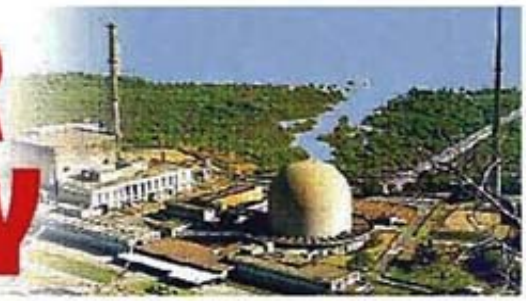
NUCLEAR SECURITY



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

Vol 13, No. 2, 15 NOV. 2018

OPINION – Rakesh Sood

Preserving the Taboo: On Nuclear Arms Control

In October, U.S. President Donald Trump declared that the U.S. is quitting the INF Treaty, a bilateral agreement with Russia signed in 1987. The decision was not unexpected since the U.S. has long maintained that Russia has been violating the treaty and Mr. Trump has been critical of arms control agreements because, according to him, other countries cheat putting the U.S. at a disadvantage.

Mr. Trump's decision has generated dismay and concern that this will trigger a new nuclear arms race in Europe and elsewhere. What it ignores is that the INF Treaty reflected the political reality of the Cold War — of a bi-polar world with two nuclear superpowers — no longer consistent with today's multi-polar nuclear world. The greater challenge today is to understand that existing nuclear arms control instruments can only be preserved if these evolve to take new realities into account. Under the INF Treaty, the U.S. and the U.S.S.R. agreed to eliminate within three years all ground-launched-missiles of 500-5,500 km range and not to develop, produce or deploy these in future. The U.S. destroyed 846 Pershing IIs and GLCMs; and the U.S.S.R., 1,846 missiles (SS-4s, SS-5s and SS-20s), along with its support facilities.

What it ignores is that the INF Treaty reflected the political reality of the Cold War — of a bi-polar world with two nuclear superpowers — no longer consistent with today's multi-polar nuclear world. The greater challenge today is to understand that existing nuclear arms control instruments can only be preserved if these evolve to take new realities into account.

Politics of Negotiations: The INF Treaty was widely welcomed, especially in Europe because these missiles were deployed in Europe and the treaty was signed on December 8, 1987 in Washington by U.S. President Ronald Reagan and Soviet General Secretary Mikhail Gorbachev. Reagan had earlier declared, "A nuclear war cannot be won and must never be fought," marking a ratcheting down of Cold War tensions that had been rising. By the early 1980s, the U.S.S.R. had accumulated

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nearly 40,000 nuclear weapons, exceeding the U.S. arsenal. In Europe, Russia replaced single warhead SS-4s and SS-5s with more accurate 3-warhead SS-20 missiles, heightening concerns. To reassure its NATO allies about its nuclear umbrella, the U.S. began deploying Pershing IIs and GLCMs in the U.K., Belgium, Italy and West Germany, setting off a new arms race.`

The U.S. agreed, Europe breathed a sigh of relief and the INF was hailed as a great disarmament treaty even though no nuclear warheads were dismantled and similar range air-launched and sea-launched missiles were not constrained. Since it was bilateral, the INF Treaty did not restrict other countries but this hardly mattered as it was the age of bi-polarity and the U.S.-U.S.S.R. nuclear equation was the only one that counted.

Growing rhetoric made the Europeans nervous. Realisation dawned that any nuclear conflict on European soil would only lead to more European casualties, catalysing a movement for 'no-deployments' in Europe. In the 1980s, the U.S. and the U.S.S.R. began three sets of parallel negotiations — on strategic weapons leading to the START, on intermediate-range weapons leading to the INF, and the Nuclear and Space Talks to address Soviet concerns about Reagan's newly launched 'space wars' programme (Strategic Defense Initiative).

The INF talks originally considered equal ceilings on both sides but then moved to equal ceilings and non-deployment in Europe to address the sensitivities of allies. The U.S.S.R. wanted British and French missiles of similar ranges to be covered but the U.S. rejected the idea as also the inclusion of older 72 Pershing I missiles already deployed in Germany. To break the stalemate, German Chancellor Helmut Kohl made an announcement that Germany would unilaterally dismantle the Pershing 1s while the U.S.S.R. came up with a double global zero covering both shorter-range and intermediate-range missiles.

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Changing Political Backdrop - Fast Forward to 2018: Since 2008, the U.S. has voiced suspicions that with the Novator 9M729 missile tests, Russia was in breach; in 2014, U.S. President Barack Obama formally accused Russia of violating the INF Treaty. However, he refrained from withdrawal on account of European concerns. On the other hand, Russia alleges that the U.S. launchers for its missile defence interceptors deployed in Poland and Romania are dual capable and can be quickly reconfigured to launch Tomahawk missiles, constituting a violation. China has always had a number of Chinese missiles in the 500-5,500 km range but its modernisation plans, which include the commissioning of the DF-26, today raise the U.S.'s concerns.

Russia is blamed for seeking the break-up of NATO and a re-ordering of 'European and Middle East security and economic structures in its favour'. China is identified for the first time as a strategic competitor seeking regional hegemony in the Indo-Pacific region in the near-term and 'displacement of the U.S. to achieve global pre-eminence in the future.

The U.S.'s 2018 Nuclear Posture Review (NPR) reflects a harsher assessment of the security environment faced by the U.S. and envisages a more expansive role for nuclear weapons than in the past. Russia is blamed for seeking the break-up of NATO and a re-ordering of 'European and Middle East security and economic structures in its favour'. China is identified for the first time as a strategic competitor seeking regional hegemony in the Indo-Pacific region in the near-term and 'displacement

of the U.S. to achieve global pre-eminence in the future'. A 30-year modernisation plan with a price tag of $1.2 trillion with new nuclear-armed SLCMs and low-yield warheads is detailed in the NPR. Russia has unveiled plans to develop a new nuclear torpedo and nuclear-powered cruise missile. Even more worrisome are developments that blur the line between nuclear and conventional weapons. In order to lessen its dependence on nuclear weapons, the U.S. developed layered missile defences and conventional Prompt Global Strike (PGS) capabilities that use conventional payloads against strategic targets. Other countries have responded with hypersonics and a shift to lower yield tactical warheads. With growing dependence on space-based and cyber systems, such asymmetric approaches only increase the risks of accidental and inadvertent nuclear escalation.

The next casualty is likely to be the New START agreement between the U.S. and Russia, which will lapse in 2021, unless renewed for a five-year period. This limits both countries to 700 deployed ICBMs, SLBMs and heavy bombers and 1,550 warheads each.

Preserving the Nuclear Taboo: The key difference with today's return of major power rivalry is that it is no longer a bi-polar world, and nuclear arms control is no longer governed by a single binary equation. There are multiple nuclear equations — U.S.-Russia, U.S.-China, U.S.-North Korea, India-Pakistan, India-China, but none is standalone. Therefore, neither nuclear stability nor strategic stability in today's world can be ensured by the U.S. and Russia alone and this requires us to think afresh.

The INF Treaty is not the first casualty of unravelling nuclear arms control. In December 2001, the U.S. unilaterally withdrew from the 1972 ABM Treaty with the U.S.S.R. which limited deployment of ABM systems thereby ensuring mutual vulnerability, a key ingredient of deterrence stability in the bipolar era. The next casualty is likely to be the New START agreement between the U.S. and Russia, which will lapse in 2021, unless renewed for a five-year period. This limits both countries to 700 deployed ICBMs, SLBMs and heavy bombers and 1,550 warheads each. However, Mr. Trump has described it as "one of several bad deals negotiated by the Obama administration". The lapse of the New START would mark the first time since 1968 that the U.S. and Russian nuclear arsenals would be unconstrained by any agreement.

North Korea's nuclear weapons threaten the global security order and our multilateral system, and Iran's nuclear activities could form a potential threat. Implementation of arms control treaties is being challenged as well. The way these problems are resolved will have an impact that is felt far into the future.

The political disconnect is also evident in the NPT, the most successful example of multilateral arms control. It has become a victim of its success. It can neither accommodate the four countries outside it (India, Israel, North Korea and Pakistan) as all four possess nuclear weapons, nor can it register any progress on nuclear disarmament. It succeeded in delegitimising nuclear proliferation but not nuclear weapons. This is why NPT Review Conferences have become increasingly contentious. The most important achievement of nuclear arms control is that the taboo against use of nuclear weapons has held since 1945. Preserving the taboo is critical but this needs realisation that existing nuclear arms control has to be brought into line with today's political realities.

Source: https://www.thehindu.com, 06 November 2018.

OPINION – Jacek Czaputowicz, Stef Blok

Nuclear Weapons: Old Dilemmas, New Dangers

Nuclear weapons have posed a challenge to international security since 1945. Today that challenge looms as large as ever. The Intermediate-Range Nuclear Forces Treaty has been under severe threat for many years and even more so today. North Korea's nuclear weapons threaten the global security order and our multilateral system, and Iran's nuclear activities could form a potential threat. Implementation of

arms control treaties is being challenged as well. The way these problems are resolved will have an impact that is felt far into the future. Moreover, tensions between major powers, pockets of instability on almost every continent, and revisionists challenging the rules-based international order are making the world less stable and predictable.

The emergence of military technologies such as autonomous weapons systems based on artificial intelligence, hypersonic weapons, and weaponised cyber and information technologies can severely disrupt communication lines, limit political discretion and shorten reaction times. In a nuclear crisis this is a potentially fatal combination. These developments call for an immediate return to effective nuclear arms control.

The NPT regime is an example of a true and highly successful form of multilateralism that benefits everyone, rather than a zero-sum approach. But now that the NPT is facing multiple challenges, we must all show a sense of ownership and responsibility if we want to hold on to the possibility of further nuclear arms control. We need ambitious and sensible new agreements on how to curb the nuclear threat.

Luckily, a solid basis for that already exists. That basis is the NPT, which has kept the number of countries with nuclear weapons below the level envisaged in the apocalyptic predictions of the 1960s. The Treaty also binds us to a clear goal of the complete elimination of nuclear weapons, and it has already helped achieve tangible nuclear disarmament. No less important, it has fostered international cooperation in the peaceful use of nuclear energy for economic development and prosperity, helping to widen the availability of effective medical treatments worldwide. The NPT regime is an example of a true and highly successful form of multilateralism that benefits everyone, rather than a zero-sum approach. But now that the NPT is facing multiple challenges, we must all show a sense of ownership and responsibility if we want to hold on to the possibility of further nuclear arms control. We need ambitious and sensible new agreements on how to curb the nuclear threat.

Opportunity: The 2020 NPT Review Conference, marking the 50th anniversary of the NPT's entry into force, is our chance. With this anniversary nearing, the Netherlands and Poland are pledging to work together to strengthen and develop the nuclear arms control regime so that it is equal to current and future challenges. Having chaired consecutive meetings of the NPT, we have been exploring new forms of cooperation, with an emphasis on responsibility and inclusiveness based on consultations in all parts of the world. We will continue this effort together with this year's NPT chair, Malaysia, and the future president of the Review Conference. The 2020 Review Conference must be a shared success. For this to happen, we must build bridges where differences persist and take bold steps where we see opportunities for deeper and wider cooperation. Only this way we can live up to our common obligations. There is cause for encouragement in the recent initiatives for the development of technologies, mechanisms and procedures for the verification of nuclear disarmament agreements.

Following the Russian proverb "trust but verify", which former US President Reagan was fond of quoting, the hard work of diplomats and technicians alike will help lay the foundations for the further reductions of nuclear arsenals. We see a need to improve transparency, dialogue and communication between nuclear states and their allies. This will foster strategic stability and minimise nuclear risks. All of us have a stake in preventing the use of nuclear weapons. This has always been acknowledged by those possessing these weapons, and this recognition has led to ground-breaking Cold War agreements and practices aimed at reducing tensions and preventing misunderstandings in times of crisis.

Stability: We should learn from our predecessors and adapt these ideas to the world of today.

Greater stability may in turn contribute to creating circumstances conducive to further progress on disarmament. We call on all parties to join us in working towards a positive outcome in 2020. Former US President John F Kennedy once expressed his fear that 20 or 25 countries might one day develop nuclear weapons. The NPT has prevented that. But this nightmare can still become a reality if we do not remain vigilant. Nuclear weapons are an unfinished story, and it is incumbent on us to compose a positive outcome for it.

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Source: https://euobserver.com, 31 October 2018.

OPINION – Lauren J. Borja, MV Ramana

The Argument from Cyberspace for Eliminating Nuclear Weapons

At the height of the Cold War in 1982, American psychiatrist Robert Jay Lifton argued that the "central existential fact of the nuclear age is vulnerability." That warning predated the proliferation of computers into almost every aspect of modern life, including nuclear weapons. Today, the destructiveness of nuclear weapons has been coupled with the vulnerability of computers to create new pathways to disaster. Specifically, there is now the possibility that hackers could compromise the computers that control nuclear weapons or provide information to officials about impending nuclear attacks.

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Weapons Security Critically Flawed: An October 2018 report reinforced this sense of vulnerability. In it, the U.S. Government Accountability Office (GAO) described a number of problems commonly found in the modern weapons systems developed by the U.S. Department of Defense (DOD). Although the report itself doesn't say so, officials confirmed that nuclear weapons programs were included in the study.

The findings of the GAO report echoed earlier warnings of the cyberthreat to nuclear weapons. These included a 2013 DOD report and one by the Nuclear Threat Initiative, a non-governmental nuclear weapon threat reduction organization based in Washington, D.C. Our research examines the risks associated with nuclear weapons systems, including those of accidental or inadvertent nuclear war. The most pressing concern from the GAO report is the possibility that some of these vulnerabilities might affect "nuclear command and control," the term used to describe the computer networks that continuously monitor and direct the vast U.S. nuclear arsenal (or Russia).

The recent GAO report broadly criticized all DOD weapons systems. Over the past five years (2012 to 2017), the GAO reported, "DOD testers routinely found mission-critical cyber-vulnerabilities in nearly all weapon systems that were under development. Using relatively simple tools and techniques, testers were able to take control of these systems and largely operate undetected." In other words, just about every weapon system being developed by the U.S. military is vulnerable to cyberattack. What stands out are both the scale of the problem and that these problems exist in systems that should be highly protected.

The Computerized Military: Computers play an

outsized role in the U.S. military — from providing information through various sensors to forming the backbone of communications networks. Faster communications and increased access to information are both valuable assets and these goals can be achieved with computers. Computers have become ubiquitous in the military environment as countries demand quick access to information and communications. But computers also introduce vulnerabilities. As their role grows to include connecting the weapons systems of most advanced countries, so does our vulnerability. The vulnerability of these weapons systems should be seen as an anticipated and, arguably unavoidable, consequence of the computer-filled world we live in.

We have observed a similar overconfidence in the military officials responsible for nuclear command and control. This is a problem because the command-and-control system relies on complex networks of interconnected computers. These computers connect early warning satellites and radars to the president and will be used to pass on presidential orders to launch nuclear weapons should that fateful decision ever be made.

The GAO report went farther than just identifying vulnerabilities — it identified a culture within the DOD that fails to recognize and adequately address cybersecurity problems. Officials routinely assumed their systems were safe and ignored warnings until very recently. We have observed a similar overconfidence in the military officials responsible for nuclear command and control. This is a problem because the command-and-control system relies on complex networks of interconnected computers. These computers connect early warning satellites and radars to the president and will be used to pass on presidential orders to launch nuclear weapons should that fateful decision ever be made.

Problems within the computers of nuclear command and control date back to at least the 1970s, when a deficient computer chip signalled that 200 Soviet missiles were headed towards the U.S. Computer problems have persisted: In 2010, a loose circuit card caused a U.S. launch control centre to lose contact with 50 nuclear missiles.

Computers must also constantly monitor and coordinate the daily operation of U.S. nuclear arsenal. Timelines for decisions in this system are extremely compressed, allowing less than 10 minutes for critical launch decisions to be made. The combination of interactive complexity and the tight timeline is typical of many other technological systems that are susceptible to unpredictable, large-scale accidents.

Computer Errors that Almost Started Nuclear Wars: Unclassified reports reveal that problems within the computers of nuclear command and control date back to at least the 1970s, when a deficient computer chip signalled that 200 Soviet missiles were headed towards the U.S. Computer problems have persisted: In 2010, a loose circuit card caused a U.S. launch control centre to lose contact with 50 nuclear missiles. In both cases, the accident might have been mistaken for a deliberate attack. Failing to recognize the mistake could have resulted in the U.S. launching nuclear weapons. These cases were presumably the result of unintentional errors, not deliberate actions. But hacking and other forms of targeted cyberattacks greatly increase the risk of accidental nuclear launch or other devastating actions. Overconfidence on the part of the officials overseeing the nuclear arsenal is therefore negligent and dangerous.

A more recent compounding factor is the ongoing, roughly trillion-dollar upgrade of the U.S. nuclear arsenal started by the Obama administration. This so-called modernization effort included upgrades to the nuclear command and control system. The Trump administration continues to make this

a priority. Modernization increases the possibility that changes to the nuclear command and control system will introduce new or reveal hitherto unknown vulnerabilities into the system. The evidence from the GAO report and other publicly available documents indicates that the officials in charge will be emphasizing speed, convenience, or cost over cybersecurity.

In its conclusion, the GAO report explained that the DOD "has taken several major steps to improve weapon systems cybersecurity." But the DOD "faces barriers that may limit its ability to achieve desired improvements," such as constraints on information sharing and workforce shortages. That is not reassuring. There is a more basic problem that we have emphasized above: the risks associated with cyberattacks can be ameliorated but not fully eliminated. When this intrinsic risk is integrated with the sheer destructiveness of nuclear weapons, the only way to avoid a catastrophic accident at some point in time is to embrace efforts to abolish the weapons themselves.

Source: https://theconversation. com, 08 November 2018.

OPINION – Nathan Myhrvold

Why We Need Innovative Nuclear Power

In 2006, Bill Gates and I took a hard look together at all the options humanity has for powering the 21st century. At that time, 81 percent of the world's primary energy—the raw form, before it is converted to electricity, gasoline, etc.—came from fossil fuels. Back then, you might recall, oil prices were soaring. Many analysts were actually quite worried about "peak oil" and coming shortages if growing demand outran shrinking supplies.

It was already obvious in 2006 that the world is not going to halt global warming, ocean acidification and air pollution just by conserving energy. Roughly a billion and a half people were then living without electricity—but they certainly wanted and needed it. World population was growing. In much of the world, people were living longer and better. They were buying more cars and using more home heating and air conditioning. All of this was set to continue, and all of it would demand more energy. Solar and wind power and biofuels were growing fast, and that was great. But I could already see major limitations looming ahead: the huge amounts of land needed, the lack of scalable ways to match their inconstant power to society's unremitting thirst for energy. Anyway, plenty of good minds were already working on improving those kinds of renewable energy. But there seemed to be a huge opportunity to rethink nuclear power. Most of the reactors operating around the world—including the ones at Fukushima and almost all of the 100 or so plants operating in the U.S.—were built from designs drafted during the slide-rule era and adapted from reactors used on aircraft carriers and submarines.

There seemed to be a huge opportunity to rethink nuclear power. Most of the reactors operating around the world—including the ones at Fukushima and almost all of the 100 or so plants operating in the U.S.—were built from designs drafted during the slide-rule era and adapted from reactors used on aircraft carriers and submarines.

Researchers in academia and at national labs had explored lots of promising alternative approaches. They had published—in some cases even prototyped—improved designs that don't rely on high-pressure steam or water for cooling, that use uranium far more efficiently and that make power more cheaply. Nuclear engineers could now exploit tremendous computing power to simulate novel designs and identify the best ideas without having to actually build test reactors. Yet the nuclear industry had largely lost its spirit of innovation. Utilities were exploiting new technology to make existing reactors more reliable than ever. But generations had passed with hardly any qualitatively new kinds of reactors making it to market. I couldn't help but wonder: what would happen if we put state-of-the-art computing in the

hands of some of the world's best nuclear physicists and then gave them a high bar to clear and a short deadline to do it? Could they invent a new kind of nuclear power plant where safety would be guaranteed by the basic laws of physics? One that would generate much less waste—or better yet, burn existing waste? A plant that slashes operating costs and avoids worries about nuclear proliferation? Just imagine how that could change the world. It seemed worth a shot. So with the backing of Bill and a few other bold investors, we launched TerraPower and dove in to the hard work of trying to make this real. Now here we are, 12 years later, in 2018. What's changed?

Since 2006, the biggest breakthrough in energy technology was not the one we were looking for. It's called fracking, and it has made natural gas cheap and kept oil affordable, while wreaking havoc on electricity markets to the detriment of cleaner alternatives.

On the bright side, TerraPower and a number of other nuclear start-ups have thrived and are well on their way toward building first-of-a-kind reactors. A 2015 report by Third Way, a think tank, identified nearly 50 companies and organizations working on advanced reactor projects. This momentum has drawn a large influx of young engineering talent into the field. But we need to accelerate the pace of progress. Since 2006, the biggest breakthrough in energy technology was not the one we were looking for. It's called fracking, and it has made natural gas cheap and kept oil affordable, while wreaking havoc on electricity markets to the detriment of cleaner alternatives. Meanwhile, global warming lurches ahead. Greenhouse gas emissions continue to grow. So do solar and wind power. But do you know how much of the world's primary energy comes from fossil fuels today? It's 81 percent—the same as in 2006. Humanity's appetite for fossil fuels has grown—not shrunk—despite all the new solar and wind farms and all the new LED bulbs and hybrid cars, because we just keep using more energy every year. The amount of energy consumed by an average person in China (averaged over the year) has jumped by a quarter since 2006, to three kilowatts (kW). That's six times as much as the energy use of an average African, which is a mere 0.5 kW. But it's still less than a third as much as the American average, which at 9.2 kW is equivalent to nine toasters, running 24/7.

Here's why it's so crucial that we develop better nuclear that we can all live with: before this century is out, there's good reason to believe that we'll see almost everyone in the world consuming energy at least as fast as Americans do now. That includes the 1.1 billion people who lack electricity altogether today. In many ways this would be the realization of a shared dream, because energy is the fulcrum that gives leverage to human ingenuity. Universal access to energy is arguably the most essential ingredient to ensuring that every child can live a healthy life of dignity and realize his or her human potential. Some people argue that it would be disastrous for the currently poor parts of the world to ramp up their energy use. I find that argument morally reprehensible. Who are we to say that our lifestyle is fine for us but not for others?

Humanity's energy challenge is far larger than most people understand. Raising the global average energy use from 2.4 kW, where it stood in 2017, to the current U.S. level of 9.2 kW per capita means nearly quadrupling energy production. And if all that new energy isn't made with near-zero carbon emissions, the climate will be a wreck.

Morality aside, the economic development of countries like China, India, Brazil, Indonesia and South Africa is unstoppable in the long run. History shows that societies organize themselves and their institutions to keep standards of living rising, and this drives energy consumption inexorably upward over the long term. If I'm right, then humanity's energy challenge is far larger than most people understand. Raising the global average energy use from 2.4 kW, where it stood in 2017, to the current U.S. level of 9.2 kW per capita means nearly quadrupling energy production. And if all that new energy isn't made

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The challenge is probably even greater than this. Humanity is now around 7.5 billion people. The U.N. Population Division forecasts that our species will number 10 to 13 billion by century's end. Ten billion of us using energy at current U.S. rates works out to a fivefold increase in global energy production over what we make today. Ironically, one of the strongest factors in reducing population growth rates is prosperity, which is highly correlated with energy use. Of course, the current U.S. average of 9.2 kW isn't carved in stone either. As we continue to innovate, some technological advances boost the energy efficiency of existing devices. But there are limits to those improvements. And innovation also creates new uses for energy. As you read this, for example, millions of computers are humming along in vast data farms built by Facebook, Amazon, Google, and Microsoft just waiting for you or someone else to access them over the internet. A generation ago, nobody would have forecast server centres as major energy users. But today Google consumes as much energy as all of San Francisco, and energy consumption by data centres in Virginia is huge and growing at 18 percent a year. If that fivefold increase in global energy use—or even a fraction of it—materializes, it won't be possible to meet the demand and avoiding trashing the atmosphere without taking full advantage of nuclear energy. But we would be foolish to rely on the nuclear technology of the slide-rule era. No other industrial sector would do that.

This why it is imperative that we turbocharge the pace of innovation in nuclear power. TerraPower is just one of dozens of start-ups around the world that are now exploring new and better kinds of reactors: big ones, tiny ones, some that float and some that operate underground. Several of these innovative designs could burn existing nuclear waste and the by-products of uranium enrichment. It's too early to say which ideas will succeed. I hope all of them do. But it is clear that the need is global, and the market for winning technologies will be huge. Governments and investors would be smart to place many bets. We need to increase the odds that at least one will pay off wildly—and soon.

Source: https://blogs.scientificamerican.com, 07 November 2018.

OPINION – Joseph Gerson

Trump Moves the World One Step Closer to Nuclear Catastrophe

In October, President Trump announced he plans to withdraw the U.S. from the INF Treaty, carving out a path to a 21st century US-Russian Cold War. The move demonstrates once again that ignorance compounded with the need for domination makes for an extremely dangerous nuclear cocktail of renewed arms racing that endangers human survival.

With enough political will, any problems of compliance with the existing treaties could be resolved" and, "There will be no winner in a 'war of all against all' – particularly if it ends in a nuclear war." One need not love Russian President Vladimir Putin to acknowledge the importance of Russia's Foreign Ministry saying, "There is still room for dialogue.

While the Russian military may indeed be in technical violation of the Treaty by testing a new medium-range cruise missile, less well known is the fact that a joint commission is currently exploring whether the US has also violated the Treaty with its own deployment of a missile defense system in Romania. Of course, the answer to Russia's cruise-missile testing should not have been to rip up the famous treaty that ended the Cold War. Rather, it should have prompted intensifying nuclear disarmament diplomacy. Former Russian leader Mikhail Gorbachev had it right when he remarked that Trump's announcement was not the work "of a great mind." As Gorbachev wrote in *The New York Times*, "With enough political will, any problems of compliance with the existing treaties could be resolved" and, "There will be no winner in a 'war of all against all' – particularly if it ends in a nuclear war." One need not love Russian President Vladimir Putin to acknowledge the importance of

Russia's Foreign Ministry saying, "There is still room for dialogue.

The INF Treaty came into force in 1987, bringing the Cold War to an end even before the Berlin Wall was breached and the Soviet empire collapsed. The Treaty requires elimination and permanent renunciation of future deployment of all US and Russian nuclear and conventional ground-launched cruise and ballistic missiles with ranges of 300 to 3,500 miles. It greatly reduced (but did not eliminate) the danger of Europe becoming the initial theatre and victim of a US-Soviet (now Russian) apocalyptic nuclear war.

Abandoning the Treaty — combined with the possible expiration of the New START Treaty if it is not soon extended — will eliminate all nuclear arms agreements between the world's two largest and most dangerous nuclear powers, paving the way for an unrestrained and mind-bogglingly costly nuclear arms race. The danger posed by nuclear weapons and the arms race are not abstractions. Both great powers already use their nuclear arsenals dangerously to reinforce or expand their imperial spheres of influence. For example, the US threatened possible nuclear attacks on the eves of the 1991 and 2003 Iraq wars, with former President Obama's "all options on the table" threats against Iran and President Trump's "fire and fury" threat against North Korea. Further, Putin stated that he considered the use of nuclear weapons to ensure Russian control of Crimea. Trump's nuclear arms racing only adds to the dangers of nuclear war as a result of miscalculations and accidents.

The decision to abandon the Treaty is part-and-parcel of Trump's unilateralist "America First" vision of US global dominance. Beyond ostensible concerns about possible Russian cruise-missile testing, Trump and company have complained that the INF Treaty restricts the Pentagon's ability to offset China's military modernization. Thus, withdrawal from the Treaty needs to be seen along with the Navy's provocative South China Sea "freedom of navigation exercises" and the disastrous trade war as another element of Trump's nationally self-defeating campaign to weaken and contain China – not to mention Trump's and National Security Adviser John Bolton's disregard for treaties and international cooperation.

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While withdrawal from the INF Treaty is a dangerous escalation on its own terms, it comes in the context of more than two decades of increasingly aggressive US military policies in relation to Russia: The NATO's expansion to Russia's borders, which was initiated during the Clinton administration; withdrawal from the ABM Treaty by the Bush II-Cheney administration; the Obama administration's commitment to spend $1.2 trillion (expanded to $1.7 trillion under Trump) to develop a new generation of US nuclear weapons and their delivery systems, deployment of missile defenses which Moscow fears could be converted into nuclear-armed first strike missiles; and the decision to deploy upgraded and "more usable" US nuclear weapons to five European NATO nations.

Committed to the doctrine of mutually assured destruction, President Putin reiterated Russia's commitment to maintain the balance of forces with the U.S. Russian nuclear-capable missiles have now been deployed to Kaliningrad in the heart of Central Europe. Further, in order to evade or overwhelm US missile defenses, Russia is deploying a new long-range multiple warhead missile, hypersonic cruise and other missiles capable of flying up to five times the speed of sound, and has pledged to deploy a nuclear-

powered "unmanned underwater vehicle" capable of destroying port cities with nuclear weapons.

We risk losing everything if we fail to add nuclear disarmament and peace to our list of progressive, life-affirming and democratic demands as we confront the Trump administration. Our list of demands should include preservation and reinforcement of the INF Treaty, opposition to what has become the $1.7 trillion US nuclear weapons upgrade, support for the Markey-Lieu legislation that would prevent presidential first-use of nuclear weapons, and renewed commitments to fulfilling the NPT obligation to "good faith" negotiations by the nuclear powers for the elimination of their nuclear arsenals. The last thing the world needs is a new Cold War that threatens human survival.

Source: https://truthout.org, 04 November 2018.

NUCLEAR STRATEGY

INDIA

Nuclear Submarine Arihant Completes First Deterrence Patrol Mission

Prime Minister Narendra Modi on 05 November, 2018 said that India's first nuclear armed submarine INS Arihant had successfully completed its first deterrence patrol, heralding India's entry into an exclusive club of powers with land, air and sea-based nuclear weapons delivery platforms. At the moment it is dubbed a technology demonstrator, showing the world that India has acquired this technology but that it will take some time before India gets a deployable fleet of such submarines. However, analysts said the 6,000-tonne vessel with a range of about 750 km sends a powerful signal to Pakistan and China that New Delhi's underwater nuclear deterrence is "credible", potent and functional. This comes against the backdrop of news reports of Chinese submarines repeatedly making their presence felt in the Indian Ocean region, even as India-China ties stabilize.

The 6,000-tonne vessel with a range of about 750 km sends a powerful signal to Pakistan and China that New Delhi's underwater nuclear deterrence is "credible", potent and functional. This comes against the backdrop of news reports of Chinese submarines repeatedly making their presence felt in the Indian Ocean region, even as India-China ties stabilize.

The Arihant propels India into a club so far dominated by the US, France, Britain, China and Russia, demonstrating India's technological capability to design, build and operate nuclear-powered ballistic missile submarines or SSBNs. The US leads the pack with more than 70 nuclear submarines and is followed by Russia with about 30. Britain and France have 10-12 submarines each. A ballistic missile submarine is a strategic asset as it can fire missiles from anywhere in the ocean and remain undetected for long. It can creep along the coast of an enemy nation and fire ballistic missiles deep into their territory, which cannot be reached by land-based short-range ballistic missiles. China has commissioned four Type 094 SSBNs with a Type 094A estimated to be under construction, according to reports. Pakistan only has attack submarines but there are plans to arm them with nuclear missiles, according to various reports.

"Air and land-based nuclear weapons and their delivery platforms are easier to track down than a weapon that is hidden and moving at sea. It is, therefore, a strategic asset," said a person familiar with the development. "India's 'No first use' nuclear policy mandates the setting up of a triad of air, sea and land deterrence capabilities," said Abhijit Singh, a former naval office now with the New Delhi-based think tank, Observer Research Foundation. "Policymakers and strategic experts appear convinced that the sea-based leg is the most survivable component," he said.

In comments posted on Twitter, Modi said the Arihant feat was "historic because it marks the completing of the successful establishment of the nuclear triad. India's nuclear triad will be an important pillar of global peace and stability", underlining India's "No first use" policy and the role of the sea-based strategic platform as a

guarantor of peace. "In an era such as this, a credible nuclear deterrence is the need of the hour. The success of INS Arihant gives a fitting response to those who indulge in nuclear blackmail," Modi said in a second Twitter post.

"India is a land of peace," Modi said. "Peace is our strength, not our weakness. Our nuclear programme must be seen with regard to India's efforts to further world peace and stability," he said. India's hunt for a nuclear submarine began in the 1970s but it was only in the 1990s that it launched the Advanced Technology Vessel programme, under which the Arihant came into being, to build submarines capable of launching nuclear weapons.

Source: https://www.livemint.com, 06 November 2018.

RUSSIA

Russia to Arm an 'INVINCIBLE' Nuclear Weapon by 2019 Says Putin

RUSSIA is finalising a nuclear weapon capable of wiping out an entire city by descending on Earth "like a meteorite" at 20 times the speed of sound, Vladimir Putin has claimed, sparking World War 3 fears.

RUSSIA is finalising a nuclear weapon capable of wiping out an entire city by descending on Earth "like a meteorite" at 20 times the speed of sound, Vladimir Putin has claimed, sparking World War 3 fears.

Tensions between Washington and Moscow reached a new high as the Russian President claimed he has a weapon that can resist any anti-missile systems, making it almost invincible. Mr Putin said: "We know for certain, it's an obvious fact and our colleagues realise it, that we surpassed all our competitors in this area. "Nobody has precise hypersonic weapons. Some plan to test theirs in 18 to 24 months. We have them in service already." And blaming the need of a second nuclear race after the Cold War on the US, which has an advanced ballistic missile defence, he added: "Responding to the development of anti-ballistic missile systems by the US, we are improving our strike capabilities. "Some are already in service, others will be deployed soon." Called Avangard, the weapon will go into active service by next year with the Red Banner Missile Division, based in the Urals, according to a Russian defence industry source.

Speaking to Russian news agency TASS, they said: "The scheduled period for placing the lead regiment on combat duty is the end of 2019. "Initially, the regiment will comprise at least two systems but eventually their number will rise to their organic quantity of six units." According to the claims made by Russia, the Avangard is a hypersonic glide vehicle, a spacecraft which is lofted into the atmosphere atop an intercontinental ballistic missile, such as the Satan II, to then glide down at hypersonic speed. Being 20 times faster than the speed of sound means the Avangard could travel as fast as at 6860 m/s.

Japan and the US have mobilised 57,000 sailors, marines and airmen for the biennial Keen Sword exercise, 11,000 more than in 2016, with simulated air combat, amphibious landings and ballistic missile defence drills. Japan's contingent of 47,000 personnel represents a fifth of the nation's armed forces.

Source: https://www.express.co.uk, 09 November 2018.

USA–JAPAN

US Carrier Leads Warships in Biggest Ever Japan Defence War Game

US fighter jets darted over the Western Pacific on 3 November 2018 as the nuclear powered USS Ronald Reagan aircraft carrier joined Japanese destroyers and a Canadian warship for the biggest combat readiness war game ever staged in and around Japan. Japan and the US have mobilised 57,000 sailors, marines and airmen for the biennial Keen Sword exercise, 11,000 more than in 2016, with simulated air combat, amphibious landings and ballistic missile defence drills.

Japan's contingent of 47,000 personnel represents a fifth of the nation's armed forces. "We are here to stabilise, and preserve our capability should it be needed. Exercises like Keen Sword are exactly the kind of thing we need to do."

Rear Admiral Karl Thomas, the commander of the carrier strike group, said during a press briefing in the Reagan's focsle as F-18 fighter jets catapulted off the flight deck above him. Eight other ships joined the carrier for anti-submarine warfare drills in a show of force in waters that Washington and Tokyo fear will increasingly come under Beijing's influence. "The US-Japan alliance is essential for stability in this region and the wider Indo Pacific," Rear Admiral Hiroshi Egawa, the commander of the Japanese ships said aboard the Reagan Based in Yokosuka near Tokyo, it is the biggest US warship in Asia, with a crew of 5,000 sailors and around 90 F-18 Super Hornets fighters.

Japan, however, still views China as a potentially much larger and more challenging foe than Pyongyang as its expanding navy consolidates control of the South China Sea and ventures deeper into the Western Pacific and Indian Ocean. Beijing, in 2018, plans to spend 1.11 trillion yuan ($160 billion) on its armed forces, more than three times as much as Japan and about a third of what the US pays for a military that helps defend the Japanese islands.

Canada Joins: A Canadian naval supply ship is also taking part in Keen Sword along with the frigate that sailed with the Reagan on 3 November 2018. Canadian participation is taking a bilateral drill which began in 1986 "into the realm of multilateral exercises," Canada's defence attache in Japan, Captain Hugues Canuel said in Tokyo. Participation in Keen Sword, he added, reflects Canada's desire to have a military presence in Asia.

Canada isn't the only western nation looking to take a bigger security role in the region. Britain and France are also sending more ships as China's military presence in the South China Sea grows and its influence over the Indo Pacific and its key trade routes expands. British, French, Australian and South Korean observers will also monitor Keen Sword, which began on 5th November and ends on 8 November 2018.

***Bolder Japan*:** Growing foreign interest in Asian security, including North Korea's development of nuclear weapons and ballistic missiles, coincides with greater Japanese willingness to back up its regional diplomacy with a show of military muscle. Tokyo in 2018 sent its biggest warship, the Kaga helicopter carrier, on a two-month tour of the Indo Pacific, including flag-waving stops in the Philippines, Indonesia, Sri Lanka, India and Singapore.

The 248 metre (813.65 ft) long Maritime Self Defence Force ship and its two destroyer escorts also conducted drills with a Japanese submarine in the contested South China Sea. At the same time, Japanese PM Shinzo Abe has engaged China in dialogue to reduce tension between their militaries in the East China Sea and to increase economic cooperation between Asia's two leading economies. Amid a background of trade friction with Washington, Abe travelled to Beijing in October 2018, the first such trip by a Japanese leader in seven years, for talks with President Xi Jinping and Premier Li Keqiang. Abe told them that China and Japan shared responsibility for regional security, including tackling North Korean.

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Source: https://cyprus-mail.com, 03 November 2018.

USA–RUSSIA–CHINA

Trump, Putin, and Xi Ponder Nuclear Strategy

On 20 October 2018, the President announced our withdrawal from the INF Treaty after the required six-month warning period. That move could either spell the beginning of an arms race or a sea change in global security. The INF Treaty banned for the first time an entire category of nuclear-armed weapons. Such weapons destabilized the nuclear balance when they were installed in Europe in the mid-1970's, but through negotiation, the U.S. and USSR agreed to destroy almost 2,700 missiles and launchers.

By recently appointing arms control skeptic John Bolton as National Security Adviser, the President set the stage either for an arms race that could bankrupt Russia (and maybe us, too) or dramatic new approaches that could redefine how the global strategic balance is managed.

Unfortunately, since Reagan's day, technology and the rise of China undermined INF. New weapons not covered by the Treaty and China's emergence as the number two global power in all but nuclear weapons – diminished the treaty's relevance.

European reaction reflects the growing gaps among the U.S., the E.U. and the U.K. The British have come out in support of the President's decision, saying Moscow has "made a mockery" of the INF agreement and "Russia needs to respect the treaty obligation that it signed." But while E.U. and some German leaders expressed alarm at a return to Cold War confrontations, some welcomed the demise of INF and hope the U.S. will build up its nuclear arsenal in Europe to counter Russia's assertiveness.

President Trump came into office promising to get the U.S. out of "unfair" agreements, including INF, and to increase our nuclear capabilities. By recently appointing arms control skeptic John Bolton as National Security Adviser, the President set the stage either for an arms race that could bankrupt Russia (and maybe us, too) or dramatic new approaches that could redefine how the global strategic balance is managed. Given the President's penchant for drama and his self-image as a great negotiator, don't bet on the arms race just yet.

Last December, the President announced a strategy to compel Russia back into compliance with INF: diplomacy, sanctions and developing new U.S. weapons beyond INF limitations. When Moscow responded with counter-charges of U.S. violations, on October 20, the President announced at a rally, "Russia has violated the (INF) agreement…and we're not going to let them violate a nuclear agreement…"

But our deal-maker President left the door open for negotiations, saying "We'll have to develop those weapons, unless Russia comes to us and China comes to us and they all …say, 'let's really get smart and let's none of us develop those weapons'…" Mr. Trump added, "(An arms race is) a threat to whoever…China…Russia and…anybody else that wants to play that game..."

Later, in Moscow, National Security Advisor John Bolton received a surprisingly muted reception. In his lengthy meeting with Bolton, Putin warned that it is "very dangerous" to dismantle a global arms control system and added, "There would be nothing left except an arms race," and that Russia's response would be "very quick and effective." Further, Putin also left the negotiations door open, saying that new Russian missiles would be deployed only in response to the arrival of U.S. missiles in Europe. Bolton's Russian counterpart added that the Kremlin was "ready to work with the U.S. to remove mutual grievances" over the INF.

Since the President's announcement, European reaction reflects the growing gaps among the U.S., the E.U. and the U.K. The British have come out in support of the President's decision, saying Moscow

has "made a mockery" of the INF agreement and "Russia needs to respect the treaty obligation that it signed." But while E.U. and some German leaders expressed alarm at a return to Cold War confrontations, some welcomed the demise of INF and hope the U.S. will build up its nuclear arsenal in Europe to counter Russia's assertiveness in Ukraine and elsewhere.

The net result of all this posturing preceding the President's November 11 meeting with Putin leaves open the chance for a strategy to dispense with the INF problem. We could agree to use the six-month withdrawal hiatus to preserve the treaty by negotiating a compromise over both sides' complaints — ours about Russia's missiles and Russia's about our "Aegis Ashore" missile defenses in Romania that they see as an INF violation. The sides could thereby rescue INF or, consistent with Bolton's preference for "arms control without agreements," they could opt for ignoring each other's violations yet continue honoring some INF constraints voluntarily, making the treaty irrelevant.

I predict the INF Treaty will die and, sadly, arms control as a process might die too. At stake for both Russia and the U.S. are not only the INF limitations, but also the future of the New START that comes up for renewal in 2021. While President Trump has also characterized New START as "a bad deal," it's renewal would retain limits that both sides have viewed as sufficient.

But the President's frequent references to China suggest he has more on his mind. China was not affected by INF limits and has built up a significant arsenal of INF-type missiles that allow China to challenge U.S. and allied forces in the Pacific and in South Korea. How the President might play "the China card" with Putin is unclear. The U.S. shares Russia's concerns about a rising China and may be looking for a common approach in restraining Beijing's ambitions. But Russia and China have their own cards to play and may prefer to align together against the U.S.

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If New START also dies, we might begin a costly and senseless new arms race. Indeed, with Russia already invested in new missiles and U.S. manufacturers and the Pentagon eager to jump in, an arms race that no one wants seems likely.

Or will the President use his warm relationship with Putin to apply further pressure on China? Xi Jinping does not want the U.S. and Russia to move closer together at China's expense. Could the President's suggest a three-way discussion about a new approach to limiting offensive weapons – one based on unilateral self-restraint and transparency – (the John Bolton approach), rather than negotiated agreements? Or is that giving the present Administration too much credit for strategic thinking? What happens in the next six months will tell us more.

Source: Jack Segal, https://www.northernexpress. com, 10 November 2018.

BALLISTIC MISSILE DEFENCE

CHINA

China Promotes New CM-401 Supersonic Ballistic Anti-Ship Missile

Chinese defense company offers its new CM-401 supersonic ballistic anti-ship missile for the export market. China's modern indigenously designed and manufactured supersonic ballistic anti-ship missile will make its maiden public appearance during the Air Show China 2018 exhibition, which is set to take place in Zhuhai from 6–11 November.

The CM-401 missile is a new type of hight supersonic ballistic anti-ship missile, using near space trajectory, and capable of all-course high

supersonic manoeuvrable flight, terminal diving and high-velocity top-attacking, various platform launching firing. It is mainly used to rapidly and exactly attack medium-large sized vessels and ships, formations and port targets. According to company's officials, it has the characteristics of multi-ballistic coordinated capability, powerful damage capability, strong penetration ability and system combat. The new CM-401 missile has an estimated top speed of Mach 6 and a maximum range of 290 km.

Source: https://defence-blog.com, 05 November 2018.

USA–ROMANIA

US Army to Supply Additional Patriot Missile Defence Systems to Romania

The US Army has agreed to deliver three additional Patriot integrated air and missile defence systems to the Armed Forces of Romania. With the agreement, the US Government is expected to start contract negotiations with Raytheon. All Raytheon-built Patriot fire units being delivered to the Romanian Armed Forces will be newly built. Raytheon Romania country manager Mike Ellison said: "Romania is purchasing the most advanced, capable, cutting-edge tactical ballistic missile defence system in the world. "Patriot has been tested thousands of times in peace and repeatedly proven itself in combat.

The current deal will support the Romanian Air Force's plan to procure four fire units, in addition to bolstering the Romanian Armed Forces' intention to purchase seven of the air and missile defence systems. A total of 15 other nations have acquired the defence system, including the US, Germany, Greece, the Netherlands, Spain, Poland, and Sweden.

Simply put, Patriot saves lives." "This will enhance Romania's ability to train with the US Army and other NATO allies. "The missile defence system comprises radars, command-and-control technology and multiple types of interceptors, all integrated together to detect, identify and defeat missiles, drones, advanced aircraft and other threats. Raytheon Romania Patriot programme manager Michelle DeMaio said: "Romania's Patriot fire units will have the same hardware and software suite as the US Army's Patriot fire units. The current deal will support the Romanian Air Force's plan to procure four fire units, in addition to bolstering the Romanian Armed Forces' intention to purchase seven of the air and missile defence systems. A total of 15 other nations have acquired the defence system, including the US, Germany, Greece, the Netherlands, Spain, Poland, and Sweden.

Source: https://www.army-technology.com, 05 November 2018.

NUCLEAR ENERGY

CHINA

Second AP1000 Enters Commercial Operation

Unit 1 of the Haiyang nuclear power plant in China's Shandong province has completed 168 hours of full-power continuous operation. The unit is now deemed to be the second AP1000 reactor to enter commercial operation. Haiyang 1 completed the full-power demonstration test run on 22nd October, State Power Investment Corporation announced. The reactor, it said, has now met "commercial operation conditions". Although operator China National Nuclear Corporation must still obtain necessary permits and documentation, the unit can now be considered to be in commercial operation.

In September 2007, Westinghouse and its partner the Shaw Group received authorisation to construct four AP1000 units in China: two at Sanmen in Zhejiang province and two more at Haiyang in Shandong province. Construction of Sanmen 1 began in April 2009, while first concrete for Sanmen 2 was poured in December 2009. Construction of Haiyang 1 and 2 began in September 2009 and June 2010, respectively. Unit 1 of the Haiyang plant attained first criticality on

8 August and was grid connected on 17 August. On 21 September, Sanmen 1 became the first AP1000 to enter commercial operation. Unit 2 of the Sanmen plant is also expected to enter commercial operation by the end of this year, while Haiyang 2 is expected to start up early in 2019.

Source: http://www.world-nuclear-news.org, 23 October 2018.

Work Begins on China's First Floating Nuclear Power Plant: What could Go Wrong?

It's the dawn of a brave new world in China with construction work beginning on the country's first floating nuclear power plant. The 14 billion yuan ($2 billion) plant is being built in the coastal Shandong city of Yantai under the direction of the China National Nuclear Corporation, according to a report from the local *Qilu Evening News*.

While details about the project are few at the moment, an announcement in 2017 about the plant said that it would boast a 400-megawatt reactor, capable of providing clean energy to 200,000 households. The plant may be used to power coastal cities, islands, offshore platforms, or remote areas. It's expected to be ready for operation in 2021. As part of its 13th Five Year Plan, laying down the strategy for the country's development from 2016 to 2020, China had said that its first floating power plant would be ready to go by 2020. A short time later, it announced plans to construct a fleet of 20 nuclear power plants to provide power to its artificial islands in the South China Sea, raising both environmental and global security concerns. Since then, little had been said about China's nuclear sea power ambitions. In the meantime, in April 2018, Russia launched the world's first floating nuclear plant, the 70-megawatt *Akademik Lomonosov*. The plant, which will be used to provide power for the Arctic town of Pevek, has been called "Chernobyl on ice" and a "nuclear Titanic" by Greenpeace.

It would boast a 400-megawatt reactor, capable of providing clean energy to 200,000 households. The plant may be used to power coastal cities, islands, offshore platforms, or remote areas. It's expected to be ready for operation in 2021. As part of its 13th Five Year Plan, laying down the strategy for the country's development from 2016 to 2020, China had said that its first floating power plant would be ready to go by 2020.

Source: https://shanghai.ist, 05 November 2018.

INDIA

India Must Expand Global Partnerships to Meet Nuclear Energy Target: WNA Head

India needs to expand international partnerships to expedite the development of its nuclear plants and meet the target of 63 GWe nuclear power capacity by 2032, the head of the WNA said on 31st October, 2018. The world average for building a nuclear plant is five to six years but India takes a longer period than that, WNA Director General Agneta Rising said. However, India is running its nuclear plants at 80 per cent of the installed capacity, matching the world average, Rising told PTI at the five-day Singapore International Energy Week which began on 29 October 2018.

The Narendra Modi government has set an ambitious 63 GWe nuclear power capacity addition target by the year 2031-32. "Capacity-wise India has not built so much. India has to pick-up and build more and expand nuclear energy," she said. Though India is in partnership with Russia to develop its nuclear plants, the country must expand its international partnerships, Rising said. India and Russia have signed contracts for priority design works and supply of main equipment for units 5 and 6 of the Kudankulam nuclear power plant in Tamil Nadu. Three main contracts were signed between state-owned and NPCIL Russia's JSC Atomstroyexport for priority design works, working design and supply of the main equipment for stage III of Kudankulam NPP.

The NPCIL has also signed an agreement with

France's EDF to build six EPRs. Rising also said, "Every country in the world need a direction and policy support to nuclear energy development.... If a government lends policy support and set direction, you will get financing, training and easily find good people." … Early implementation of the 63 GWe target should make nuclear a significant low-carbon part of India's total energy requirements, he pointed out. India has seven reactors with a combined capacity of 4.8 GWe under construction. The reactors include the country's indigenously designed 700 MWe units. India has also approved construction of 10 indigenous nuclear reactors with a total capacity of about 7,000 MWe, the WNA noted in a press release. …

Source: https://www.business-standard.com, 31 October 2018.

NETHERLANDS

Majority in Dutch Parliament Supports Building More Nuclear Plants

A majority in the Tweede Kamer, the lower house of Dutch parliament, supports a proposal by ruling party VVD to build more nuclear power plants in the Netherlands. Opponents worry about nuclear waste and what it will mean for future generations, NOS reports. The VVD proposal was supported by the VVD, PVV, CDA and FvD. Proponents believe that the Netherlands cannot afford to outright reject nuclear energy. But they also point out the disadvantages - nuclear waste, the construction of a nuclear plant is a long process, and it is an expensive source of energy.

The SGP and SP are not for or against the proposal. The SGP is not happy about the topic, but believes that it needs to be discussed. The SP is not against nuclear energy, but will wait for serious proposals, the party said. For opponents GroenLinks and ChristenUnie, the nuclear waste problem is insurmountable. They do not want to saddle future generations with this problem. The PvdA, also an opponent, points out that wind and solar energy are also expensive, but at least they are more sustainable.

Over the past few years energy companies had the opportunity to apply for a permit and build a nuclear plant, but so far no one seemed to be interested, according to NOS. German energy company RWE, which is involved in the Netherlands' only nuclear power plant in Borssele, confirmed to the broadcaster that it won't apply for such a permit. "The risks are too great", a spokesperson said. "The investment is 6 to 10 billion euros. You do not know what the electricity price is going to do. And you don't know how social support will develop." Essent is also not interested.

The question now is whether the Dutch politicians can agree on nuclear energy, and make building a plant more attractive to energy companies. According to the Netherlands Environmental Assessment Agency, this will not succeed without the support of the government. Tellingly, two of the coalition parties - D66 and ChristenUnie - did not support the proposal. …

Source: https://nltimes.nl, 07 November 2018.

RUSSIA

First Reactor Started on Russia's Floating Nuclear Plant

Russia's floating nuclear power plant, long a controversial dream of the country's atomic energy industry, has finally become an actual nuclear power plant after its first reactor achieved a sustained chain reaction at its mooring in Murmansk harbour in November, 2018. The news came in a release to RIA Novosti, a semi-official Russian newswire, which on 2 November 2018 quoted an unnamed official with Rosatom, Russia's state nuclear energy enterprise. "The physical launch of the reactor unit on the starboard side of the floating power plant Akademik Lomonosov occurred on 2 November," the official was quoted as saying. "The reactor unit reached the minimum controlled power level at 17:58 Moscow time."

A series of reactor tests will now follow, according to the official, and the second reactor on the port side of the nuclear barge will be brought to minimum power in the coming days. After the reactor tests, the *Akademik Lomonosov* will be

towed through the Arctic to the far eastern Siberian port of Pevek, a town of 100,000 people in Chukotka, were it is slated to go online in the summer of 2019. The plant is expected to replace the energy supplied by the Bilibino nuclear power plant – the world's four northernmost commercial reactors – which Rosatom will begin decommissioning in 2021.

For 12 years Russia has been pursuing its audacious experiment in floating nuclear power, fording a river of doubt, economic downturns and environmental outcry – and confounding critics who said the plant was an expensive publicity stunt that was doomed to failure. Despite dodging such predictions, the plant remains as improbable as ever – a huge, ungainly nuclear solution in search of a problem. Since its rocky – and often secretive – beginnings in the early 2006, Russia has attempted to sell the plant as a cure-all for energy woes in the world's more remote regions. And while the plant has spawned a number of imitation plans in other coutries, it has failed to draw the windfall of orders Rosatom said would justify its $480 million cost. Rosatom officials themselves have conceded that this price tag is too high to bring the floating plant, as designed now, into serial production. Yet the corporation has done much in recent months to draw back the veils of mystery it draped over the plant through much of its construction. The apprehensive eyes of the world's media were upon the plant last April when it was finally towed into the open ocean from St Petersburg's Baltic Shipyard en route to Murmansk.

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In October, Rosatom invited Bellona to be the first foreign environmental group to inspect the *Akademik Lomonosov* at its moorings at Atomflot, Russia's Murmansk-based nuclear icebreaker port. Still, the new openness has done little to settle Bellona's central concerns about Rosatom's long-range intentions for its floating nuclear power plant. By design, the plant is meant to operate in remote regions. But this very remoteness, Bellona has said, would vastly complicate the rescue operations that would be necessary after an accident, as well as the more routine clearing of spent nuclear fuel from its reactors.

Likewise, visions of Fukushima's waterlogged reactors have not faded from public memory, and the thought of a nuclear power plant as vulnerable to tsunamis and foul weather as is the ocean-based *Akademik Lomonosov* strikes an anxious chord among environmentalists.

Rosatom has often said the plant is invulnerable to tsunamis and cites the fact that its water-borne location will give it access to infinite supplies of reactor coolant in the event of an accident. But environmentalists are skeptical. In the worst-case scenario, the plant might not ride out the waves, but instead be torn from its moorings to barrel inland through buildings and towns until it lands, battered and breached, with two active nuclear reactors on board – well away from its source of emergency coolant.

Rosatom's best option in that disaster scene would be the 24-hour's worth of backup coolant located aboard the barge, which is hardly reassuring. Still, the whole idea of a floating nuclear plant has piqued curiosity – and competition. Two state-backed companies in China are said to be pursing plans for at least 20 floating nuclear plants, and American scientists have drawn up blueprints of their own. The company estimates each floating plant will take four years to build, compared with a decade or so for standard land-based nuclear plants. The Sudan Tribune has cited that country's minister of water resources and electricity as saying the government in Khartoum has a deal to become the first foreign floating plant customer.

Source: https://www.maritime-executive.com, 05 November 2018.

SAUDI ARABIA

Saudi Arabia Prepares to Build First Nuclear Research Reactor

Saudi Crown Prince Mohammed bin Salman on 5 November 2018 laid the foundation stone for the kingdom's first nuclear research reactor, state media said, as the kingdom seeks to diversify its energy mix. The reactor was among seven projects launched by the prince during a visit to Riyadh's King Abdulaziz City for Science and Technology, the official Saudi Press Agency reported. SPA offered no details on when the research or non-power reactor — typically used for research, development and education purposes — would be built and at what cost. Saudi Arabia currently draws on oil and natural gas to meet its own fast-growing power demand and desalinate its water.

The world's top crude exporter harbors plans to build 16 nuclear reactors over the next two decades for $80 billion as it seeks to diversify, despite concerns over nuclear proliferation in the Middle East. Prince Mohammed said in March that if Iran develops a nuclear weapon, Riyadh will do so too.

The world's top crude exporter harbors plans to build 16 nuclear reactors over the next two decades for $80 billion as it seeks to diversify, despite concerns over nuclear proliferation in the Middle East. Prince Mohammed said in March that if Iran develops a nuclear weapon, Riyadh will do so too. In an interview with CBS television, he likened regional rival Iran's supreme leader to Hitler, saying he "wants to create his own project in the Middle East." Riyadh held deep reservations over the 2015 accord aimed at curbing Iran's nuclear ambitions and hailed US President Donald Trump's announcement in May that the U.S. was withdrawing from the deal.

Trump reportedly refused a March request by Prime Minister Benjamin Netanyahu for a commitment to halting an emerging deal to sell further nuclear reactors to Saudi Arabia, telling the prime minister that if the US did not supply the reactors, then the Russians or Chinese would. Netanyahu and his team reportedly requested that, if the Americans insist on going ahead with building reactors, Saudi Arabia be prevented from enriching uranium by itself. The announcement comes as the US vowed to be "relentless" in countering Iran as sweeping new sanctions took effect.

Source: https://www.timesofisrael.com, 06 November 2018.

TAIWAN

Taiwanese to have Say on Nuclear Phase-out Policy

A referendum on the Taiwanese government's policy to phase out the use of nuclear energy by 2025 is to be held alongside local elections next month, Taiwan's Central Election Commission (CEC) has announced after initially rejecting the proposal. Taiwan has four operable nuclear power reactors - two each at the Kuosheng and Maanshan plants - which account for around 15% of the island's electricity generation. Construction of two units at Lungmen began in 1999, but the project has been beset with political, legal and regulatory delays. The completed unit 1 was mothballed in July 2015, while construction of unit 2 was suspended in April 2014.

A referendum on the Taiwanese government's policy to phase out the use of nuclear energy by 2025 is to be held alongside local elections next month, Taiwan's Central Election Commission (CEC) has announced after initially rejecting the proposal.

Taiwan's Democratic Progressive Party (DPP) was elected to government in January 2016 having a policy of creating a "nuclear-free homeland" by 2025. Shortly after taking office, the DPP government passed an amendment to the Electricity Act, passing its phase-out policy into law. The referendum proposal asks voters whether they agree with abolishing Paragraph 1 of Article 95 of the Electricity Act, which stipulates that "all nuclear energy-based power-generating facilities

shall completely cease operations by 2025". The call for a referendum on the government's phase-out policy was led by pro-nuclear and pro-democracy activist Shih-Hsiu Huang, co-founder of Nuclear Myth-Busters.

Under Taiwanese law, petitioners must deliver an initial 2000 signatures before gaining permission to spend six months gathering more signatures. The pro-nuclear activists reportedly submitted the initial signatures in March, but did not get permission until July to gather further signatures. In August, former Taiwanese president Ma Ying-jeou endorsed the referendum and joined pro-nuclear environmentalists in gathering signatures on the streets of Taipei. Organisers said they delivered 315,000 signatures to the CEC on 6 September - more than the required 282,000 for a referendum. An additional 24,000 signatures were delivered on 13 September, which the CEC rejected after the deadline for submitting them was brought forward.

The decision represents a major blow to the government's ambitions for new nuclear and leaves a huge hole in energy policy. The plant would have provided about 7% of UK electricity. … After a board meeting of Toshiba, the company said it was winding up NuGeneration because of its inability to find a buyer and the ongoing costs it was incurring.

In protest to the CEC's rejection of the signatures, Huang began a hunger strike the same day. However, after 140 hours without food, he was rushed to hospital on 19 September with high blood pressure and a fast heartbeat. Two fellow activists continued the hunger strike on Huang's behalf. Ten renowned scientists, conservationists, energy experts and pro-democracy advocates wrote to President Tsai Ing-wen on 19 September to "express their concern" over the government-run CEC's handling of the proposed referendum. "We urge you and the CEC to accept all signatures delivered before the official deadline of 14 September, and to treat the petitioners fairly," they said in a joint letter. "Whether you support or oppose nuclear energy, it is vital that the people of Taiwan be able to deliberate and decide on this matter themselves."

The CEC said on 12 October 2018 that the petitioners had fallen short of the legal threshold to launch a referendum by 2326 signatures. However, on 17 October 2018 the Taipei High Administrative Court ordered the commission to accept the additional signatures submitted on 13 September 2018. The CEC announced on 23rd October that, taking these additional signatures into account, the petitioners had sufficient signatures to include the referendum in local elections on 24 November 2018.

Huang said if the proposed referendum is passed the clause in the Electricity Act will be removed three days after the commission announces the voting results, the *Taipei Times* reported. He also said another referendum proposal may also be submitted to resume work on two reactors at Lungmen if the government refuses to change its nuclear power policy.

Source: http://www.world-nuclear-news.org, 24 October 2018.

UK

UK Nuclear Power Station Plans Scrapped as Toshiba Pulls Out

Plans for a new nuclear power station in Cumbria have been scrapped after the Japanese conglomerate Toshiba announced it was winding up the UK unit behind the project. Toshiba said it would take a 18.8bn Japanese yen (£125m) hit from closing its NuGeneration subsidiary, which had already been cut to a skeleton staff, after it failed to find a buyer for the scheme.

The decision represents a major blow to the government's ambitions for new nuclear and leaves a huge hole in energy policy. The plant would have provided about 7% of UK electricity. … After a board meeting of Toshiba, the company said it was winding up NuGeneration because of its inability to find a buyer and the ongoing costs it was incurring. The firm has already spent more than £400m on the project. "Toshiba recognises that the economically rational decision is to withdraw from the UK nuclear power plant construction project, and has resolved to take steps to wind-up NuGen," the firm said in a

statement.

The plant first ran into trouble when Toshiba's US nuclear unit, Westinghouse, was declared bankrupt last year, leading it to search for a buyer to take the scheme. Toshiba also said it would no longer take forward new nuclear projects overseas. South Korean energy firm Kepco initially appeared to ride to the rescue, but despite talks with the UK government it later rowed back due to a change of leadership at Kepco and new approach to financing nuclear power in the UK.

Some industry watchers said the collapse of the scheme should be seen as an opportunity rather than a risk, for the UK to prioritise renewables instead. … The government's infrastructure advisers recently urged ministers to rethink their nuclear plans and focus on renewables instead.

Source: https://www.theguardian.com, 08 November 2018.

NUCLEAR COOPERATION

SOUTH KOREA–RUSSIA

S. Korea, Russia Expand Nuclear Decommissioning Technology

South Korea and Russia have agreed to boost technology cooperation on safety and decommissioning of nuclear reactors, Seoul's nuclear institute said on 7 November 2018. The consensus was reached in a meeting between the Korea Energy Economics Institute and Russian uranium exporter Tenex, which is controlled by Russia's State Atomic Energy Corp. Rosatom, in Moscow on 6th November. "We will make efforts to fuse Russia's expertise and South Korea's technology," Director Ha Jae-joo said. Currently, South Korea operates 24 nuclear reactors that generate 27 percent of its total power.

Source: http://english.yonhapnews.co.kr, 07 November 2018.

UK–CANADA

UK and Canada Sign Agreement for Civil Nuclear Cooperation

THE UK and Canada have signed a bilateral Nuclear Cooperation Agreement (NCA) which will ensure that international cooperation will still apply after the UK leaves the EU. When the UK leaves the EU in March 2019, it will also exit the European Atomic Energy Community (Euratom) agreement which governs the peaceful use of nuclear energy. The agreement with Canada, which was signed on 2 November, is the third to be made in 2018, with agreements already made with Australia and the US. The agreements allow the UK to continue mutually beneficial civil nuclear cooperation when the Euratom arrangements cease to apply in the UK.

The UK has now secured all replacement international agreements necessary prior to the Euratom exit. The three NCAs must be ratified by parliament to ensure that they can come into effect at the end of March 2019 in the case of a no-deal Brexit. In addition to the international agreements, the Nuclear Safeguards Act 2018 has been created to ensure domestic nuclear safeguards remain in place after Brexit. Richard Harrington, business and industry minister, said: "This latest international agreement will help ensure our civil nuclear trade with Canada can continue seamlessly, providing certainty for our world-leading nuclear sector which provides one fifth of all our electricity. These preparations have been recognised as gold standard."

Chris Heaton-Harris, parliamentary under-secretary of state at the Department for Exiting the European Union, said: "Signing this nuclear cooperation agreement with Canada is a major step in our preparations for leaving the EU and comes after we recently signed bilateral NCAs with the United States and Australia, and concluded nuclear safeguards agreements with the IAEA. Together, these deals increase the global nuclear industry's confidence that there will be no disruption to the UK's international civil nuclear arrangements – and reflect the extensive work taking place across government to ensure the country continues to operate smoothly from the day we leave the EU."

Source: https://www.thechemicalengineer.com, 05 November 2018.

UZBEKISTAN–RUSSIA

Uzbekistan and Russia Launched Nuclear Power Station Construction Project

A solemn event dedicated to launching the construction project of the First Nuclear Power Station in Uzbekistan was held at Uzexpocentre. The President of the Republic of Uzbekistan Shavkat Mirziyoyev and the President of the Russian Federation Vladimir Putin pressed a symbolic button to launch the project. Specialists of Uzatom Agency and Rosatom State Corporation announced the start of engineering surveys to select sites for construction of the first NPS in Uzbekistan, via videoconference.

As a result of launching nuclear power station, the economy of significant volumes of natural gas will be achieved. Carbon dioxide emissions will be reduced to 14 million tons and nitrogen oxides by 36 thousand tons.

"Today we are opening a new strategic direction of cooperation with the Russian Federation – development of nuclear energy. This project forms a new cluster, its implementation will serve to further development of industrial potential and creation of new jobs in different sectors of the country's economy", said the President of Uzbekistan.

In accordance with the Decree of the President of the Republic of Uzbekistan, the Atomic Energy Development Agency under the Cabinet of Ministers has been established for peaceful use of nuclear energy. An agreement on construction of Nuclear Power Station in Uzbekistan has been reached with Rosatom Corporation, which ranks the first place in the world in terms of number and scale of foreign projects – construction of 34 power units in 12 countries. NPS will consist of two WWER-1200 generations "3+" units with a capacity of 1,200 MW each, which are the most modern and safe.

... As a result of launching nuclear power station, the economy of significant volumes of natural gas will be achieved. Carbon dioxide emissions will be reduced to 14 million tons and nitrogen oxides by 36 thousand tons. Uzbekistan, in accordance with its international obligations as a member state of the IAEA, focuses on nuclear safety. All international requirements for construction of the nuclear power station will be strictly enforced in implementing the project. IAEA experts supported Uzbekistan's initiative on implementation of the National program on using nuclear energy for peaceful purposes and expressed readiness to provide all possible assistance in its implementation.

In accordance with agreements reached earlier, it was decided to open a branch of the National Research Nuclear University "Moscow Engineering Physics Institute" in Tashkent. In the next academic year, the branch of MEPhI will receive first students. Rosatom Corporation has already organized training 30 Uzbekistan's students in this world-famous University this academic year, in Moscow. Uzbekistan's students, having studied at MEPhI, will become highly qualified specialists, will become able to ensure safe operation of Nuclear Power Station. The atom will indeed be peaceful in their safe hands.

Source: http://www.uzbekembassy.in, 19 October 2018.

URANIUM PRODUCTION

KAZAKHSTAN

Kazakh Uranium Giant Poised to List Shares in London

National Atomic Co. Kazatomprom JSC, the world's largest uranium producer, has secured investor support to list 15% of its shares in London in November, sources have told the *Financial Times* of London. The Kazakh company is aiming to raise up to US$600 million in the listing, which would value the uranium producer at US$4 billion.

One industry official said the planned listing could give a boost to uranium prices, which have gained about 30% since April 2018, to trade at around US$28 a pound, but are still a long way from

US$72.63, the level reached before the 2011 Fukushima disaster in Japan, a pivotal event that triggered a lengthy bear market in the uranium sector. Mark Chalmers, the President and CEO of Colorado-based **Energy Fuels Inc.** [EFR-TSX] recently told the Cambridge House International Silver Summit in San Francisco that Kazatomprom has focused on increasing market share in recent years. But now that the company is going public, it will want the IPO to be underpinned by a higher uranium price. That could force it to reduce its production ahead of the IPO, Chalmers said. However, he said it's possible that the IPO could be delayed. Meanwhile, published reports say Japan's domestic nuclear industry will miss a government target of providing at least one-fifth of the country's electricity by 2030.

Energy Fuels and Ur-Energy petitioned for the investigation amid concerns that domestic producers in the U.S. are projected to fulfil about 2% of total U.S. commercial demand in 2018. In 2017, imports of uranium from state-owned and state-subsidized enterprises in Russia, Kazakhstan and Uzbekistan fulfilled about one third of U.S. demand, while purchases of U.S. uranium by owners of U.S. nuclear reactors dropped by 46%.

However, the sector is showing signs of life more than seven years after the Fukushima crisis, according to a Reuters report. With eight reactors running and one more set to come online this month, nuclear has this year overtaken non-hydro renewables in power output for the first time since the 2011 catastrophe, when all of the country's nuclear plants were idled. Reuters News service said Japan's nuclear regulator has approved an operations extension for a 40-year-old reactor near Tokyo that was damaged in the same earthquake and Tsunami that sparked the Fukushima disaster. The move is expected to be controversial. That's because the reactor has the same basic design as those that melted down in the Fukushima crisis. It will be the first boiling water reactor to be approved for a lifetime extension of 20 years. Meanwhile, industry officials in the U.S. are awaiting the outcome of a U.S. Department of Commerce investigation into the effects of uranium imports on U.S. national security. The investigation was launched on July 18, 2018 at the request of Energy Fuels and another U.S. company **Ur-Energy Co.** [URE-TSX].

Energy Fuels and Ur-Energy petitioned for the investigation amid concerns that domestic producers in the U.S. are projected to fulfil about 2% of total U.S. commercial demand in 2018. In 2017, imports of uranium from state-owned and state-subsidized enterprises in Russia, Kazakhstan and Uzbekistan fulfilled about one third of U.S. demand, while purchases of U.S. uranium by owners of U.S. nuclear reactors dropped by 46%. In the petition, the companies proposed two complementary remedies. They include a quota that limits imports of uranium into the U.S., effectively reserving 25% of the U.S. market for domestic uranium production, as well as a requirement for U.S. federal utilities and agencies to buy U.S. uranium in accordance with the President's Buy American Policy. The proposed remedies are expected to result in U.S. utilities purchasing approximately 12 million pounds of uranium per year from U.S. production.

Source: http://resourceworld.com, 08 November 2018.

NUCLEAR PROLIFERATION

IRAN

US Must Swiftly Revise Sanctions Pressure Policy Against Iran: Russia

Russia has "resolutely" condemned a recent "destructive" move by the U.S. to impose a new wave of sanctions on Iran, urging Washington to immediately review its policy of sanctions pressure against Tehran. "We reject any unilateral sanctions bypassing UNSC decisions, especially when they are applied extra-territorially and concern the interests of third countries, as is the case with US restrictions against Iran," the Ministry of Foreign Affairs of the Russian Federation said in a statement on 3 November

2018. "If Washington, as it claims, is indeed interested in negotiations with Tehran, the policy of sanctions pressure aimed at diminishing Iran's economic and defense potential as well as undermining the internal political situation there must be revised immediately," it added. By using pressure, it will be "impossible to reach concessions" with Iran, it noted.

The statement came after the US Treasury Department announced all sanctions on Iran lifted under the 2015 nuclear deal, officially known as the JCPOA, would be back in force on 5 November 2018. According to Treasury Secretary Steven Mnuchin, the sweeping sanctions will see 700 people blacklisted, including people who were granted relief under the JCPOA, as well as over 300 new names.

Speaking to reporters on 2 November 2018, Mnuchin said the Belgian-based SWIFT global payment network could be hit with American sanctions if it deals with Iranian financial institutions that Washington had blacklisted.

"SWIFT is no different than any other entity. We have advised SWIFT that it must disconnect any Iranian financial institutions that we designate as soon as technologically feasible to avoid sanctions exposure," he added.

The White House also said it was "the toughest sanctions regime ever imposed" on Tehran. It targets both Iran and states that trade with it. However, US Secretary of State Mike Pompeo said…that Washington would allow eight countries to continue importing Iranian oil but only at much lower levels after the re-imposition of sanctions. The Russian Foreign Ministry's statement further said the fresh anti-Iran sanctions were aimed at undermining the consistent efforts taken by parties to the JCPOA to preserve the agreement after the US withdrawal in May. It expressed "deep disappointment and increasing concern" over US attempts to demolish the international legal instruments of nuclear non-proliferation and arms control and warned of the "deteriorating" security situation in the world. "The United States has now dealt another powerful blow to the NPT, bringing it closer to collapse while hypocritically talking about the need to strengthen it," the statement read. It said the JCPOA had proved to be effective and the IAEA had regularly confirmed Iran's compliance with its obligations under the nuclear agreement. "The verification and control measures provided for in the Action Plan are applied in full. This in itself is reliable proof of the peaceful nature of the Iranian nuclear program," it added.

North Korea is still developing long-range nuclear missiles in hidden bases, according to shocking new satellite images. The communist state has around 16 hidden bases producing the devastating weapons, which have been identified in commercial satellite images. CSIS published the photographs as part of its Beyond Parallel programme.

IAEA Director General Yukiya Amano once again reaffirmed in September that Iran was in compliance with the nuclear agreement. "Iran is implementing its nuclear-related commitments under the JCPOA," Amano said. Elsewhere in the statement, the Russian Foreign Ministry urged the international community not to allow "such a significant achievement of international diplomacy to collapse at the whim of just one nation, which openly violates the norms of international law." It emphasized that parties to the JCPOA were absolutely capable of overcoming any emerging issues. "We will do everything necessary to preserve and expand international trade and economic and financial cooperation with Iran despite the US sanctions," the statement pointed out. Russian Energy Minister Alexander Novak also said…that his country would help Iran counter fresh US sanctions, saying Moscow would continue trading Tehran's crude in defiance of Washington. "We believe we should look for mechanisms that would allow us to continue developing cooperation with our partners, with Iran," Novak told the *Financial Times*.

Source: https://www.presstv.com, 03 November 2018.

North Korea Still Making Long-range Nuclear Weapons

North Korea is still developing long-range nuclear missiles in hidden bases, according to shocking new satellite images. The communist state has

around 16 hidden bases producing the devastating weapons, which have been identified in commercial satellite images. CSIS published the photographs as part of its Beyond Parallel programme. It comes after US President Donald Trump claimed to have neutralised the North Korean threat after his landmark diplomacy this year when he met Kim Jong-un.

Mr Trump said at a news conference: "We are in no rush. The sanctions are on. "The missiles have stopped. The rockets have stopped. The hostages are home." North Korea offered to dismantle a major launching site following talks with the US. But the promise appears to be an act of deception as Pyongyang continued to make improvements to more than a dozen other sites to bolster launches of conventional and nuclear warheads. The hermit kingdom has ceased its missile launches since 2016.

But US intelligence officials believe North Korea has continued its production of nuclear material, nuclear weapons and missiles that can be put on mobile launchers and hidden in the mountains in secret bases. Beyond Parallel is a programme focusing on the prospects of North-South integration. The leader of the team that studied the images, Victor Cha, said: "It's not like these bases have been frozen. Work is continuing. "What everybody is worried about is that Trump is going to accept a bad deal — they give us a single test site and dismantle a few other things, and in return they get a peace agreement that formally ends the Korean War. …

Source: https://www.dailystar.co.uk, 12 November 2018.

NUCLEAR NON-PROLIFERATION

PALESTINE

Palestinian Authority Signs Nuclear Safeguards Deal with UN Agency: Report

The Palestinian Authority (PA) signed a draft agreement with the IAEA in February 2018, essentially granting the agency access to the "territory of Palestine" to ensure safeguards are applied regarding nuclear materials, *Jerusalem Post* reported Wednesday.

"The Agency shall have the right and the obligation to ensure that safeguards will be applied, in accordance with the terms of this Agreement, on all source or special fissionable material in all peaceful nuclear activities within the territory of Palestine, under its jurisdiction or carried out under its control anywhere, for the exclusive purpose of verifying that such material is not diverted to nuclear weapons or other nuclear explosive devices," Article 2 of the agreement reads. The document has yet to be published, since it is classified as "restricted", the *Jerusalem Post* reported.

Israel monitors everything that enters the Palestinian territories, even restricting the entry of so-called dual use materials, which have both civil and military applications. Nevertheless there are labs and hospitals, as well as agrarian industry that incorporate components of nuclear materials and equipment. Yet, the decision by the PA to enter the agreement with the IAEA can be understood as a symbolic one, meant to raise hairs, and part of the PA's promise to join as many international treaties and organizations as possible in order to further its quest for statehood. In December, it was reported that the Palestinians intended to apply to join 22 international treaties, including 18 of the United Nations, in protest against the decision of US President Donald Trump, to recognize Jerusalem as the capital of Israel. They included the Chemical Weapons Convention; the Geneva Protocol; Convention against Torture and Cruel, Inhuman or Degrading Treatment or Punishment; the Convention on Nuclear Terrorism; the Convention on the Physical Protection of Nuclear Material; and others.

"Following its accession to the NPT in February 2015, Palestine informed the IAEA Secretariat that it wished to conclude a safeguards agreement with the Agency to fulfill its NPT obligations," the IAEA press office said in response to questions, the *Jerusalem Post* reported. "In light of that request, a draft safeguards agreement (with a "small quantities" protocol) was prepared for Palestine and submitted to the IAEA Board of

Governors."

Questions arise concerning how the IAEA might treat the "territory of Palestine"; whether it would establish its own regulatory body as required by a member state according to the "Safeguards Agreement", and whether Israel could seek to check IAEA officials seeking to entering the territories to perform the inspections. But in its response, the IAEA press office emphasized that the agreement has not yet taken effect and that it essentially does not present an opinion on sensitive legal issues that abound in the Israeli-Palestinian conflict. "However, the safeguards agreement has not entered into force yet. The submissions of the draft agreement to the Board of Governors or its implementation do not imply the expression of any opinion whatsoever concerning the legal status of any country or territory or of its authorities, or concerning the delimitation of its frontiers," the IAEA said.

Questions arise concerning how the IAEA might treat the "territory of Palestine"; whether it would establish its own regulatory body as required by a member state according to the "Safeguards Agreement", and whether Israel could seek to check IAEA officials seeking to entering the territories to perform the inspections. But in its response, the IAEA press office emphasized that the agreement has not yet taken effect and that it essentially does not present an opinion on sensitive legal issues that abound in the Israeli-Palestinian conflict.

Source: https://www.i24news.tv, 01 November 2018.

NUCLEAR DISARMAMENT

JAPAN –USA

Spat over NPT Reference in Japan-Sponsored U.N. Resolution

A clear policy difference emerged between Japan and the US when they had bilateral consultations before a U.N. panel adopted a Japanese resolution in November, calling for the total elimination of nuclear weapons, according to diplomatic sources. The U S had opposed including some sentences referring to the importance of Article 6 of the Nuclear Non-Proliferation Treaty and agreements reached at the review conferences on the NPT in 1995, 2000 and 2010 in the Japan-sponsored U.N. resolution, the sources who spoke on condition of anonymity recently told Kyodo News. The article, which was not mentioned in a similar U.N. resolution the previous year, calls on nuclear-armed states to pursue nuclear disarmament. The resolution, titled "United action with renewed determination toward the total elimination of nuclear weapons," was adopted by the First Committee on disarmament issues at the U.N. General Assembly on 1 November 2018. But Japan's key ally the US abstained, calling it a "step back" from last year's document, which it supported.

According to the sources, before the resolution was adopted by the committee, U.S. diplomats raised strong concerns about the draft that mentioned the article. Also, the U.S. diplomats expressed strong opposition to a paragraph in it that urged all countries to take steps agreed to in the final documents of the NPT conferences, according to the sources.

The US characterized the past agreements as "out of date" under the current security environment.... The final document agreed to in 2000, for example, said there should be an "unequivocal undertaking" by nuclear weapon states to accomplish the complete elimination of their nuclear arsenals. The U.S. diplomats' oppositions reflected the administration of President Trump's reluctance to embrace the obligation of nuclear disarmament under the NPT. The Trump administration also announced, in October, a decision to withdraw from the 1987 Intermediate Nuclear Forces Treaty, which helped end the Cold War.

The US also asked Japanese diplomats to delete a sentence urging North Korea to "sign and ratify the CTBT" from the draft resolution, because the

Trump administration has already decided not to pursue ratification of the treaty itself, according to the sources. The Japanese government deliberated the U.S. requests before concluding that it should reject them because Japan is the only country to have suffered the devastation of atomic bombings and cannot compromise on its fundamental principles to advocate nuclear disarmament. "It is a red line for us," a Japanese source said. However, the exposed policy difference indicates there may be difficulties between Japan and the US in cooperating on nuclear disarmament agendas, as the NPT regime will mark the 50th anniversary in 2020 of the treaty's entry into force.

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The U.N. resolution, penned by Tokyo, again omitted any reference to the Treaty on the Prohibition of Nuclear Weapons in view of its reliance on the U.S. nuclear umbrella. Taking these realities into consideration, for the past few years the administration of Prime Minister Shinzo Abe has said both at home and abroad that it will seek to play a constructive role as a "bridge-builder." But the ambivalent nature of Japan's anti-nuclear policy has drawn criticism from nuclear disarmament advocates. "Being a bridge-builder does not mean that Japan just takes the middle ground between nuclear weapon states and non-nuclear weapon states," Tatsujiro Suzuki, a Nagasaki University professor, said. "As a victim nation of nuclear bombs, Japan should keep a clear distance from the U.S. nuclear arming policy."

Tokyo has drafted and put forward a similar motion calling for the abolition of nuclear arms for the past 25 years, with the latest version endorsed by 160 countries, up 16 from last year. Four countries — China, North Korea, Russia and Syria — voted against it and 24, including the United States, abstained.

"A notion of 'humanitarian consequence,' as emphasized in the nuclear ban treaty, is the element Japan has advocated for a long time," said Suzuki, who is also director of the Research Center for Nuclear Weapons Abolition at the university. "Even though Japan is not able to sign it right now, it should declare it will pursue future admission to the treaty. After that, Japan could be trusted as a bridge-builder." Tokyo has drafted and put forward a similar motion calling for the abolition of nuclear arms for the past 25 years, with the latest version endorsed by 160 countries, up 16 from last year. Four countries — China, North Korea, Russia and Syria — voted against it and 24, including the United States, abstained.

Source: https://www. japantimes.co.jp, 10 November 2018.

NUCLEAR SAFETY

BELARUS, SLOVENIA

Belarus, Slovenia to Share Information on Nuclear Safety

The Belarusian Emergencies Ministry and the Slovenian Nuclear Safety Administration signed a memorandum of sharing information on nuclear and radiation safety, BelTA learned from the Nuclear and Radiation Safety Department at the Belarusian Emergencies Ministry (Gosatomnadzor). The areas of cooperation will include regulations in nuclear and radiation safety, nuclear energy use licenses, emergency preparedness and response, safe transportation, transit and relocation of radioactive materials and waste. The departments will also exchange information related to the legislative regulation in nuclear and radiation safety. The memorandum was concluded on the sidelines of the high-level plenary meeting of the Western European Nuclear Regulators Association (WENRA) in Schaffhausen (Switzerland). On behalf of Belarus the document

was signed by Gosatomnadzor head Olga Lugovskaya; on behalf of Slovenia by the chief of the Slovenian Nuclear Safety Administration Andrej Stritar.

Source: https://eng.belta.by, 08 November 2018.

NUCLEAR WASTE MANAGEMENT

FRANCE

France Eyes Building Nuclear Waste Disposal Site

A French government agency plans to apply late next year for a license to build a final disposal site for high-level radioactive waste from nuclear power plants.

A spokesperson for the French National Radioactive Waste Management Agency, or Andra, disclosed the plan in an interview with NHK on 7th November. Audrey Guillemenet said the agency will file the application with the country's nuclear safety authority in late 2019.

The IAEA and the International Association for Environmentally Safe Disposal of Radioactive Materials (EDRAM) have pledged to strengthen cooperation and coordination on the development of "safe, effective and secure solutions" for the disposal of high-level radioactive waste and used nuclear fuel.

Guillemenet said that if the storage is authorized, construction will start soon so the agency can begin trial operations around 2025.The planned site is in and around Bure, eastern France. The agency has done research for final disposal for about 15 years, using a tunnel as deep as 490 meters in Bure. Researchers examined the strata there and developed storage technologies. The agency still faces challenges, including cost-cutting and ensuring safety in managing flammable waste. Japan and other countries have had difficulty drawing up concrete plans for final disposal, including site selection.

Source: https://www3.nhk.or.jp, 08 November 2018.

GENERAL

International Organisations Bolster Cooperation on Waste

The IAEA and the International Association for Environmentally Safe Disposal of Radioactive Materials (EDRAM) have pledged to strengthen cooperation and coordination on the development of "safe, effective and secure solutions" for the disposal of high-level radioactive waste and used nuclear fuel.

IAEA officials including Deputy Director General Mikhail Chudakov, head of the Department of Nuclear Energy, and Deputy Director General Juan Carlos Lentijo, head of the Department of Nuclear Safety and Security, met with a delegation from EDRAM at the IAEA headquarters in Vienna in October, 2018. EDRAM promotes the exchange of knowledge, experience and information on the implementation of national high-level radioactive waste disposal programmes among its 12 members. Representatives from the national radioactive waste management organisations of Canada, Finland, France, Germany and Japan attended the meeting with the IAEA. The IAEA said the meeting provided an opportunity to discuss key issues related to implementing comprehensive national waste management strategies, including deep geological disposal for high-level waste and used nuclear fuel. …

The IAEA is collecting experiences and approaches of Member States in developing deep geological disposal programmes for retaining and transferring knowledge about them. To support this effort, the heads of the national organisations representing EDRAM at the meeting in Vienna offered to jointly develop strategic assessments of this IAEA project. Other IAEA activities also discussed at the meeting include a project on the development and review of safety cases for both the operational and post-closure periods for deep geological disposal. "We all need to continually exchange information on these matters between us and with international organisations, and understand very deeply the differences and commonalities among them, including from a technical and industrial point of view, in order to be able to explain them to our stakeholders," said EDRAM Chairman Shunsuke Kondo, head of Japan's Nuclear Waste Management Organisation.

Source: http://www.world-nuclear-news.org, 30 October 2018.

RUSSIA–NORWAY

Russia Offers to Help Safeguard Norwegian Radioactive Waste

After 25 years of economic aid from Norway to secure nuclear- and radioactive waste on the Kola Peninsula, the situation could be mirrored back. In November, newspaper *Aftenposten* (pay-wall) reported that Norway's repository for solid radioactive waste in Himdalen, an hour drive from Oslo, violates several norms stipulated in its operation license. The repository, supposed to be safe for hundreds of years, receives radioactive waste from Norway's two research reactors, from x-ray machines, and other sources used in medicine and industry. The repository opened in 1998. Now, spokesperson in the Ministry of Foreign Affairs, Maria Zakharova, says Russia is ready to assist Oslo in dealing with the inappropriate storage of radioactive waste….

"We have seen these reports, two major rules violations have been recorded," Zakharova says…."Given our long experience of cooperation in the field of radiation security, Russia is ready to provide assistance to our Norwegian colleagues in resolving issues with the radioactive waste storage system."

Since 1995, the Norwegian Ministry of Foreign Affairs has granted about 2 billion kroner (•190 million) to a long range of nuclear safety projects in Russia, mainly at the Kola Peninsula where Cold War nuclear powered submarines have been decommissioned. Also, Norway is still cooperating with Russia on securing the Andreeva Bay storage site where both radioactive waste and spent nuclear fuel are stored. The site is located some 60 kilometers from the border to Norway. Funding is granted to both safety projects at both Kola and Leningrad nuclear power plants. At Atomflot, Russia's base for civilian nuclear powered icebreakers, Norwegian funding has been spent on physical protection of vessels and for a cleaning facility for liquid radioactive waste. The last was never commissioned. …

Source: https://thebarentsobserver.com, 08 November 2018.

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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