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OPINION – Ramesh Thakur

Nuclear Arms: Look Ahead to 2018 in Hope, not Back at 2017 in Anger

We begin 2018 with a surreal contest between US President Trump and North Korea's Kim as to whose nuclear button is bigger. Against North Korea's anxiety-inducing rapid nuclear advances, the biggest positive story line of 2017 was a new UN nuclear ban treaty adopted on July 7 and opened for signature on September 20. It strengthens the norms of non-proliferation and those against nuclear testing, reaffirms the disarmament norm, rejects the nuclear deterrence norm and articulates a new universal norm against possession. Once in force, it will become part of the legal architecture for disarmament and all countries must adjust to this new institutional reality. It will reshape how the world community thinks about and acts in relation to nuclear weapons and those who possess the bomb....

It is, nonetheless, a good-faith effort by 122 countries to act on their responsibility under the Nuclear NPT to take effective measures on nuclear disarmament at an early date. To critics of nuclear deterrence, the nuclear powers are not so much possessor as possessed countries. Within the security paradigm, nuclear weapons are national assets for the possessor countries individually. In the ban treaty's

To critics of nuclear deterrence, the nuclear powers are not so much possessor as possessed countries. Within the security paradigm, nuclear weapons are national assets for the possessor countries individually. In the ban treaty's humanitarian reframing, they are a collective international hazard.

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humanitarian reframing, they are a collective international hazard. The step-by-step approach adopts a transactional strategy to move incrementally without disturbing the existing security order. The ban treaty's transformative approach transcends the limitations imposed by national and international security arguments. The known humanitarian consequence of any future use makes the very possibility of nuclear war unacceptable. Dispossession of nuclear weapons now would remove that future possibility.

The ban treaty is a circuit breaker in the search for a dependable, rules-based security order

outside the limits of what the nuclear-armed countries are prepared to accept. The nuclear powers have instrumentalized the NPT to legitimize their own indefinite possession of nuclear weapons while enforcing non-proliferation on anyone else pushing to join their exclusive club. For them, the problem is who has the bomb. But for anti-nuclear advocates, increasingly the bomb itself is the problem.

But significant domestic constituencies in several alliance members will continue to demand signature of the ban treaty and the only credible route to defusing their demands will be to demonstrate continued concrete progress on nuclear disarmament.

The ban treaty has created a new political reality that will require managing domestic demands and expectations, and national security calculations.... Hitherto, nuclear deterrence has been privileged absolutely over calls for disarmament. But significant domestic constituencies in several alliance members will continue to demand signature of the ban treaty and the only credible route to defusing their demands will be to demonstrate continued concrete progress on nuclear disarmament.

The International Campaign played the lead role in civil society to ICAN. Nuclear weapons are uniquely destructive and hence uniquely threatening to all our security. ICAN was established in the belief that there is a compelling need to challenge and overcome the reigning complacency toward nuclear risks and dangers, to sensitize policy communities to the urgency and gravity of the nuclear threats and the availability of non-nuclear alternatives as anchors of national and international security orders.

ICAN, launched in Melbourne in April 2007, was modelled on the International Campaign to Ban Landmines (ICBL), which had won the Nobel Peace Prize in recognition of its lead role in mobilizing civil society and like-minded governments. The transformation of anti-nuclear movements into coalitions of change requires a similar shift from

street protest to engagement with politics and policy.... It won the 2017 Nobel Peace Prize in recognition of its decade long “ground-breaking efforts to achieve a treaty-based prohibition” of nuclear weapons by drawing “attention to the catastrophic consequences of any use” of these weapons....

Source: <https://www.japantimes.co.jp>, 09

January 2018.

INTERVIEW – Sukesh Aghara

Nuclear Security Expert Assesses World Threats in 2018

In November, North Korea announced it had successfully launched a new type of ICBM capable of striking the entire US mainland. It was the country’s 23rd missile fired in 16 tests in 2017. Among the security experts worldwide keeping a close eye on this development is Assoc. Prof. Aghara, director of UMass Lowell’s Nuclear Engineering Program.... Here, Aghara shares his perspective on what we can expect to see in the geopolitical landscape in the coming year.

The US needs to continue to contain this development by engaging the UNSC, the IAEA, South Korea, China, Russia and other regional allies. There is also substantial global interest in the South China Sea, and US leadership is essential to maintain peace.

Q: What do you think will happen with North Korea in 2018?

A: North Korea will continue to develop its long-range ICBMs and

nuclear weapons program, and I do not see any change in this regard. The country’s maturity in these technologies has reached a point of no return under the current regime. The US needs to continue to contain this development by engaging the UNSC, the IAEA, South Korea, China, Russia and other regional allies. There is also substantial global interest in the South China Sea, and US leadership is essential to maintain peace.

Q: What about Iran? What’s next for the nuclear deal brokered by the Obama administration with

the UK, Russia, France, China and Germany?

A: The Iran nuclear deal has successfully put the country's uranium enrichment program and nuclear weapons development on ice. However, the deal does not eliminate Iran's nuclear capability as desired by many in the US, including the Trump administration. By refusing to certify the agreement in October and asking Congress to review it, the Trump administration is pushing US policymakers to debate the alternatives to the Iran deal. As it is, Iran has not breached any of the clauses of the current deal and hence, it is difficult for the administration to walk away from it. However, by taking this step, the issue is brought back into the forefront of discussion.

Q: In the South China Sea, there's ongoing dispute between China and Southeast Asian countries over territorial waters and sovereignty, and in the East China Sea, tension is increasing between China and Japan over maritime incursions. Both could have significant impacts on US national interests in the region and could quickly escalate into full-scale armed conflict. Are there other potential global flash points we should worry about in 2018?

A: Europe continues to develop into a dynamic region that will pull US interests into different directions. The departure of the UK from the European Union and a weak election outcome in Germany leaves a power vacuum in the region. The US has diverse history and national interests in the region that span all the way from the UK to Turkey. Our diplomacy and foreign policy are going to be tested in the coming year. ...

Q: Finally, is the world getting closer to a nuclear conflict?

A: It will take a crazy person to start a nuclear conflict in the 21st century. History has shown that using a nuclear weapon is not the true advantage, but rather possessing the technology, which provides strategic and tactical deterrence. It is unlikely that a state will make a conscious decision to use a nuclear weapon; however, the real danger is that if the control of that weapon gets outside of the regulator's direct command, it can pose a major problem.

Source: <https://www.uml.edu/News/stories/2018/Sukesh->

[QandA-2018.aspx](https://www.uml.edu/News/stories/2018/Sukesh-QandA-2018.aspx), 3 January 2018.

OPINION – Brian Hioe

Are China's Plans for 'Floating Nuclear Reactor' a Strange Form of Deterrence?

A bizarre idea proposed by China as of late has been that of building floating nuclear reactors around South China Seas islands which it is currently disputing territorially with Taiwan, Japan, the Philippines, Vietnam, and other regional powers. In truth, the idea is not as grandiose as it sounds. While artificial island building has been something that China has resorted to in order to territorial claims over these islands, most plans of these "floating nuclear reactors" would be closer to nuclear-powered vessels, rather than as large in scale as artificial islands....

But what China possibly intends is for such "floating nuclear reactors" in the South China Seas to serve as a nuclear deterrent to possible attacks on South China Seas Islands that it claims as its own. What is unique about this is that nuclear deterrent usually consists of a country warding off possible attack with the threat of attacking aggressors with

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nuclear countries. Countries do not typically use nuclear reactors as nuclear deterrents, in the sense that fear of causing a nuclear disaster is used as a shield to prevent attack.

It has to be remembered that nuclear-powered military vessels already do exist, as in nuclear submarines or nuclear-powered aircraft carriers operated by the US, and fear of nuclear disaster caused by destroying these vessels is usually not viewed as a deterrent in military strategic calculus. Yet nuclear submarines or nuclear-powered aircraft usually are not positioned in territories that are highly desired by a number of nation-state as a form of deterrent.

China's use of floating nuclear reactors, however, would be ironic in this light. A nuclear disaster would render South China Seas islands as dangerous inaccessible to China as to other countries also pursuing territorial claims over such islands. China's attitude, then, could be summarized as resembling a scorched earth strategy. If China cannot have these islands, then nobody should be allowed to have them. Like many other countries in the region, China has an active environmental and anti-nuclear movement. A radiation disaster in South China Seas islands, caused by China's attempts to use nuclear reactors as a deterrent to maintain territorial claims, would no doubt affect Chinese citizens.

In general, it has to be remembered that issues of radiation contamination following nuclear disasters or air and water pollution are international causes, which defy the conflicts, which may exist between nation-states, seeing as pollution knows no boundaries. In fact, it is in

the very nature of the environmental movement to be transnational, seeing as if one country addresses its issues of pollution within its own borders, if its neighbor does not also address these issues, that country will continue to be affected.

This is what has allowed for collaboration between environmental organizations and NGOs from Asia Pacific countries otherwise politically at odds with each other, such as many of the claimants

to South China Seas islands. China has taken steps to crack down on international collaboration between NGOs in recent times, fearing that such collaboration will provide foreign agents a means to undermine the Chinese government from within. Yet such actions evidence the hypocrisy of the Chinese state, seeing as the Chinese state seems to fear political threats or what it views as its territorial sovereignty being undermine more than it cares about addressing environmental

issues facing both the Chinese people and other peoples of the Asia Pacific region....

Broadly speaking, although China has done a good job of grandstanding its power on the international, China's naval capacities leave much to be desired. China, for example, only has one aircraft carrier, the Liaoning, a former Soviet

vessel originally slated to be turned into a floating casino. Although China is building a second carrier, this still does not compare to the ten aircraft carriers officially operated by America or the total of nineteen American ships which be classified as aircraft carriers.

Nonetheless, the fact that China has at least put forward the notion of floating nuclear reactors as a nuclear deterrent is out there, and this

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evidences something about the mentality of the Chinese party-state in terms of how it evaluates environmental dangers versus military grandstanding and the need to defend its territorial sovereignty. The values of the Chinese party-state should be clear from this.

Source: <https://newbloommag.net>, 03 January 2018.

OPINION – Justin McCurry, Benjamin Haas, Michael Safi

North Korea Casts Nuclear Shadow Over Asia's 2018

North Korea's nuclear and ballistic missile programmes dominated Asia-Pacific's geopolitical landscape in 2017, and will loom large throughout the year ahead. Pyongyang is enjoying better returns on each test, with the rest of the world seemingly helpless to resist its self-sponsored application to join the global nuclear club.

Its most recent launch involved a powerful intercontinental ballistic missile that, in theory, puts all of America's major cities within range. Evidence that the regime is mastering the technology needed to guide a missile back into Earth's atmosphere could emerge in the first few months of 2018. It's unclear how Trump's administration intends to make good on its promise to "deny" Pyongyang the ability to strike the US mainland. In the 11 months since he took office, the president has failed to articulate a coherent plan to denuclearise the Korean peninsula – and some analysts believe he should now accept that Pyongyang's nuclear genie is out of the bottle.

Repeated attempts to cajole China into inflicting tangible economic pain on North Korea have had mixed results. Beijing has signed off on UN security council sanctions, but is unlikely to deliver what Trump believes would be the decisive blow of stopping oil supplies, a move China fears could

foment regime collapse and create a vacuum filled by South Korea and its US ally. There is little to suggest that Trump has a diplomatic ace up his sleeve.

The biggest test of Trump's Asia policy will come if Pyongyang convinces the US, through more tests, that it can send a nuclear-armed missile all the way to Washington. The North Korean leader, Kim, declared on the US should be aware that his country's nuclear forces were now a reality, not a threat... the fact that China has at least put forward the notion of floating nuclear reactors as a nuclear deterrent is out there, and this evidences something about the mentality of the Chinese party-state in terms of how it evaluates environmental dangers versus military grandstanding and the need to defend its territorial sovereignty. "

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The removal of any doubt over the North Korea's ability to strike the US could have profound consequences for Japan and South Korea, where fears will grow that Washington's commitment

to their security will waver if the US joins them in Kim's crosshairs. Simply put, would the US be prepared to trade San Francisco for Seoul?

A year of provocations from North Korea have played into the hands of Abe, Japan's conservative prime minister, who successfully fought this autumn's general election on the "national crisis" created by the looming missile threat. Abe is expected to strengthen Japan's security in the next 12 months through more defence cooperation with the US, and the reported acquisition of cruise missiles to take out North Korean military targets in pre-emptive strikes – a stance that sits uncomfortably with Tokyo's strictly defensive postwar posture.

Abe and his allies view their country's postwar pacifism as an anomaly – a concession necessitated by wartime defeat but which now is an unfair constraint on its ability to defend itself

against North Korea, and counter Chinese attempts to control over seas near the disputed Senkaku/Diaoyu islands. Abe is expected to put forward an amendment to the constitution that would legalise the status of the self-defence forces, which are a standing military in all but name.

Abe has the votes he needs in parliament but must persuade a sceptical public to back him in a referendum. China's president, Xi, will meanwhile play an increasingly important role on the world stage as Trump reduces US diplomatic efforts, especially in international treaties and tackling climate change. Xi is also likely to step up his overhaul of the military and the sweeping campaign against corruption. The Chinese leader secured a second five-year term in October and has signalled he wants to extend his fight beyond the ruling Communist party to 62 million government workers....

In India, Modi will continue to dominate politics but his sheen could start to wear off in 2018. How the economy fares will be crucial to the political fortunes of the Indian prime minister, as the country gears up for the biggest democratic exercise in the world, its months-long, multi-stage national polls, the results of which won't be known until May 2019...but analysts said such confrontations might become increasingly dangerous as China aggressively expands its influence in south Asia....

Source: <https://www.theguardian.com>, 01 January 2018.

OPINION – Ibu Sanjeeb Garg

Perspective on Nuclear Power in India: Beating the Rhetoric

In 1947, for a nation that was recently independent and had critical energy issues nuclear power seemed to the answer to all

problems. It was billed as environment friendly and a technological boon. The steps towards the nuclear age had started right after independence itself when in 1948 the AEC was set up, with Bhabha as the chairman. Later on the DAE was created under the Office of PM, Nehru. Initially the AEC and DAE received international cooperation, and by 1963 India had two research reactors and four nuclear power reactors. India stood steadfast in its promise of peaceful nuclear energy uses and saw nuclear energy only as a means to solving the energy crisis.

However by the 1970's India had been through three wars and the Cold War era had just started. Thus India too believed that a slight reorientation in its nuclear policies was required and on May 18, 1974 India performed a 15 kt PNE. The international community viewed this as breach of trust of its commitment towards India and issued sanctions against it. Even then India continued to develop its

nuclear programme and exploded both fission and fusion devices on May 11 and 13, 1998. The international community as a serious threat to the CTBT and the NPT viewed this; both deemed essential to stop the spread of nuclear weapons. India's own defence for not signing the treaties is that it feels they favour nuclear states. India was prepared to sign them only if genuine nuclear disarmament is included as an integral part of these treaties. Since then, however, India has been able to pursue a peaceful nuclear doctrine. In 2008 India signed a civilian nuclear agreement with US.... Since then India has entered into multiple agreements with various countries of the world for sharing of nuclear technology. These agreements solved India's long-standing problem of Uranium reserves for nuclear fuel.

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Yet, nuclear power has not been much of a success in India as it was originally envisioned. The nuclear power sector in India has suffered from myriad problems. First and foremost the performance of the completed reactors has not been very good. Their actual output as compared to their possible maximum output is about the same as for thermal and hydroelectric power stations in India (around 45%).

problems. First and foremost the performance of the completed reactors has not been very good. Their actual output as compared to their possible maximum output is about the same as for thermal and hydroelectric power stations in India (around 45%). The high capital costs of nuclear reactors dictate that they must be run at something like 70% or more of maximum output in order to be economically viable.

Secondly India has never been able to substantiate a proper fuel reserve for itself. There have been major efforts in uranium exploration that have absorbed huge financial resources but without any success. Even after thirty years, the country has not been able to find reserves of good quality uranium. With the signing of the civilian nuclear agreement, nuclear fuel could be obtained from other countries. However, for the country to be self sufficient in power a really sizeable nuclear power programme, which is necessary, could not be fuelled by the limited quantity of assured reserves.

Thirdly the development of technology in this sector has not produced the desired results. Although post Independence a major part of the national exchequer has been devoted to research in this sector yet problems still persist. The Indian fuel enrichment plant has still not been able to produce the desired results.

Fourthly, when the huge operating costs are taken into account and a detailed economic analysis of India's power reactors is done then it is seen that nuclear electricity generation has no advantage over hydro or coal-fired generation. Indeed the latter two are considerably cheaper unless the electricity must be transmitted 800 km or more....

The Fukushima reactor disaster in Japan rings as the fifth and the most dangerous problem with a nuclear power plant. It is the operational risk that runs in any nuclear programme. The Chernobyl disaster was pegged at trillions of dollars while scientists are still calculating the damage of the Fukushima disasters in Japan. Human cost of nuclear disaster is massive. Thus the human and economic costs of operating a nuclear plant are huge....

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Apart from these, in the traditional power alternatives some changes must be made in terms of policy making. Fossil fuels like coal, petroleum etc. will not last forever. Hence conspicuous efforts must be made to ensure sustained and judicious use of these available resources. These include measures of upgrading technology to prevent disasters like oil spilling (which wastes a lot of oil) developing better-refined oil transportation facilities (since a large part of refined oil is very often wasted in the largely unorganized network), etc.

Also the most important change must be in the mind-sets of people. The citizens must be made aware of suitable power consumption, which would ensure a strong power delivery in the longer run. People must be made aware of innovative concepts like Green housing. In the long run it will take a sustained government, public partnership to ensure that an alternative to nuclear power is viable and workable. The image of the dead city of Chernobyl even after 25 years of the tragedy still haunts the world. Efforts must be made at any cost to avoid such dangers and the best way out lies in saying 'no to nuclear power.'

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Source: <http://www.theshillongtimes.com>, 10 January 2018.

OPINION – Gregory Kulacki

Should US Nuclear Strategy be More Like China's?

I was born in the USA but spent a lot of years in China. If you asked a thousand people like me which place is better, I'd be astonished if more than five would prefer the PRC. American air is cleaner. American food is safer, if less interesting. Americans enjoy a greater degree of freedom. But when it comes to nuclear strategy, China may be the wiser.

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US nuclear strategy is focused on destroying military targets. The list of targets is classified but we know it isn't short. Remember the final scene of the movie War Games, when the main electronic brain at NORAD runs through a long list of nuclear war scenarios before deciding it would prefer a game of chess? US defence planners use a list just like that that to determine how many and what types of nuclear weapons the US needs. The Obama administration projects the US must spend more than a trillion dollars to continue to implement the current US nuclear strategy, i.e., to maintain the option to hit the military targets on its list. This includes funds for a new generation of nuclear-armed missiles, subs and bombers as well as significant upgrades to complex of laboratories and facilities needed to ensure the safety... .

China's nuclear strategy is focused on damaging a handful of enemy cities. It doesn't need a lot of nuclear weapons to pull that off, which may be why China's nuclear arsenal is a lot smaller. The Chinese military does not disclose how much it spends on nuclear weapons but it is probably safe to assume that it is a fraction of the US nuclear weapons budget.

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is a fraction of the US nuclear weapons budget. International estimates of China's total annual military expenditures place them hundreds of billions of dollars lower than the total annual military expenditures of the US. While its nuclear budget may be secret, China's nuclear strategy is explained with unprecedented clarity in the most recent edition of a Chinese military page-turner called *The Science of Military Strategy*. The authoritative tome, written by a committee of 35 scholars from the Academy of Military Science, echoes the wisdom of the NORAD

computer at the end of War Games. *"After the US and the Soviet Union went through a nuclear arms race and reached a balance of nuclear terror, they could not but face the fact that a nuclear war has no winner."*

According to the authors, the sole purpose of China's nuclear arsenal is "to prevent enemy nations from using or threatening to use nuclear weapons against us." Their logic for targeting cities is straightforward. *"Chinese nuclear deterrence is built on the foundation of effective retaliation, and through this capability presents an enemy with the possibility of the creation of unendurable nuclear destruction, a possibility that accomplishes the objective of preventing an enemy nuclear attack...."*

In plainer English, Chinese strategists assume that when it comes to nuclear war the only winning move really is not to play. The only strategic purpose of nuclear weapons is to keep a nuclear war from starting, i.e. to deter an enemy nuclear attack. According to the text, Chinese strategists believe the most efficient and effective method is to convince their enemies that a nuclear attack on China will cost them a few major metropolitan areas. They are betting no

nuclear-armed adversary would make that trade. The Chinese may have a bad reputation for gambling, but that seems like a pretty good bet. So why is US nuclear strategy so much more complex? Why won't the US make the same bet?

One reason is that US strategists want to preserve the option to use nuclear weapons for war fighting. So US strategy calls for targeting a long list of military and industrial sites, with the idea of crippling its adversary's military capability if a crisis started. Obama's 2011 review of US nuclear policies reiterated a reliance on this "counterforce" strategy. In part, US strategists see this policy as strengthening deterrence, since a US president could be self-deterred by moral reservations about retaliating with nuclear weapons against cities. But it's a moral distinction without a difference. The twenty W88 warheads US nuclear planners would use to destroy the Chinese DF-5A missile silos just outside the ancient city of Luoyang would also kill between five and twenty-five million Chinese civilians, depending on the weather. Only the egregiously hypocritical would argue such a US strike is morally superior to a Chinese nuclear attack on Los Angeles because it is aimed at a military target....

Finally, this strategically questionable distinction between military and civilian targets guides US thinking about the credibility of extended nuclear deterrence for its allies. US strategists apparently assume, for example, that US threats of nuclear retaliation against Chinese military targets are more credible than US threats of nuclear retaliation against Chinese cities because it decreases the possibility of Chinese retaliation against US cities, despite Chinese claims to the contrary. This dubious US assumption is supposed to assure the Japanese government that the US would not be deterred from launching against China, thereby making extended deterrence more credible... .

The US strategic focus on the destruction of military and industrial targets requires a much larger US arsenal than if its target list were confined to retaliation against a small number of enemy cities, like China's. It also suggests US strategists are more likely to use nuclear weapons in a military conflict

than their Chinese counterparts, who argue a nuclear war cannot be won and that the only strategic purpose of nuclear weapons is to deter their use by other nuclear-armed states.

In truth, the first and last time that any nation actually used a nuclear weapon was seventy years ago. When you visit Hiroshima and Nagasaki it becomes easier to understand why the probability that any nation will intentionally use one again is very close to zero. Some American officials like to say the US uses nuclear weapons every day for deterrence. But is there any reason to believe that US requirements for nuclear deterrence should be so much higher than China's? Is there really a strategically or morally significant advantage in choosing military over civilian targets? Is maintaining whatever distinction might exist worth the increased risk of a nuclear exchange? Is it worth the increased expense?...

Source: <https://www.huffingtonpost.com>, 09 January 2018.

OPINION – Harry J. Kazianis

Why 2018 will be North Korea's year

If at the end of 2016 someone told me I would spend nearly the entire year watching North Korea test long-range missiles that could potentially strike the US homeland and a hydrogen bomb, with prominent national leaders daily weighing the chances of potential war, I would have said they sipped a little too much spiked eggnog. To be honest, until this year, most national security experts including yours truly, thought the real threat from Pyongyang wasn't nuclear weapons but regime collapse that would force an international crisis of the gravest of magnitudes.

And while there has been fears since the late 1990s that North Korea could eventually develop technology to hit America with a nuclear tipped missile, most assumed such a threat was years away. North Korea was known more for failed missile tests than successes, with many doubting if the so-called hermit kingdom could ever really become a true nuclear power with global reach. But failure can be one of the greatest teachers

and make no mistake, going into 2018, the world's collective gaze will be cast upon North Korea once again. Kim and his band of bad guys are committed to developing a military armed to the teeth with evermore advanced weapons that, as Secretary of Defense Mattis pointed out, "threaten everywhere in the world". In many respects, 2018 will be a virtual repeat of 2017: more missile tests starting in the early spring followed by at least one big nuclear tests, lots of fiery rhetoric from both sides and a Trump administration agonizing over how best to respond.

So what can we expect from North Korea going into the New Year? To put it simply: more of the same. Here are six things I will be watching in 2018—and why next year will bring far more tensions from the Kim regime—with the possibility of armed conflict now closer than ever before.

More Long-Range Missile Tests: Yes, North Korea slowed the number of missiles tests it conducted as 2017 closed. And, to be fair, if history tells us anything, we won't see a tremendous amount of missile tests until the spring. But, Pyongyang will test its Hwasong-15 ICBM at least once more in the next few weeks, following a pattern of testing all new missile platforms at least twice. From there, North Korea has more advanced solid-fuel missiles that it has been developing for years that could be even more dangerous. Look for a test of those systems, along with the accompanying pictures and video, sometime in 2018.

Submarine Launched Missiles: While Pyongyang for sure has been working on nuclear-tipped missiles that can be fired from under the sea, we

should expect the pace and scope and such tests would quicken next year. With the regime likely working on a new submarine design, Kim will be eager to demonstrate any new advances his underwater nuclear program may have made. And with some speculating this new weapon could have a range of three to four thousand kilometers, Kim would have another dangerous platform to attack US allies and bases all over Northeast Asia and eventually beyond.

Nuclear Weapons Tests: Recent reports show North Korea tunneling once again at their nuclear proving grounds, demonstrating that Kim is not done testing nuclear weapons. Expect the regime to test at least one more nuclear weapons design next year, an attempt to ensure they have a weapon that is compact enough to fit atop any of their missile designs that also has the destructive power to turn a US or allied city into ash....

No Help from China: With President Trump's new national security strategy just being released, a document that labels China a revisionist power and attempts to tackle Chinese "economic aggression," Beijing will not exactly have that warm and fuzzy feeling towards Washington. Such an action, just about as badly timed as you can imagine, will only cement China's view that it has done all it can to help America contain the North Korea threat—and should do no more. There will be no oil embargo imposed by China. What seems more likely is a slow and steady weakening of sanctions—Beijing's standard playbook.

China's goal on North Korea is quite simple: make sure North Korea does not collapse or start a war and use its ally to keep America from worrying

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China's goal on North Korea is quite simple: make sure North Korea does not collapse or start a war and use its ally to keep America from worrying about China's push to dominate the South China or East China's Seas or Taiwan. While Beijing might not likely Pyongyang's aggressive push to develop nuclear weapons and missiles, it will use such moves to its advantage.

about China's push to dominate the South China or East China's Seas or Taiwan. While Beijing might not likely Pyongyang's aggressive push to develop nuclear weapons and missiles, it will use such moves to its advantage. That's just International Relations 101.

No Help from Russia: While things with Moscow might be warm and fuzzy for now, just as in the case of China above, President Putin will not take too kindly to being labelled essentially an enemy of America. While he will likely see through the new "America First" national security strategy as what such strategies always are—a mission statement-style document that most administrations launch and quickly forget about—he has very little incentive to do much on this issue.

Just like China, Putin has every incentive to make sure North Korea does not collapse or start a war, but likes the idea of America being bogged down over Kim's nuclear and missile programs—as Russia has its own national security objectives to focus on without American interference.

2018 will be the Year of North Korea: The above only scratches the surface of what will be a year filled with North Korea related headlines and times of tension. In many respects, 2018 will be a virtual repeat of 2017: more missile tests starting in the early spring followed by at least one big nuclear test, lots of fiery rhetoric from both sides and a Trump administration agonizing over how best to respond.

The good news, if there is any when it comes to North Korea, is that we have been down this road before, with a so-called "rogue regime" that is hell-bent on developing nuclear weapons and the missiles to slam them into our homeland—think murderers of millions Mao and Stalin.

Unless we are attacked first, right now, America can easily contain and deter North Korea, a nation that has an economy the size of Vermont. There is no need to embark on a dangerous war of choice... Sanctions combined with international isolation—while not the fastest way to bring Kim and his band of thugs to the table—will work. If not, and the administration decides to embark on

the so-called "military option," well, 2018 could be a year like no other.

Source: <http://www.foxnews.com>, 18 December 2017.

NUCLEAR STRATEGY

PAKISTAN

Pakistan's Credible Nuclear Deterrence Only Thing Stopping India from War: DG ISPR

The Director General of Inter-Services Public Relations (ISPR) Maj Gen Asif Ghafoor responded to the Indian army chief's 'nuclear bluff' assertion saying that such statements are unbecoming from a person of a responsible stature. Indian Army Chief Gen Bipin Rawat said the force was ready to call Pakistan's 'nuclear bluff' and cross the border to carry out any operation if asked by the government, according to Indian media outlets. "We will call the [nuclear] bluff of Pakistan. If we will have to really confront, and a task is given to us, we are not going to say we cannot cross the border because they have nuclear weapons. We will have to call their nuclear bluff," Gen Rawat said at a press conference.

Speaking to state TV's world service, the Pakistani military spokesman said, "We believe COAS is a very responsible appointment and four-star is a rank with age-long experience and maturity." Asked what if India undertakes any misadventure against Pakistan, Ghafoor said, "Well, it's their choice. Should they wish to test our resolve they may try and see it for themselves." The DG ISPR said that Pakistan has a credible nuclear capability, exclusively meant for threat from the east. "But we believe it's a weapon of deterrence not a choice."

Responding to a question about New Delhi's role in destabilising Pakistan through state-sponsored terrorism, he said if India could overpower Pakistan through conventional engagement post-overt nuclearisation, it could have done that by now.

"The only thing stopping them is our credible nuclear deterrence as there is no space of war between the two nuclear states," the Pakistan

Army general said. "That's why they are targeting us through sub-conventional threat and state-sponsored terrorism," he said, adding, "But they have failed on this account as well. "We are a professional army, responsible nuclear state and resilient nation," the DG ISPR said. "They must not remain in illusion," he warned.

Source: <https://www.geo.tv>, 13 January 2018.

USA

US to Loosen Nuclear Weapons Constraints and Develop More 'Usable' Warheads

The Trump administration plans to loosen constraints on the use of nuclear weapons and develop a new low-yield nuclear warhead for US Trident missiles, according to a former official that has seen the most recent draft of a policy review. Wolfsthal, who was special assistant to Obama on arms control and nonproliferation, said the new nuclear posture review prepared by the Pentagon, envisages a modified version of the Trident D5 submarine-launched missiles with only part of its normal warhead, with the intention of deterring Russia from using tactical warheads in a conflict in Eastern Europe.

The new nuclear policy is significantly more hawkish than the posture adopted by the Obama administration, which sought to reduce the role of nuclear weapons in US defence. Arms control advocates have voiced alarm at the new proposal to make smaller, more "usable" nuclear weapons, arguing it makes a nuclear war more likely, especially in view of what they see as Donald Trump's volatility and readiness to brandish the US arsenal in showdowns with the nation's adversaries.

The NPR also expands the circumstances in which the US might use its nuclear arsenal, to include a response to a non-nuclear attack that caused mass casualties, or was aimed at critical

infrastructure or nuclear command and control sites. The nuclear posture review (NPR), the first in eight years, is expected to be published after Trump's State of the Union speech at the end of January.

Wolfsthal, who has reviewed what he understands to be the final draft of the review, said it states that the US will start work on reintroducing a sea-launched nuclear cruise missile, as a counter to a new ground-launched cruise missile the US has accused Russia of developing in violation of the 1987 INF treaty. Wolfsthal said that earlier drafts of the NPR was even more hawkish. The final draft drops proposals to develop a nuclear hyper-glide weapon, and to remove assurances to non nuclear weapons states that the US will not use its nuclear arsenal against them.

... The development of a low-yield warhead for a sea-launched ballistic missile is based on the belief that in any conflict with Russia on NATO's eastern flank, the Russians would use a tactical

nuclear weapon early on, to compensate for their relative weakness in conventional arms. The Russians, the argument goes, would count on US reluctance to use the massive warheads on its existing weapons, leading Washington to back down. Kristensen, the director of the nuclear information project at the Federation of American Scientists, said that justification for developing the new weapons was incoherent. ...

Source: <https://www.theguardian.com>, 09 January 2018.

BALLISTIC MISSILE DEFENCE

USA-JAPAN

Trump Admin Approves \$133 Million Anti-Ballistic Missile Sale to Japan

The Trump administration notified Congress on that it has approved the potential sale of SM-3 anti-ballistic missiles to Japan in a deal estimated

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to be worth \$133.3 million, according to a State Department statement. Included in the sale are four Standard Missile-3 (SM-3) Block IIA missiles, four MK 29 missile canisters, and other technical, engineering and logistics support services. The SM-3 Block IIA is an anti-ballistic missile that can be employed on Aegis-class destroyers or on land, via the Aegis Ashore program, according to a State Department official. "If concluded, this proposed sale will contribute to the foreign policy and national security interests of the US by enhancing Japan's Maritime Self Defense Force's... ability to defend Japan and the Western Pacific from ballistic missile threats," the official said.

The sale would also "follow through on President Trump's commitment to provide additional defensive capabilities to treaty allies" threatened by North Korea's "provocative behavior," the official added. Throughout 2017, North Korea has conducted a series of ballistic missile tests despite constant criticism from the West and trade sanctions.

The most provocative moment came November 29, when North Korea said it successfully tested a new type of intercontinental ballistic missile, topped with a "super-large heavy warhead" which it said was capable of striking the US mainland.

Last month, Japan's cabinet approved a plan to buy two US-built Aegis missile defense systems, state broadcaster NHK reported, as the country faces increasing hostility from neighboring North Korea. Russia slams US plan to sell anti-missile system to Japan. Russia accused the US of violating an arms control treaty by agreeing to

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supply anti-missile systems to Japan. Russian Foreign Ministry spokeswoman Zakharova said the deal with Japan was part of a bigger plan by the US for a "global anti-missile system." Zakharova claimed they were in breach of the INF Treaty, an arms control agreement between Moscow and Washington that has been in force for

30 years.

... Secretary of Defense Mattis spoke with Japan Minister of Defense Onodera on to discuss a range of US-Japan alliance matters and reaffirmed US commitments to the defense of Japan, pledging to work closely with his Japanese counterpart to bolster critical alliance capabilities.

Source: <http://edition.cnn.com>, 10 January 2018.

NUCLEAR ENERGY

CHINA

China Starts Work on "Landmark" Fourth-Generation Fast Breeder Reactor

China has begun pouring concrete for one of the world's first "gen IV" nuclear reactors, the CFR-600, on the coast of Fujian province, about 400km south of Shanghai. The 600MW demonstration unit, which is due to be complete in 2023, follows a 20MW experimental reactor completed in 2011.

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reactor completed in 2011. It is intended to be the prototype of a 1GW commercial reactor scheduled for around 2030. The significance of the sodium-cooled reactor is that it points the way to the "fast breeder" fourth generation designs that are expected to be adopted by the global nuclear power industry over the next century.

It is not the only design that the Chinese industry

is pursuing. Another fast breeder gen IV is being built in nearby Jiangxi province. This uses “pebble-bed” fuel and a helium cooling system. The advantage of these reactors, which use fast neutrons to split uranium atoms, are that they are about 60 times more fuel-efficient than slow reactors, they generate less radioactive waste and they can be used in a “closed cycle” system, in which waste is reprocessed into new fuel.

This last requirement is particularly important for China, which is planning a massive expansion of its nuclear fleet, but it concerned about future shortages of uranium. The China Institute of Atomic Energy, which designed the CFR-600, is envisaging an increase in output from 40GW in 2015 to 400GW in 2050, at which time it is forecast that it will account for 16% of the country’s 2,500GW installed capacity. ...

Source: <http://www.globalconstructionreview.com>, 03 January 2018.

GENERAL

It’s Time for the West’s Nuclear Renaissance

Despite political instability in many parts of the world, the global economy is ending 2017 in good shape, and cheap energy is the foundation of it. Asia continues to set the pace; US growth is encouraging, and the Eurozone is stronger than it has been for a decade. Investors aren’t yet spooked by the prospect of higher interest rates, and equity markets remain buoyant.... But abundant, secure and cheap energy can’t be taken for granted. In the last eighteen months four developments, which taken together are capable of overturning the status quo, have emerged. If the West ignores them, it risks missing out on the economic and security benefits of the next energy revolution.

The relative decline of nuclear in the West is the result of a misperception of costs, and the militancy of activists, who ignore nuclear energy’s vital contribution to decarbonising electricity.

The first is the growing political consensus about climate change. Action to cut carbon emissions is accelerating. New coal projects are hard to finance because investors are scared of being left with stranded assets.

The second is Trump’s repudiation of the Paris Accord. Mr. Trump has handed leadership of the world’s response to climate change to China where

President Jinping eagerly seizes it.

The third is the faster than expected expansion of renewable energy. The addition last year of 161 gw of renewable energy capacity worldwide—four times more than ten years earlier—is unreservedly welcome, but it doesn’t mean that renewables can be relied on to meet the entire energy needs of the world, however much their starry-eyed advocates wish they could. Without the availability of flexible, large scale, low cost and long-term electricity storage, renewables can’t guarantee security of energy supply without massive and expensive back up capacity.

The fourth is the growing geographical divergence of attitudes towards nuclear power. The old economies of Western Europe and the US, apart from the UK, are shunning investment in new nuclear capacity. By contrast new high growth countries, the BRICS and beyond, in Asia, the Middle East and elsewhere, together with east and central Europe, are planning ambitious nuclear new build programs.

The relative decline of nuclear in the West is the result of a misperception of costs, and the militancy of activists, who ignore nuclear energy’s vital contribution to decarbonising electricity.

This interaction of these four factors poses untenable risks. Many actors, including China, will back up the growth in renewables with increased nuclear capacity.

By 2030 concern about climate change will have intensified enormously. China, whose emissions will then be falling rapidly, may propose, with strong backing from the EU, the immediate imposition of a substantial international carbon price, designed to speed the demise of fossil fuels.

Countries, which have successfully prepared to be fossil fuel free by the end of the 2030s, will flock to support this proposal.

Others, who rely on gas, will be waking up to a nasty shock.... The price of nuclear could be lower too if common sense international cooperation on safety standards grows and economies of scale kick in. Russia's Rosatom, which is now building more of the latest generation reactors than all other vendors combined, provides a good example for how the economies of scale reinforce the competitiveness of nuclear. The Russians are also likely to be the first to commercialise fast breeder reactors that recycle spent nuclear fuel from conventional reactors, effectively solving the problem of waste and turning nuclear into a form of renewable energy....

Particularly galling for the West, already reeling from the consequence of Chinese success in the solar industry, in these circumstances would be the dominance of foreign nuclear companies. Flawed policies have already pushed the Western nuclear vendors, such as Westinghouse and Areva, to the brink of survival. Anti-nuclear prejudice in the West hampers the prospects of their revival.

The message to policy makers is clear. Recognise where the urgency of the climate change challenge is taking us. Accept that the era of fossil fuel consumption, which powered the economic growth of the last century, is over. Understand the limitations of renewable energy and embrace

nuclear as its natural complement. The necessary nuclear renaissance won't win short-term political plaudits. Instead, it will do something far more valuable and enduring. It will deliver to grateful consumers and voters clean, reliable and affordable energy, coupled with economic benefits for those countries smart enough to be competitive in the industries that supply it.

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Source: <http://nationalinterest.org>, 07 January 2018.

INDIA

Westinghouse Bailout Fuels Hope for India's Nuclear Energy Sector

The New Year has brought a fresh ray of hope in India's nuclear energy sector, with Westinghouse, the bankrupt energy company being sold to a Canadian investment major, Brookfield Business Partners. Westinghouse is supposed to build six of its AP-1000 nuclear reactors in India, a project that had been delayed after the company filed for bankruptcy earlier in 2017.

The \$4.6 billion acquisition is expected to get the beleaguered US-Japanese company out of hot water. Toshiba, the owner of Westinghouse had been looking to sell the nuclear business after it filed for bankruptcy.

Westinghouse had, in its discussions with the Indian government, assured that it would continue to work on the six reactors which are expected to come up in Kovvada, Andhra Pradesh. KM Rajan, former India representative of Westinghouse, told a nuclear energy conclave recently, "we expect to be out of bankruptcy Chapter 11 process sometime in early next year. We will be out of that, so it will not have any

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impact (on the nuclear project in India).”

There may be a need to tweak the plans somewhat, sources said. Reports quoted Westinghouse officials as saying that the company’s main focus after emerging from bankruptcy would be component construction. The company is expected to build six reactors in India — private sector and government entities are currently exploring whether a greater amount of indigenous components can be used to build these reactors, bringing down their costs as well as giving a fillip to Indian nuclear industry.

The immediate cause of its bankruptcy was the time and cost overruns that derailed four AP-1000 reactors in South Carolina and at Plant Vogtle in Georgia in the US.

Trying to allay concerns on this score, Union minister Jitendra Singh told Parliament, “The AP 1000 reactors of WEC are state of the art in terms of technology and safety and are comparable to the latest reactors developed by other countries. Their cost effectiveness in the Indian context would depend on the business models adopted and the current discussions are aimed at arriving at a viable project proposal.”

Singh added, “There is presently no change in the plan to set up nuclear power reactors at Kovvada in cooperation with M/s Westinghouse (WEC) of USA. Discussions are in progress between NPCIL and WEC to arrive at a viable project proposal. The filing of bankruptcy by WEC and subsequent developments have been noted and factored in the discussions. The project will be set up on emergence of a viable project proposal and accord of administrative approval and financial sanction of the Government.”

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CGN and CEA will deepen cooperation in the upstream and downstream nuclear power industry chain, including reactor life management and the concept design of the fourth-generation nuclear energy technology.

Source: Indrani Bagchi, *The Times of India*, 10 January 2018.

NUCLEAR COOPERATION

CHINA–FRANCE

China, France Sign Deal to Enhance Cooperation on Nuclear Energy

A Chinese nuclear power operator signed an agreement with a French energy organization to deepen cooperation on nuclear power technology. The deal, between China General Nuclear Power Corporation (CGN) and the French Alternative Energy and Atomic Energy Commission (CEA), focuses on areas such as nuclear reactor technology, advanced fuels and materials, and nuclear fuel cycles.

Under the agreement, CGN and CEA will deepen cooperation in the upstream and downstream nuclear power industry chain, including reactor life management and the concept design of the fourth-generation nuclear energy technology. He Yu, chairman of CGN, said the new agreement would enhance bilateral exchanges in nuclear power technology and open new space for Sino-French nuclear power cooperation.

Founded in 1994, CGN is the largest nuclear power operator in China, with 39,000 employees worldwide. It focuses on the development of clean energies such as nuclear power, nuclear fuel, wind power and solar power. The CEA is a key organization in research, development and innovation in France. Its main areas include defense and security, nuclear and renewable energy, and physical and life sciences.

Source: <http://www.xinhuanet.com>, 09 January 2018.

INDIA–PAKISTAN

India, Pak Exchange List of Nuclear Installations Under 30 Year-Old Pact

India and Pakistan exchanged a list of nuclear installations that the two countries have under a three-decade-old bilateral pact to maintain transparency and avoid attacking each other's nuclear facilities....

In September 2017, India's atomic chief Dr. Basu had told NDTV that thanks to new explorations, India could now call itself a uranium-endowed country. "When I joined the atomic energy programme we were told India has just about 60,000 tonnes of mineable uranium. But today the quantity has grown by four to five times. Government is fully supporting us to make India uranium self-sufficient," Dr Basu had said during a visit by NDTV to Jaduguda uranium mine, the oldest site in the country.

The locally mined uranium is supplied to generate electricity and also to power nuclear weapons capability. India currently has 22 operating nuclear power plants, which have an installed capacity of 6,780 MW. Of these, the two nuclear plants at Kudankulam in Tamil Nadu are run on uranium imported from Russia.

Russia will continue supplying uranium for the entire 60-year life of the atomic plants. Each 1,000 MW reactor of Kudankulam needs several tonnes of uranium to function round-the-clock. "The plant is ready to supply fuel to Kudankulam on a long-term basis," Zhiganin, the chief of Novosibirsk Chemical Concentrates Plant, the uranium processing facility in Russia's Siberia, told NDTV last month. "We are happy about the results of our co-operations and we have very good technical results of our nuclear fuel exportation to the nuclear reactor," he added.

Source: <https://www.ndtv.com>, 01 January 2018.

TURKEY–CHINA

Turkey Looks to China for Third Nuclear Power Plant

Turkey and China are taking steps to address rising domestic energy demand through the use of nuclear power. In 2016, Turkey hosted the 23rd Annual World Energy Congress, the global flagship event of World Energy Council, where the theme was "embracing new frontiers." At the event, Turkish PM Yıldırım announced Turkey's goal of

increasing nuclear energy to 10% of total Turkish power generation by 2023. Turkey's most recent step towards this goal was the ratification of the Agreement for Cooperation between Turkey and China

in the Use of Nuclear Energy for Peaceful Purposes (the "Turkey-China Nuclear Cooperation Agreement"), which was signed on September 2, 2016, immediately before the World Energy Congress.

Turkey and China inked this Cooperation Agreement in 2012; however its ratification and publication had been pending for 4 years. This waiting period was considerably beneficial for Turkey, giving it the chance to approve a full-scope engineering survey regarding the first NPP to be constructed in Akkuyu and Sinop in cooperation with Japan. The land allocation and the execution of an IGA between Turkey and Japan were significant steps forward in developing expertise in the construction of NPPs in Turkey. Despite the government's busy schedule with the Akkuyu and Sinop NPPs, the relationship between the Chinese and Turkish governments has improved, thanks to their endeavour to reinforce their nuclear partnership through official visits and correspondence.

Signing the Turkey-China Nuclear Cooperation Agreement in 2012 paved the way for the "tripartite" MoU on November 24, 2014 between (a) the Chinese State Nuclear Power Technology Corporation, ("SNPTC"); (b) Turkey's state owned electricity generation company EÜA^a

But today the quantity has grown by four to five times. Government is fully supporting us to make India uranium self-sufficient," Dr Basu had said during a visit by NDTV to Jaduguda uranium mine, the oldest site in the country.

("EÜA^a"); and (c) the US-based Westinghouse Electric Company ("**Westinghouse**"). The MoU provided exclusive negotiation rights to the SNPTC and Westinghouse for Turkey's third nuclear power plant, and Westinghouse and SNPTC prepared a report under EÜA^a's supervision where possible sites for the third NPP were assessed with respect to the technical parameters such as transmission infrastructure, on-site geological formations, and seismic activity levels. EÜA^a and the Ministry of Energy and Natural Resources are currently reviewing this report. Even though this MoU grants exclusive negotiation rights to the SNPTC and Westinghouse, and moves them to the front of the line in terms of future competition, it does not constitute a definitive document for the negotiations for the third NPP. For that reason, the MoU constitutes a nonbinding sign of the parties' common goal.

Following the execution of the MoU at the corporate level in June 2016, the current Minister of Energy and Natural Resources, Albayrak signed another MoU for the development of nuclear power technologies with Bekri, the Director of China's National Energy Administration. Albayrak and Bekri had a chance to further elaborate on the Turkish and Chinese governments' intention to become partners in this field during G20 Summit held in China, and its sideline event, the G20 Energy Ministerial Meeting, which aimed to bring together key players in energy sector.

The Grand National Assembly of the Republic of Turkey ("**National Assembly**") ratified the Turkey-China Nuclear Cooperation Agreement in August 2016, giving it the force of law. This strongly demonstrates that Turkey aims to become self-sufficient in terms of energy supply by having its own NPPs. Cooperation areas stated in the said agreement such as research and development, training of nuclear engineers, and the exchange of qualified scientific and technical personnel

also confirms Turkey's intention to develop its own human resources in the long term in order to become a global competitor.

Turkey is already familiar with bilateral nuclear agreements. The legal framework for both the Akkuyu and Sinop nuclear power plants was set out by specific agreements for cooperation, i.e. bilateral treaties at the state level. These IGAs allowed the countries to build a legal regime to apply to a particular project, which will provide exemptions from laws of general applicability with an intention to providing stability of legislation to the project in question. Another advantage of building a project-specific legal regime structure

Cooperation areas stated in the said agreement such as research and development, training of nuclear engineers, and the exchange of qualified scientific and technical personnel also confirms Turkey's intention to develop its own human resources in the long term in order to become a global competitor.

based on an international agreement is that Article 90 of the Turkish Constitution eliminates the risk of invalidation.... The IGA often includes a host government agreement ("**HGA**") in its annexes, to be signed by the project company and the host country's officials. It usually

spells out the exemptions to be granted to the project company in specific detail and is usually ratified by the government at the same time as the IGA.

Turkey employed the IGA-HGA structure for both the Akkuyu and Sinop NPP projects. With regards to the Akkuyu NPP, ratification of the Agreement for Cooperation in the Use of Nuclear Energy for Peaceful Purposes between Turkey and Russia was officially announced on February 12, 2011, without an HGA appended to it.... For Sinop, ratification of the Agreement for Cooperation in the Use of Nuclear Energy for Peaceful Purposes between Turkey and Japan was published in the Official Gazette on April 22, 2014, and entered into force on May 23, 2015, together with the Memorandum of Cooperation and its appendix template HGA. Together, these agreements constitute the IGA between the two governments for the construction of Turkey's second nuclear plant, to be established in Sinop.

While the entry into force of international agreements concerning nuclear energy issues continues at a rather increased pace, adoption of domestic laws by the National Assembly and/or authorized governmental authorities cannot keep pace with these intergovernmental arrangements. Current legislation in Turkey mainly focuses on rather technical matters, such as the equipment supply process, the approval of manufacturers, or the inventory principles of nuclear substances....

Source: <https://www.lexology.com>, 03 January 2018.

URANIUM PRODUCTION

CANADA

Supply Cuts a 'Step Change' for Uranium Price

The announcement made by uranium giant Cameco in November that it's suspending operations at its flagship McArthur River mine in northern Saskatchewan and surprisingly deep three-year cuts by Kazakhstan's state-owned Kazatomprom provide a "step change" for uranium prices says a new report on the sector from Cantor Fitzgerald equity research.

On, the world largest producer of uranium, surprised the beleaguered market with a larger than expected cut to production of its own. Two weeks ago Kazakhstan's state-owned Kazatomprom announced intentions to reduce its output of U₃O₈ by 20% or 11,000 tonnes (around 28.5m pounds) over the next three years beginning in January 2018. According to the company roughly 4,000 tonnes will be cut in 2018 alone "representing approximately

7.5% of global uranium production for 2018 as forecast by UxC."

Cameco's shuttering of McArthur River for ten months is expected to reduce production by 13.7m pounds in 2018 translating to a combined 42.3m pounds of expected production that has been removed from the market. In 2018 alone, the reduction will be about 24.1m pounds of U₃O₈ or about 15% of Cantor Fitzgerald's prior forecast

of 158.4m pounds of output.... We expect these events to ultimately push spot uranium prices to the mid-high US\$20/lb range and perhaps into US\$30/lb. However, as seen so far, the degree of movement may be muted at first due to fact that there are a limited number of qualified purchasers of uranium – making it a less efficient market.

We estimate that less than 10% of total uranium demand for 2018 and 2019 are uncovered, as utilities have shored up what were once large shortages through spot purchases or short-term contracts. As such, there is less of an impetus

for utilities to make purchases immediately. Inventory levels are also a concern as we estimate that there are 800-1,200M lbs of total above ground inventory of which about 700-800M lbs are held by utilities. We do not believe that all of it is available for sale as significant

portions are held for strategic purposes and necessary utility needs. Moreover there is the possibility of sales from distressed utilities and by utilities with reactors that are being decommissioned.... Prices will gain in 2019 and by 2020 retake the \$40 level. Long term pricing of \$80 a pound remains unchanged.

Source: <http://www.mining.com>, 18 December 2017.

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NUCLEAR PROLIFERATION

NORTH KOREA

Russia Urges US-North Korea Talks over Nuclear Crisis

Russian Foreign Minister Lavrov has urged the US and North Korea to start negotiations amid growing tensions over Pyongyang’s nuclear programme. Lavrov told the state-run RIA news agency.... There is a need to develop relations with North Korea to resolve the nuclear dispute on the Korean Peninsula.” He said, we firmly believe that not only North Korea, but also the US, as well as their allies, should refrain from any steps that could provoke a crisis, and finally launch the negotiation process.” ...

UN Sanctions: Russia’s call for dialogue comes after the 15-member UNSC unanimously voted to impose tough new sanctions on North Korea in response to its latest missile test on November 29. Russia as well as China supported the new move, despite previously raising concerns that not enough was being done to promote diplomatic resolutions to tensions on the Korean Peninsula. The measures order North Koreans working abroad to return home within two years and ban nearly 90 percent of refined petroleum exports to the country.

The latest sanctions were the third imposed on Pyongyang this year in an attempt to prevent it from furthering its nuclear and missiles programme. Following the vote, US President Trump endorsed the stricter measures, saying on Twitter “The World wants Peace, not Death!” North Korea’s foreign ministry slammed the latest round of measures as “an act of war”. North Korean leader Kim’s government has conducted

several missile tests in 2017, which have drawn condemnation from the international community.

Source: <http://www.aljazeera.com>, 25 December 2017.

Trump Taunts North Korea: My Nuclear Button is ‘Much Bigger,’ ‘More Powerful’

President Trump on taunted North Korean leader Kim, warning Kim about US nuclear capabilities as tensions worsen between the two nations. “North Korean Leader Kim just stated that the ‘Nuclear Button is on his desk at all times.’ Will someone from his depleted and food starved regime please inform him that I too have a Nuclear Button, but it is a much bigger & more powerful one than his, and my Button works!” Trump

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tweeted.

North Korean Leader Kim just stated that the “Nuclear Button is on his desk at all times.” Will someone from his depleted and food starved regime please inform him that I too have a Nuclear Button, but it is a much bigger & more powerful one than his, and my Button works! The evening message followed more than a dozen others Trump had sent throughout the day on issues ranging from *The New York Times’* coverage of his administration to conflict in the Middle East. Kim said in his annual New Year’s Day address “The entire mainland of the US is within the range of our nuclear weapons and the nuclear button is always on the desk of my office. They should accurately be aware that this is not a threat but a reality.” In the address, Kim also expressed a desire for a peaceful resolution with South Korea, a break from the aggressive language he used to threaten the US.

Will someone from his depleted and food starved regime please inform him that I too have a Nuclear Button, but it is a much bigger & more powerful one than his, and my Button works.

Trump, as part of his morning tweet storm, said

the potentially warm gesture to South Korea from Kim is “perhaps” good news, “perhaps not,” and referred to “sanctions and ‘other’ pressures” on North Korea. Sanctions and “other” pressures are beginning to have a big impact on North Korea. Soldiers are dangerously fleeing to South Korea. Rocket man now wants to talk to South Korea for first time. Perhaps that is good news, perhaps not - we will see!...

Recent years have seen North Korea display increasing strength in its nuclear weapons and ballistic missile development, while Kim makes provocative statements threatening to attack his enemies. In November, North Korea claimed it had the capability to attack any part of the US mainland. The UNSC has voted to ratchet up sanctions in response to the continued development of North Korea’s nuclear program....

Source: <http://edition.cnn.com>, 03 January 2018.

NUCLEAR NON-PROLIFERATION

IRAN

Iran rejects Trump’s call for changes to nuclear deal

Iran has said it will not accept any changes to the terms of the 2015 nuclear deal, after US President Donald Trump threatened to pull out of the agreement unless its “terrible flaws” are fixed. The Islamic Republic’s foreign ministry said in a statement that it would not “move beyond its commitments” to the existing agreement, to which Trump has extended the US commitment for another 120 days, Iran’s state-run IRNA reported. “Iran strongly announces that it will make no measure beyond its Joint Comprehensive Plan of Action (JCPOA) commitments and will make no changes in the nuclear deal neither now nor in the future,” the statement said.

... Trump announced on 12 January 2018 that the US would keep the pact in place and waive sanctions against Iran for the “last time”, in order to secure agreement from the US’ European allies to fix its “terrible flaws”. “Despite my strong inclination, I have not yet withdrawn the United States from the Iran nuclear deal,” he said in a statement.

Trump said four “critical components” must now be worked into the agreement: immediate inspections at all sites requested by international inspectors, measures to ensure Iran “never even comes close to possessing a nuclear weapon”, no policy “expiration date”, and no distinction between the Islamic Republic’s long-range missile and nuclear weapons programmes regarding the imposition of sanctions.

“Instead I have outlined two possible paths forward: either fix the deal’s disastrous flaws, or the United States will withdraw,” he added. “This is the last chance. In absence of such an agreement [between the

US and European powers], the United States will not again waive sanctions in order to stay in the Iran nuclear deal.”

‘Critical Components’: Trump said four “critical components” must now be worked into the agreement: immediate inspections at all sites requested by international inspectors, measures to ensure Iran “never even comes close to possessing a nuclear weapon”, no policy “expiration date”, and no distinction between the Islamic Republic’s long-range missile and nuclear weapons programmes regarding the imposition of sanctions.

The US president is required to renew the existing deal every 120 days under American law. ...

Source: <http://www.aljazeera.com>, 13 January 2018.

Iran Says it Might Reconsider Cooperation with Nuclear Watchdog

Iran said, it might reconsider its cooperation with the nuclear watchdog if the US failed to respect its commitments in the nuclear deal Tehran struck with world powers in 2015. US President Trump must decide by mid-January whether to continue waiving US sanctions on Iran’s oil exports under the terms of the nuclear pact that eased economic

pressure on Tehran in exchange for limits on its nuclear program.

In October, Trump refused to certify that Iran was complying with the deal, also known by its acronym JCPOA.... "If the US does not meet its commitment in the JCPOA, the Islamic Republic of Iran would take decisions that might affect its current cooperation with the IAEA".... The IAEA is ... scrutinizing Iran's compliance with the agreement. Supporters of the deal insist that strong international monitoring will prevent Iran from developing nuclear bombs. Iran has denied that it is seeking nuclear weapons....

"The international community might come to this conclusion that the US will withdraw from the JCPOA in the next few days," Deputy foreign minister Araghchi was quoted as saying by the state news agency IRNA.

"The international community must be ready for this development," Araghchi added, warning that such a decision would affect stability in the region. Trump is weighing whether the pact serves US security interests, while the other world powers that negotiated it - France, Germany, Britain, Russia and China - still strongly support it....

Source: <https://www.usnews.com>, 08 January 2018.

NUCLEAR SAFETY

UK

Financing and Managing Nuclear Energy Risks: The UK Model

Nuclear Power Plants (NPPs) have long lifetimes and low running costs, but they require high up-front capital expenses and a long planning and

construction time. This means the economics of NPPs are sensitive to the cost of financing and overruns, and project delays can be costly. Successful financing is a major challenge and typically requires significant government involvement.

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Traditionally, the costs of constructing and operating nuclear power plants were mostly passed on to electricity consumers in the form of regulated tariffs,

minimizing the risk to lenders, investors and operators of exposure to price fluctuation. This traditional approach characterized most pre-liberalization electricity markets, where many of the utilities were integrated monopolies combining generation, transmission, distribution and retail, and the level of government involvement in regulation

However, the market liberalization that started in the developed world in the 1990s has led to increased price and revenue uncertainty, causing reluctance among lenders and investors to commit the significant resources needed for NPP construction.

Stakeholders have come up with innovative approaches to risk sharing in nuclear power projects that aim to give additional assurance to potential lenders and reduce capital costs. These include reducing revenue volatility by guaranteeing electricity prices and providing various forms of government guarantees.

In an attempt to address this reluctance,

stakeholders have come up with innovative approaches to risk sharing in nuclear power projects that aim to give additional assurance to potential lenders and reduce capital costs. These include reducing revenue volatility by guaranteeing electricity prices and providing various forms of government guarantees.

Replacing Nuclear with Nuclear: Why the UK Model Matters: Around 20 percent of the UK's electricity supply today is produced by nuclear. Within the broader context of its Electricity Market Reform, the Government has decided to continue to rely on nuclear rather than only on gas or renewable energy sources, and is seeking to

replace its existing nuclear fleet.

Currently, developers have up to 11 reactors proposed or planned at six sites. The power plant at Hinkley Point C has already passed through several stages of the decision-making process and is expected to be commissioned in the early 2020s.

The UK model features three main mechanisms in support of nuclear: a price guarantee scheme known as contract for difference (CfD); a government guarantees scheme; and a mechanism for limiting investor exposure to the costs of disposing of higher activity waste, including spent nuclear fuel.

Contract for Difference: The CfD features a ratepayer-backed guaranteed price for electricity generated by low-carbon technologies. According to the terms of its CfD, Hinkley Point C, once operational, will be paid the difference (on a ‘per megawatt hour’ basis) between a ‘strike price’ (the electricity price that reflects the cost of investing in a particular low-carbon technology) and the ‘reference price’ — a measure of the average price for electricity in the UK market. When the average market price (the price that a generator such as Hinkley Point C might expect to receive directly from the sale of its electricity in the market) is lower than the strike price, the generator receives a ‘top up’ payment to make up the difference. When the average market price is higher than the strike price, the generator must pay back the difference.

“In the Hinkley Point C project, the CfD substantially mitigates the so-called ‘market risk’ faced by lenders and investors,” said Anurag Gupta, Director and Global Sector Head for Power Infrastructure and Corporate Finance at KPMG. This gives electricity generators greater certainty and stability of revenues by reducing their exposure to volatile wholesale prices, while protecting consumers from paying for higher than

necessary support costs when electricity prices are high.

“By creating greater certainty, investors and lenders are able to model the project, which in turn allows them to make more informed decisions,” explained Paul Murphy, Managing Director of Gowling WLG. “Furthermore, taking a 35-year tenure, as opposed to a classic 20-year tenure, facilitates further long-term equity investment as well as refinancing options.”

The UK Guarantees Scheme: The UK Guarantees Scheme (UKGS) is a mechanism developed by the UK Government to provide credit enhancement through debt guarantees. The scheme was introduced in 2010 with a budget of £40 billion in guarantees to be invested across a range of UK

The UK Guarantees Scheme (UKGS) is a mechanism developed by the UK Government to provide credit enhancement through debt guarantees. The scheme was introduced in 2010 with a budget of £40 billion in guarantees to be invested across a range of UK infrastructure categories.

infrastructure categories, including energy, transport and social infrastructure. Support from this scheme has been made available to the Hinkley Point C project (for up to £2 billion worth of debt).

“It is instructive that the UK Government has concluded, based on years of analysis, that even in a market that has a long history with civilian nuclear power, government support is still needed to facilitate nuclear power development,” Murphy commented.

Limiting Investor Exposure to the Costs of Disposing of Higher Activity Waste: One of the key issues associated with nuclear power is uncertainty with regard to the costs of disposing of higher activity waste, including spent nuclear fuel. The UK Government has put in place a mechanism to effectively cap such costs, thereby reducing operators’ exposure to the risk of cost escalation. The mechanism operates by setting an upper limit (or ‘cap’) on the ‘waste transfer price’ that an operator will have to pay in return for the UK Government taking ‘ownership’ of the higher level waste (and thus responsibility for its disposal).

“By effectively capping the ultimate waste transfer price, the UK Government has provided reassurance to potential investors regarding a very ‘difficult to quantify’ project risk,” explained Paul Warren, IAEA Senior Nuclear Engineer for Nuclear Power.

Source: <https://www.iaea.org>, 10 January 2018.

USA

CDC to Inform Public on Nuclear Safety Measures

With all the recent news stories about nuclear weapons – and the prospect of an intentional or accidental launch the US Centers for Disease Control and Prevention plan to educate the public on safety precautions they can take if such an unlikely event occurs. The CDC plans to hold an online briefing January 16, to inform the public about preparations that have been made on the federal, state and local levels.

The agency’s website stresses that a nuclear detonation, while unlikely, would have “devastating results,” and allow little time for protection against radiation. Nevertheless, knowing fundamental safety measures can alleviate some of the more devastating effects.

For example, “Despite the fear surrounding such an event, planning and preparation can lessen deaths and illness. For instance, most people don’t realize that sheltering in place for at least 24 hours is crucial to saving lives and reducing exposure to radiation,” the CDC says....

The webcast will feature input from Dan Sosin, the CDC’s deputy director and chief medical officer, plus radiation experts and emergency response officials. Members of the public can

submit questions for the discussion, or apply to attend the event in person, by contacting the CDC’s Grand Rounds team.

Source: <http://www.foxnews.com>, 06 January 2018.

NUCLEAR WASTE MANAGEMENT

CANADA

Eight New Buildings Planned at Kincardine Nuclear Waste Facility

2018 is looking to be a busy year for Ontario Power Generation’s waste management operations. Vice President of Nuclear Waste Management Morton says they have plans for either the design or construction of eight buildings at the Western Waste Management Facility on the Bruce Power site.

She says five buildings are planned to store low-or-intermediate level nuclear waste, an additional two buildings will be constructed for dry storage of used nuclear fuel from the Bruce Power reactors, as well as a waste processing building. She says the processing building will help divert some waste from permanent storage on the site.

“A building in which our low-level waste specifically, is sorted through so that we look for opportunities for either diversion of some of that waste, decontamination of some of that waste and some further processing,” says Morton. “So ultimately, we’re trying to reduce our environmental footprint.” Morton says the additional development at the Western Waste Management Facility is not as a result of delays in gaining approval for the planned deep geologic repository on the site, which is proposed to store low-and-

knowing fundamental safety measures can alleviate some of the more devastating effects. For example, “Despite the fear surrounding such an event, planning and preparation can lessen deaths and illness. For instance, most people don’t realize that sheltering in place for at least 24 hours is crucial to saving lives and reducing exposure to radiation

The additional development at the Western Waste Management Facility is not as a result of delays in gaining approval for the planned deep geologic repository on the site, which is proposed to store low-and-intermediate level nuclear waste nearly 700-metres below the surface.

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She says they remain committed to the DGR project, including fulfilling the latest request from federal environment minister Catherine McKenna, who asked OPG to update its cumulative effects projections to include impacts on local First Nations communities. Morton says they are also continuing positive dialogue with Saugeen Ojibway Nation, maintaining their commitment to only proceed with First Nations approval. ...

Source: <http://blackburnnews.com>, 08 January 2018.

SWITZERLAND

Swiss Nuclear Plant Plans Low Risk Radioactive Waste Facility

Switzerland's Mühleberg nuclear plant plans to build a facility to deal with 1,000 tonnes of light radioactive waste after it goes offline next year. Such treatment centres have been given the green light by a government proposal to update laws. The agency running the canton Bern plant told

Swiss public television that it wants to have the treatment facility up and running by 2025, and treating the radioactive waste for the following 30 years. But a spokesperson would not reveal how much it would cost, how big it would be or where it will be located.

Earlier this month, the government put forward proposals to consultation that would allow lighter radioactive waste to be disposed of in this way by the beginning of 2019. Currently, all waste must be buried in deep geological depositories. The proposals state that individual cantons must agree to the construction of waste treatment plants before they can be built.

In 2011, Switzerland decided to phase out nuclear power, which supply an average 35% of the country's electricity production, following the Fukushima disaster, but there is no clear timetable for decommissioning plants. In November, Swiss voters rejected an initiative that called for all of Switzerland's five nuclear reactors to be shut down no later than 45 years after they started operating.

Source: <https://www.swissinfo.ch>, 13 January 2018.



Centre for Air Power Studies

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