically,” Vaiciunas told RFE/RL.... The general contractor for the Belarusian nuclear power plant building is Atomstroieksport, an affiliate of Russia’s state-owned Rosatom.

Source: <https://oilprice.com/Latest-Energy-News/World-News/Belarus-To-Launch-New-Nuclear-Power-Plant-This-Autumn.html>, 14 April 2020.

CHINA

China Says Virus Outbreak will Not Impact Nuclear Power Plant Construction

The coronavirus outbreak will have no impact on the progress of nuclear power plant construction in China in the short term, and reactors already in operation have not been affected, a nuclear safety official said on 15 April 2020. All 15 unfinished reactor units had resumed construction and no plants now in operation were suspended during the outbreak, Tang Bo, director of the nuclear safety inspection department at the Ministry of Ecology and Environment (MEE), told reporters.

China originally aimed to bring total nuclear capacity up to 58 gigawatts (GW) by the end of this year, and have another 30 GW under construction, but it is not expected to meet the targets due to prior project delays and a halt in new approvals. China was initially expected to approve at least six new nuclear projects this year. It had a total of 47 plants in operation by the end of last year, with total capacity at 48.75 GW.

At the same briefing, Jiang Guang, director of the MEE’s radiation safety department, said China was actively looking for new sites to build nuclear waste treatment plants, and it would also expand

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underground high-radiation waste treatment programme.

Source: Reporting by Muyu Xu and David Stanway, <https://af.reuters.com/article/commoditiesNews/idAFL3N2C311B>, 15 April 2020.

INDIA

Nuclear Power Plants of 7,000 MW Capacity under Construction in India

Nuclear power plants of 7,000 MW capacity are currently under various phases of construction in the country, according to data shared by power minister R K Singh in parliament recently. The plants under construction include Unit 3, 4 and 5 of Kudankulam Nuclear Power Project of 3,000 MW capacity and a 500 MW capacity Prototype Fast Breeder Reactor in Tamil Nadu. Apart from this, there are two upcoming 1,400 MW capacity

nuclear power plants including Kakrapar Atomic Power Plant in Gujarat and the Rajasthan Atomic Power Station.

A 700 MW project, Gorakhpur Nuclear Power Plant, has also been planned on a 560 hectare area situated west of

A 700 MW project, Gorakhpur Nuclear Power Plant, has also been planned on a 560 hectare area situated west of Gorakhpur village in Fatehabad district of Haryana. India is planning to add around 20,000 Mw nuclear power generation capacity over the next decade.

Gorakhpur village in Fatehabad district of Haryana. India is planning to add around 20,000 Mw nuclear power generation capacity over the next decade, KN Vyas, Secretary, DAE and Chairman, Atomic Energy Regulatory Commission had said in October 2019.

In the current financial year, total investment by the central Public Sector Undertakings under the DAE is likely to stand at Rs 14,851 crore. State-owned NPCIL will alone account for 98 per cent of that planned spending.

Source: <http://www.energy.economictimes.indiatimes.com>, 05 April 2020.

URANIUM PRODUCTION

KAZAKHSTAN

Kazakhstan Cuts Uranium Production Because of Coronavirus

Kazakhstan's national operator for the import and export of uranium, Kazatomprom, is cutting production and putting non-essential workers on furlough across the country to ensure the well-being of employees amid the global outbreak of the novel coronavirus.

According to a statement, the measures taken by the country's government to contain the spread of the deadly virus have impacted all regions in which Kazatomprom operates. "The measures introduced by the government of Kazakhstan, including restrictions on movement and strict public health measures, already cover all regions of Kazatomprom's presence, and are clearly observed at all our enterprises and facilities," the company's CEO, Galymzhan Pirmatov said.

Officials in Kazatomprom believe the safety and wellbeing of its employees are of paramount importance. "As many employees as possible will be put on furlough to comply with the measures introduced and to minimize the risk for infection and possible outbreak," Pirmatov said, adding that essential workers will remain on sites in accordance with

social distancing guidance.

The pay cut, however, is not expected as furloughed staff will remain contracted to Kazatomprom and will be paid as usual, according to the statement. Kazatomprom's facilities across Kazakhstan will be working at reduced capacity within three months which is expected to cause production cuts by about 17.5 percent in 2020. Before a state of emergency was declared in what is Central Asia's largest country, the company was expecting the production output to reach about 22,800 tons in 2020.

"The company expects Kazakhstan's uranium production in 2020 to decline by no more than 4,000 tons, although the exact quantitative effect

on production may differ from this estimate," reads the statement. At the same time, the production cuts are not expected to affect the company's sales obligations for 2020, the company said, adding that it had already informed all

of its customers on recent updates.

Kazakhstan possesses about 12 percent of the world's recoverable uranium, with 50 known deposits and 22 uranium mines operated by the state-owned Kazatomprom and through joint ventures. Kazatomprom is one of the world's largest producers of uranium, with the production counting for approximately 24 percent of global primary uranium production as of 2019. All of the company's mining operations are located in Kazakhstan. Meanwhile, production cuts are nothing new for the company.

In 2017, the company announced that it will cut uranium production by 20 percent due to "the challenging market conditions." Global uranium prices dropped by over 70 percent following the Fukushima nuclear power accident in March 2011,

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while the world's largest publicly traded uranium company, Cameco, was forced to suspend production in a bid to reduce oversupply in the market.

Source: <http://www.caspiannews.com>, 08 April 2020.

NUCLEAR COOPERATION

IAEA–UK

IAEA and UK's National Nuclear Laboratory to Cooperate on Sustainability of Nuclear Power

The IAEA and the National Nuclear Laboratory (NNL) of the United Kingdom have agreed to strengthen their cooperation in support of a sustainable future for nuclear power, including activities on existing and emerging nuclear reactor technologies as well as decommissioning and radioactive waste management.

The two organizations have signed a Practical Arrangement, building on a long-standing relationship that already included tangible outcomes, such as the NNL's contribution to the planning and implementation of the IAEA 2019 International Conference on Climate Change and the Role of Nuclear Power. "The Practical Arrangement will be of particular value for those countries currently relying on nuclear power or that foresee a role for nuclear power in sustainable energy systems of the future," said Dohee Hahn, Director of the IAEA Division of Nuclear Power. "I look forward to more results still to come."

The agreement identified several activities in which cooperation may be pursued, including:

- Increasing the efficiency of operating nuclear power plants;
- Good practices in stakeholder involvement;
- Good practices in innovation for existing and

future nuclear power reactor designs;

- Advanced nuclear technologies, including small modular reactors and innovative nuclear energy systems;
- Decommissioning and radioactive waste management and disposal.

"It's great to see this successful relationship being broadened and strengthened in this way, and this in turn represents an exciting opportunity for NNL and IAEA to work together to jointly tackle some of the greatest challenges facing all aspects of our sector," said James Murphy, NNL's Chief Strategy Officer. "Only through important collaborations of this kind will we ensure nuclear can continue to play its vital role in the global low carbon economy."

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... The next edition of the Global Nuclear Innovation Forum, jointly organized by the IAEA, NNL, the US Electric Power Research Institute, Electricite de France and the Nuclear Energy Agency of the Organisation for Economic Co-operation and Development, is scheduled to be held in London, UK, in late 2020.

Source: <http://www.iaea.org>, 09 April 2020.

NUCLEAR SECURITY

GENERAL

IAEA Steps Up Support for Nuclear Facility Operators during COVID-19 Crisis

Nuclear facility operators around the world are taking special measures to protect the health of their workforce to ensure continuous operations during the Covid-19 crisis. The IAEA is accelerating its efforts to support them by facilitating knowledge exchange through the International Reporting System for Operating Experience (IRS) and the newly established COVID-19 Operational Experience Network.

Reduced staffing and telecommuting are among a number of special measures put in place by operators of nuclear power plants, research reactors and other nuclear facilities. Others include social distancing, regular medical screenings of staff, sterilization of work areas and purchase by the operator of specific personal protective equipment, travel restrictions, self-isolation, and meeting restrictions.

...“Operators have primary responsibility for safety and security. They are acting responsibly in taking these sensible precautions and carefully planned organizational changes, while continuing to ensure safety and security, and which are typically reviewed by national nuclear regulatory bodies,” said Peter Tarren, Head of the IAEA’s Operational Safety Section.

Some of the special measures implemented include the extension of regular procedures such as reduced staffing, which is a common practice on weekends while other staff remain on call if needed. Other new measures announced by some operators to minimize disease spread and maintain a safe complement of essential personnel include offsetting work hours, revised shift patterns, alternative ways of communicating with control room personnel or even asking essential staff to live at the site temporarily.

In the context of the unfolding pandemic, the IAEA safety standards in particular require that staffing levels be adequate to operate and shut down a reactor and maintain safety during the shutdown process. For this, a core group of staff should be identified for operating the reactor

safely, Tarren said.

To help operators and regulators learn from each other’s experience, the IAEA is gathering relevant practices through the IRS, an online platform jointly managed with the Nuclear Energy Agency of the Organisation for Economic Co-operation and Development, through which countries submit and respond to reports on events of international interest for the purpose of enhancing safety practices at nuclear facilities.

“The IAEA is gathering feedback from operating countries about how they are ensuring that enough personnel are available to keep power plants operating safely and securely,” Tarren said. “They have shown determination and innovation in designing measures that reduce the risk of their staff contracting COVID-19, and their willingness to share this information through the IRS is extremely helpful for all participating countries.”

In addition, to assist nuclear facility operators in the current crisis, the IAEA has launched the COVID-19 Operational Experience Network, a pilot peer-to-peer network designed to serve as a repository for planned or implemented response actions during the crisis.

“The information in this network will include ways to limit the pandemic’s spread, definitions of critical competences for power plant operations and access restrictions,” said Pal Vincze, Head of the IAEA’s Nuclear Power Engineering Section. “It also focuses on specific organizational preparedness arrangements for COVID-19 and includes data on planned outages in response to the crisis.”

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The IAEA Nuclear Energy Series publication *Industrial Safety Guidelines for Nuclear Facilities* provides operators with information on preparing and implementing plans for responding to a wide range of hazards, including pandemics. The plans help to ensure that employees minimize the potential for contracting the applicable disease and that the nuclear facility has sufficient healthy staff available to maintain safe operation.

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Despite the COVID-19 crisis, all 442 of the world's nuclear power reactors are operational, providing more than 10% of the world's electricity, according to the IAEA's Power Reactor Information System. "By collecting and sharing these experiences, the IAEA aims to provide expanded knowledge for operators around the world to strengthen their capacity to respond to this crisis and any similar ones in the future," Vincze said. The information gathered this way will be taken into consideration in the revision of relevant IAEA documents, he added.

Maintaining the Safety and Security of Research Reactors and Fuel Cycle

Facilities: As the COVID-19 situation continues to unfold, nuclear facilities other than power plants such as research reactors and fuel cycle facilities face similar operational challenges.

Along with the universities and research institutions in which they operate, many research reactors that focus on training and research are in temporary shutdown – a state in which a reactor's operations are on hold until circumstances change. IAEA Safety Standard SSR-3 provides information on maintaining the safety of research reactors as well as staff arrangements and staffing levels during extended periods of shutdown.

Most research reactors whose production of isotopes used in medicine is vital for health care continue to operate at reduced staffing levels. The IAEA is currently reaching out to operators who are members of its Technical Working Group on

Research Reactors to gather information on the status of research reactors that produce medical isotopes during the COVID-19 crisis as well as issues related to world-wide supply.

Guidance to operators of fuel cycle facilities, which are used to convert and enrich uranium and manufacture reactor fuel, is available in IAEA Safety Standards SSR-4, including on operations under various constraints.

Nuclear security considerations are paramount and security needs to be maintained whether or

not a facility is operational. While a pandemic such as COVID-19 does not typically affect nuclear security threat assessments, operators need to adapt and implement measures to ensure that nuclear materials in facilities that are not actively used are protected according to requirements for materials

While a pandemic such as COVID-19 does not typically affect nuclear security threat assessments, operators need to adapt and implement measures to ensure that nuclear materials in facilities that are not actively used are protected according to requirements for materials in storage.

in storage, said Muhammad Khaliq, Head of the IAEA Nuclear Security of Materials and Facilities Section.

Source: <http://www.iaea.org>, 08 April 2020.

NUCLEAR SAFETY

BELARUS

Belarusian Gosatomnadzor Ready to Discuss Nuclear Safety after COVID-19 Situation Gets Stabilized

Gosatomnadzor is ready to discuss national reports on fulfilling the Nuclear Safety Convention on the platform of the IAEA after the situation with

COVID-19 is stabilized, BelTA learned from Olga Lugovskaya, Head of the Nuclear and Radiation Safety Department of the Belarusian Emergencies Ministry (Gosatomnadzor).

The official said: "As for the defense of the national report, it has to happen at a review meeting of the parties. A review meeting was scheduled to take place in the IAEA HQ in Vienna on 23 March – 3 April. Taking into account the epidemiological situation in the world the event was postponed for an indefinite period of time but it will happen sooner or later. We are ready to discuss our report and national reports of other countries. We are ready to have a multilateral dialogue and make our own contribution to the global strengthening of nuclear safety."

According to the Gosatomnadzor head, the Belarusian report met an increased interest of the contracting parties. As many as 239 questions regarding the report were submitted remotely. Only Finland, Russia, and China received more questions. Comprehensive answers were given to every question.

Most of the questions focused on the sections concerning the regulatory authority, safety evaluation and verification, and radiation protection. The contracting parties also demonstrated strong interest in the assimilation of proposals and recommendations put forward as a result of IAEA assessment missions and peer reviews in Belarus.

Source: <http://www.atom.belta.by>, 09 April 2020.

UKRAINE

Ukraine Says Forest Fire 'No Threat' to Chernobyl Nuclear Plant

Forest fires are raging in a contaminated area near the defunct Chernobyl nuclear plant, but Ukrainian officials insisted there is no radiation threat. Hundreds of firefighters backed by aircraft have battled several forest fires around Chernobyl. They managed to contain the initial blaze, but new fires flared close to the decommissioned plant.

Environmental activists warned the fire, near the site of the world's worst nuclear disaster in 1986, posed a radiation risk. Volodymyr Demchuk, a senior official from Ukraine's emergency service, said the situation was under control. "There is no threat to the Chernobyl nuclear power plant, waste fuel storage or other critical facilities," he said in a video statement late. The emergency service said radiation levels in the capital, Kyiv, about 100km (60 miles) south of the plant, were within norms.

President Volodymyr Zelenskyy has promised transparency on the issue and will meet the head of the emergency service. "Society must know the truth and be safe," he said in a statement.

...The environmental campaign group said that analysis of satellite images showed the fire at its closest point was just 1.5km (less than a mile) from the protective dome over the ruined reactor. Government agencies insist the fire has not caused a spike in radiation levels.

Chernobyl polluted a large swath of Europe when its

fourth reactor exploded in April 1986. People are not allowed to live within 30km (18 miles) of the power station. The three other reactors at Chernobyl continued to generate electricity until the power station finally closed in 2000. A giant protective dome was put in place over the fourth reactor in 2016.

Source: <https://www.aljazeera.com/news/2020/04/ukraine-forest-fire-threat-chernobyl-nuclear-plant-200414110232992.html>, 14 April 2020.

NUCLEAR PROLIFERATION

IRAN

Iran Urged to Declare Newly Revealed Nuclear Weapons Site to IAEA

The prestigious Washington-based Institute for Science and International Security published a jaw-dropping report on its website outlining a newly revealed Iranian regime nuclear weapons

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plant that was discovered by Israel. The authors of the report indicate that “Iran should declare this site to the IAEA and allow its inspection, since the facility was designed and built to handle nuclear material subject to safeguards under Iran’s comprehensive safeguards agreement.”

The three scientists David Albright, Sarah Burkhard and Frank Pabian wrote that “based on documents in the Iran Nuclear Archive, seized by Israel in early 2018, Iran’s Amad Plan created the Shahid Mahallati Uranium Metals Workshop near Tehran to research and develop uranium metallurgy related to building nuclear weapons.”

David Albright, the founder of the Institute for Science and International Security, told *The Jerusalem Post* that what “jumped out at us was the plant could have made cores for the first bomb parts.” He added that over time the facility “could have made four nuclear missiles.” The Shahid Mahallati plant allowed Iran to learn on a pilot scale to shape metal for atomic bomb parts, Albright said.

The report said the “the facility was intended as a pilot plant, aimed at developing and making uranium components for nuclear weapons, in particular components for weapons-grade uranium, the key nuclear explosive material in Iranian nuclear weapon cores. The site was meant to be temporary, until the production-scale Shahid Boroujerdi facility at Parchin was completed.”

The Islamic Republic of Iran’s activities at the Shahid Mahallati facility show deception, according to the report. “Iran has clearly been

dishonest with the IAEA. During discussions in September 2015, ‘Iran informed the Agency that

it had not conducted metallurgical work specifically designed for nuclear devices, and was not willing to discuss any similar activities that did not have such an application,” the report read, however, the “activities at Shahid Mahallati and Shahid Boroujerdi are a dramatic contrast to that statement.”

Iran has clearly been dishonest with the IAEA. During discussions in September 2015, ‘Iran informed the Agency that it had not conducted metallurgical work specifically designed for nuclear devices, and was not willing to discuss any similar activities that did not have such an application,’” the report read, however, the “activities at Shahid Mahallati and Shahid Boroujerdi are a dramatic contrast to that statement.

The Shahid Mahallati facility, which is located near Tehran, “was capable of making the first cores of weapon-grade uranium, in case Shahid Boroujerdi was unfinished when weapon-grade uranium would have had become available,” the authors added. The organization posted two images on

its website that show two images of the site as it looked in 2002 and 2003.

The scholars noted that while “the available information does not show that this facility had yet handled any uranium, the site was designed and built to process uranium into nuclear weapon components, under a plan

to undermine Iran’s obligation to subject all such material to safeguards under its comprehensive safeguards agreement, with full knowledge that its actions would violate its commitment under the Nuclear Non-Proliferation Treaty not to manufacture nuclear weapons.”

... The revelation by the Institute for Science and International Security will add more weight to America’s position in its efforts to persuade European powers to abandon the JCPOA and reimpose sanctions on the Islamic Republic of Iran.

The Amad Plan was downsized in late 2003 before this plant processed any weapon-grade uranium, although it did process a considerable amount of a non-uranium surrogate material into weapon components. The use of a surrogate material allowed Iran’s nuclear weapons program to learn and practice the fabrication of key nuclear weapon components.

Iran's regime has breached the JCPOA since it was negotiated in 2015.

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Source: <http://www.jpost.com>, 08 April 2020.

SAUDI ARABIA

Saudi Arabian Nuclear Reactor Nears Completion, Bringing Prospect of Saudi WMD

Bloomberg reported that Saudi Arabia's first nuclear reactor is nearing completion. It purchased the reactor from the Argentinian company, INVAP. But construction and installation of the plant has proven a huge payday for companies in several European countries and the US.

After the Obama administration hesitated to support the project, Trump offered full-throated support. One of the most attractive propositions in the deal for him was the lucrative contracts for US businesses who participated.

The reactor is one of the crowning achievements of Crown Prince Mohammed bin Salman (aka "the Headchopper") in his plan to "modernize" and "reform" the Saudi Arabian economy and military. Part of his ambition has been to project his country's power and interests in more muscular fashion in the region. One of the ways he did this was to invade Yemen and rain terror upon the Houthi regions of that country killing 100,000

Yemenis and starving even more with a crippling blockade.

Saudi Arabia's chief regional rival has been Iran. The purpose of the reactor is to send a loud and clear message that Iran's nuclear ambitions will be met step-for-step by MBS. If Iran gets nuclear weapons, the Crown Prince wants to be right behind. The problem with this approach is that Iran, which has not made such a weapon though it could have if it wanted, has pursued a careful, calibrated approach. While the Saudis have pursued a reckless, aggressive approach in every operation they undertake to project their military power. ...

Source: Richard Silverstein, <http://www.richardsilverstein.com>, 11 April 2020.

NUCLEAR WASTE MANAGEMENT

CANADA

Borehole Drilling Stops Near Ignace

The Nuclear Waste Management Organization has suspended all borehole drilling activity in the Ignace area, to help stop the spread of COVID-19. Technical site evaluations and borehole drilling have been suspended, but remote technical work is continuing in the community. Work near the Revell Batholith formation between Ignace and Wabigoon Lake has also been suspended.

Earlier this month, the NWMO submitted their 2017 to 2019 Triennial Report to the Ministry of Natural Resources, which was required by the federal government and will be tabled in Parliament. "Throughout this reporting period, bold steps are evident in all our work – in advancing site selection, in validating our technical solutions, and in leading by example with our Reconciliation journey," said Laurie Swami, President and CEO of the NWMO. The NWMO is continuing to look for the most suitable location for their 150-year,

Saudi Arabia's chief regional rival has been Iran. The purpose of the reactor is to send a loud and clear message that Iran's nuclear ambitions will be met step-for-step by MBS. If Iran gets nuclear weapons, the Crown Prince wants to be right behind.

\$23 billion nuclear waste repository, and have narrowed their search down to Ignace or South Bruce. A decision is expected by 2023.

Once the two communities are narrowed down, geological and safety research will continue in each of the two communities until 2023, when a final community is expected to be selected. The project's timeline states the repository would be built by 2033, with operations beginning in 2043. The project began in 2010.

The site selection process is expected to create up to 95 local jobs, with up to 1,000 jobs in Ontario. Site construction is expected to need 800 local jobs, and operations will be roughly 700 local jobs. Extended monitoring over 70 years will be roughly 170 local jobs, and decommissioning the repository will create 250 jobs.

The repository would only hold Canadian nuclear waste, and would be one of the first in the world. Currently, Finland is the only other country with a deep geological nuclear waste repository. Finland and Sweden both have similar facilities for radioactive waste, with France not far behind.

The project will also include a scientific Centre of Expertise near the repository, where scientists and geologists would be able to showcase the work going on within the repository. It would also act as a scientific hub for the region, allowing and showcasing local, national and international research. It would be built by 2024. The NWMO operates on a not-for-profit basis and derives its mandate from the federal Nuclear Fuel Waste Act. Canada's plan calls for the NWMO to identify a single, preferred site to host the project, in an

area with informed and willing hosts, by 2023.

Source: <http://www.drydennow.com>, 11 April 2020.

USA

Nuclear Agency Proposes Deregulating Disposal of Some US Radioactive Waste

The US NRC is facing protests after proposing that low-level radioactive waste be disposed of in

commercial landfills not explicitly designed to hold it, rather than at licenced radioactive waste sites. The NRC's proposal, issued in March, declares that the agency's intent is to limit this deregulation to 'very low level radioactive wastes', but Public Employees for Environmental

Responsibility (Peer) states that the actual proposal allows doses to the public equivalent to more than 900 chest x-rays over a lifetime, with a cancer risk 20 times higher than the upper end of the US Environmental Protection Agency's acceptable risk range.

In addition, Peer – which is comprised of government scientists, land managers, environmental law enforcement agents and others – says that this NRC 'interpretive rule' would allow unlicensed radioactive waste dumps to expose the public to levels of radiation two-and-a-half times higher than that permitted for licensed low-level

radioactive waste sites under current NRC regulations. 'Under this plan, the public would never even know that radioactive waste is being dumped near them, because current requirements of public notice and opportunity for a hearing and

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The government assumes that nuclear will contribute 20 per cent to the Polish energy mix. Government Plenipotentiary for Strategic Energy Infrastructure, Piotr Naimski says "in 20 years, we want to produce 6-9 gigawatts of nuclear power, which will mean that we will build six reactors in several places in Poland." It is still unknown where the first Polish nuclear power plant will be built.

independent review by an Atomic Safety and Licensing Board would no longer apply,' stated Peer's Pacific director, Jeff Ruch.

For its part, the NRC anticipates that its proposal would provide 'an efficient means' for it to issue specific exemptions for disposal, or for licensees to transfer appropriate material to these exempt

facilities. Comments on the NRC's proposal are due by 20 April.

Source: Rebecca Trager, <https://www.chemistryworld.com/news/nuclear-agency-proposes-deregulating-disposal-of-some-us-radioactive-waste/4011533.article>, 15 April 2020.



Centre for Air Power Studies

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

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