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OPINION – Garimella Subramaniam

More Nukes?

The implication of the 2018 Nuclear Posture Review (NPR) is worrying. A case to develop low-yield atomic bombs, largely in response to Russia and China’s advances over the years, forms the cornerstone of the Pentagon’s 2018 NPR, released this month. This represents a radical break from former President Barack Obama’s 2010 NPR, which envisaged a reduced role for atomic weapons in defence, except in “extreme circumstances”. The new NPR broadens “extreme circumstances” to mean responding to non-nuclear aggression on infrastructure and civilian population in the US and its allies with low-yield weapons.

The new NPR conveniently distances the US from any moral high ground, or the promise to eschew nuclear aggression against non-nuclear weapons states that complied with the non-proliferation regime. Instead, it seeks to capitalise on the trillion dollar modernisation of ageing US nuclear arsenal that Mr. Obama had agreed on in return for Republican backing of the 2010 New Strategic Arms Reduction Treaty between the US and Russia.

The new policy emphasis on low-yield weapons lends credence to the view that the renovation

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and upgrade of US nuclear arsenals is being seen as an excuse to build usable nukes. To that extent, it merely reflects the larger dynamics of the 21st century arms race among the superpowers to amass smaller and supposedly less destructive nuclear weapons. An instance is the Chinese flight-testing of a hypersonic glide vehicle, which can destroy missiles through sheer

impact of energy generated from this ultra-high speed warhead. The other is the growing perception in Western strategic communities that Russia is willing to use nuclear weapons to ward off retaliation in a conventional attack, under the

so-called “escalate to de-escalate” strategy. Moscow’s 2014 invasion of Ukraine has only deepened suspicions of Russian expansionism among European nations.

Conversely, US installations of ballistic missile defence in Poland and Romania, to counter missile threats from Iran, have never impressed Russian President Vladimir Putin. Russia is designing a long-range submarine-launched nuclear torpedo that could potentially unleash radioactive contamination across vast areas.

A legitimate concern for Russia is the continued expansion of the NATO, nearly three decades since the Cold War. The military bloc covers not just the nations of the erstwhile Eastern Bloc, but the Commonwealth of Independent States, carved out of the former Soviet Union.

Arms control experts have bemoaned the implication of the NPR as potentially blurring the distinction between conventional and nuclear conflict. Few expect a return soon to the sober discourse of the previous decade on arms control, given President Donald Trump’s combative tone against North Korea’s nuclear militarisation. However, the recent thaw in relations between Pyongyang and Seoul is a hopeful sign that a negotiated resolution of the nuclear imbroglio could be within reach.

Source: *The Hindu*, 13 February 2018.

OPINION – Ken Jimbo

Wanted: A US Nuclear Strategy Tailored to Asia

The US nuclear posture review (NPR) and the Ballistic Missile Defence Review, the main US policy guidance for nuclear deterrence and defence, are scheduled to be released in a few weeks. According to the pre-decisional version of the NPR, unexpectedly leaked to the US media in mid-January, it will most likely emphasize flexible,

adaptable and resilient nuclear capability for the defence of the US and allies given the dramatic deterioration of the strategic environment since the previous NPR took place in 2010.

While the report retains the long-term goal of eliminating nuclear weapons and importance of nuclear arms control, the main thrust of the NPR will be a departure from the major draw-down projection of strategic nuclear arms in the previous NPR, and bring the salience of nuclear domain back in the US security strategy. The key decisions of the new NPR will include sustaining and replacing the nuclear triad and nonstrategic nuclear capability, including a low-yield nuclear option. As for the declaratory policy, the new NPR will identify the role of US nuclear forces to deter nuclear

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attacks of any scale by potential adversaries and also extend to the deterrence of potential adversaries’ non-nuclear strategic aggression, and to limit damage if deterrence fails. To achieve such goals, the US will apply “a tailored and flexible approach to effectively deter across a spectrum of adversaries,

threats and contexts.”

The nuclear disarmament community, as a matter of course, will strongly condemn the NPR’s decisions, saying they will lower the threshold of nuclear use and cause disarray in global moves toward nuclear disarmament. However, given the rapid strategic deterioration in Northeast Asia in the nuclear realm, there are enough reasons why America’s top allies in Asia — Japan and South Korea — should strongly support the key directions of the NPR decisions.

The North Korea Challenge: Deterring North Korea has become more difficult as its nuclear weapons program has created wide-ranging strategic challenges. Its soon-to-be-ready intercontinental ballistic missile capability will raise allies’ doubts on US resolve to launch a nuclear counterstrike at

the expense of US homeland vulnerability — a classic case of de-coupling. Deterring North Korea in a crisis or during a conventional war will also become a difficult task. As North Korea's escalation control capacity is limited, given its inferiority in conventional forces, Pyongyang will encounter a "use or lose" strategic choice to carry out full-scale nuclear attacks in the early phase of a conflict.

On the contrary, if the US nuclear retaliatory options are perceived to not be credible, North Korea may even think that limited nuclear strikes will provide a coercive advantage for its survival strategy. These new sets of nuclear challenges — the classic de-coupling challenge, the "use or lose" perception and limited strike options — should be neutralized by the US enhanced nuclear response capability, missile defences and extended deterrence to allies. But these various scenarios require finely tuned flexible response options for the US. This is essentially why the precisely targeted low-yield nuclear counterforce strikes are important. In this vein, modifying submarine-launched ballistic missile warheads to provide a low-yield option and pursuing a modern nuclear-armed sea-launched cruise missile, together with development of the Long-Range Stand-Off cruise missile — all of which are suggested in the NPR draft — are particularly important to fill the exploitable gap in US deterrence in Northeast Asia.

China's Nuclear Strategy: While the pursuit of "strategic stability" with China mentioned in the 2010 NPR appears to be missing from the new NPR, Washington's desire to seek dialogue to enhance mutual understanding with Beijing on nuclear policy remains in existence. However, the new NPR deliberately raises alarms over the increasing practicality of China's nuclear forces since it concerns Beijing's potential perceptions to secure an advantage through the "limited use of its theatre nuclear capabilities or that of any nuclear

weapons."

Japan, too, is paying more attention to Chinese conventional military capability that creates an anti-access/area denial environment for US operational access to the region, and China's limited use of nuclear weapons within its escalation control strategy. In this regard, the NPR decision to "respond decisively to Chinese non-nuclear or nuclear aggression" through a range of graduated nuclear response options are of significant assurance value to allies in Asia.

Meanwhile, as China's strategic and theatre nuclear forces become more survivable and robust, de facto mutual vulnerability in US-China nuclear relations seems to prevail in the long run. This anticipated future reveals various forms of de-coupling in alliance relations: First, mutual vulnerability at the strategic level (US-China relations) will

not ensure regional stability in Asia (Japan-China relations).

Second, if the US tries to deny strategic stability with a potential increase of US homeland missile defence (ground-based interceptors), it will also incentivize China to focus on nuclear deterrence strategy in the region. Third, the US conventional operational access concept will also trigger China to use nonstrategic nuclear weapons in escalation control. As there are increasing difficulties in pursuing a "best mix" of deterrence and assurance in the region, the US needs constant updates and consultation with its allies regarding a tailored nuclear strategy in Asia beyond NPR 2018.

Source: <https://www.japantimes.co.jp>, 31 January 2018.

OPINION – Jim Green

We are Entering the Era of Nuclear Decommissioning

Nuclear power is in crisis as even the most strident nuclear enthusiasts acknowledge and it is likely that a new era is fast emerging. After a

growth spurt from the 1960s to the '90s, then 20 years of stagnation, the Era of Nuclear Decommissioning is upon us.

2017 was supposed to be a good year for nuclear power the peak of a mini-renaissance resulting from a large number of reactor construction starts in the three years before the Fukushima disaster. The WNA anticipated 19 reactor grid connections (start-ups) in 2017 but in fact there were only four start-ups (Chasnupp-4 in Pakistan; Fuqing-4, Yangjiang-4 and Tianwan-3 in China). The four start-ups were outnumbered by five permanent shut-downs

(Kori-1 in South Korea; Oskashamn-1 in Sweden; Gundremmingen-B in Germany; Ohi 1 and 2 in Japan). The WNA's estimate for reactor start-ups in 2017 was hopelessly wrong but, for what it's worth, here are the Association's projections for start-ups in the coming years: 2018 19: 30, 2020 21: 12, 2022 23: 9, 2024 25: 2.

Thus notwithstanding the low number of start-ups in 2017 the mini-renaissance that gathered steam in the three years before the Fukushima disaster probably has two or three years to run. Beyond that, it's near-impossible to see start-ups outpacing closures.

New nuclear capacity of 3.3 GW in 2017 was outweighed by lost capacity of 4.6 GW. Over the past 20 years, there has been modest growth (12.6%, 44 GW) in global nuclear power capacity if reactors currently in long-term outage are included. However, including those reactors in particular idle reactors in Japan, many of which will never restart in the count of 'operable' or

'operational' or 'operating' reactors is, as former WNA executive Steve Kidd states, "misleading" and "clearly ridiculous" *The World Nuclear Industry Status Report* (WNISR) excludes reactors

in long-term outage defined as reactors that produced zero power in the previous calendar year and in the first half of the current calendar year from its count of operating reactors. Thirty-six reactors are currently in long-term outage, 31 of them in Japan. Excluding reactors in long-term outage, the number of reactors has declined by 29 over the past 20 years, while capacity has grown by a negligible

1.4% (5 GW). Over the past decade, the reactor count is down by 34 and capacity is down by 9.5% (19 GW). The industry faces severe problems, not least the ageing of the global reactor fleet. The average age of the reactor fleet continues to rise, and by mid-2017 stood at 29.3 years; over half have operated for 31 years or more.

The International Energy Agency expects a "wave of retirements of ageing nuclear reactors" and an "unprecedented rate of decommissioning" almost 200 reactor shut-downs between 2014 and 2040. The IAEA anticipates 320 GW of retirements by 2050 in other words, there would

need to be an average of 10 reactor start-ups (10 GW) per year just to maintain current capacity. The industry will have to run hard just to stand still. Assuming the mini-renaissance doesn't continue to flop (as it did in 2017), an average of 10 or so start-ups from 2015 2020 is possible (there were 24 start-ups from 2015 17).

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construction starts would need to increase sharply and there is no likelihood of that eventuating there have only been seven construction starts in the past two years combined. The number of reactors under construction is slowly dropping. Using WNA figures, 71 reactors were under construction in January 2014 compared to 58 in January 2018. According to WNISR figures, the number is down from 67 to 52 over the same period. That trend seems certain to continue because of a sharp drop in reactor construction starts: 38 from 2008 2010 compared to 39 in the seven years from 2011 2017. Nuclear power accounted for 10.5% of global electricity generation in 2016 (presumably a little less now), well down from the historic peak of 17.5% in 1996. Renewables (24.5% of global generation) generate more than twice as much electricity as nuclear power (<10.5%) and the gap is growing rapidly. The International Energy Agency predicts renewable energy capacity growth of 43% (920 GW) from 2017 to 2022. Overall, the share of renewables in power generation will reach 30% in 2022 according to the IEA. By then, nuclear's share will be around 10% and renewables will be out-generating nuclear by a factor of three.

A Disastrous Year for the Nuclear Industry: 2017 was "all in all a disastrous year" for the nuclear power industry according to *Energy Post Weekly* editor Karel Beckman. Nuclear lobbyists issued any number of warnings about nuclear power's "rapidly accelerating crisis", a "crisis that threatens the death of nuclear energy in the West", "the crisis that the nuclear industry is presently facing in developed countries", the "ashes of today's dying industry", and noting that "the industry is on life support in the US and other developed economies". Lobbyists engaged each other in heated arguments over possible solutions to nuclear power's crisis in a nutshell,

The biggest disaster for the nuclear industry in 2017 was the bankruptcy filing of Westinghouse which also came close to bankrupting its parent company Toshiba and the decision to abandon two partially-built reactors in South Carolina after the expenditure of at least US\$9 billion. As of January 2018, both Westinghouse and Toshiba are still undergoing slow and painful restructuring processes.

some favour industry consolidation while others think innovation is essential, all of them think that taxpayer subsidies need to be massively increased, and none of them are interested in the tedious work of building public support by strengthening nuclear safety and regulatory standards, strengthening the safeguards system, etc.

One indication of the industry's desperation has been the recent willingness of industry bodies (such as the US Nuclear Energy Institute) and supporters (such as former US energy secretary Ernest Moniz) to openly acknowledge the connections between nuclear power and weapons, and using those connections as an argument for increased taxpayer subsidies for nuclear power and the broader 'civil' nuclear fuel cycle. The power/ weapons connections are also evident with Saudi Arabia's plan to introduce nuclear power and the regime's pursuit of a weapons capability.

The biggest disaster for the nuclear industry in 2017 was the bankruptcy filing of Westinghouse which also came close to bankrupting its parent company Toshiba and the decision to abandon two partially-built reactors in South Carolina after the expenditure of at least US\$9 billion. As of January 2018, both Westinghouse and Toshiba are still undergoing slow and painful restructuring processes, and both companies are firmly committed to exiting the reactor construction business (but not the nuclear industry altogether). Another alarming development for the nuclear industry was the slow-down in China. China Nuclear Engineering Corp, the country's leading nuclear construction firm, noted in early 2017 that the "Chinese nuclear industry has stepped into a declining cycle" because the "State Council approved very few new-build projects in the past years". There were no commercial reactor construction starts in China in 2017 (though work

began on one demonstration fast neutron reactor) and only two in 2016. The pace will pick up but it seems less and less likely that growth in China will make up for the decline in the rest of the world.

The legislated plan to reduce France's reliance on nuclear from 75% of electricity generation to 50% by 2025 seems unlikely to be realised but the government is resolved to steadily reduce reliance on nuclear in favour of renewables. French environment minister Nicolas Hulot said in November 2017 that the 50% figure will be reached between 2030 and 2035. France's nuclear industry is in its "worst situation ever", a former EDF director said in November 2016, and the situation has worsened since then.

There were plenty of other serious problems for nuclear power around the world in 2017:

- ◆ Swiss voters supported a nuclear phase-out referendum.
- ◆ South Korea's new government will halt plans to build new nuclear power plants (though construction of two partially-built reactors will proceed, and South Korea will still bid for reactor projects overseas).
- ◆ Taiwan's Cabinet reiterated the government's resolve to phase out nuclear power by 2025 though a long battle
- ◆ Japan's nuclear industry has been decimated just five reactors are operating (less than one-tenth of the pre-Fukushima fleet) and 14 reactors have been permanently shut-down since the Fukushima disaster (including the six Fukushima Daiichi reactors).
- ◆ India's nuclear industry keeps promising the world and delivering very little nuclear capacity is just 6.2 GW. In May 2017, India's Cabinet approved a plan to build 10 indigenous pressurised

heavy water reactors, but most have been in the pipeline for years and it's anyone's guess how many (if any) will actually be built.

◆ The UK's nuclear power program faces "something of a crisis" according to an industry lobbyist. The reactor fleet is ageing but only two new reactors are under construction. The estimated cost of the two Hinkley Point reactors, including finance, is A\$40 billion.

◆ All of Germany's reactors will be closed by the end of 2022 and all of Belgium's will be closed by the end of 2025.

◆ Russia's Rosatom began construction of the first nuclear power reactor in Bangladesh, signed agreements to build Egypt's first power reactors, and is set to begin work

on Turkey's first reactors but Rosatom deputy general director Vyacheslav Pershukov said in June 2017 that the possibilities for building new large reactors abroad are almost exhausted. He said Rosatom expects to be able to find customers for new reactors until 2020 2025 but "it will be hard to continue."

◆ A High Court judgement in South Africa in April 2017 ruled that much of the country's nuclear new-build program is without legal foundation, and there is little likelihood that the program will be revived given that it is shrouded in corruption scandals and President Jacob Zuma's hold on power is weakening.

The only nuclear industry that is booming is decommissioning the World Nuclear Association anticipates US\$111 billion worth of decommissioning projects to 2035.

The Era of Nuclear Decommissioning: The ageing of the global reactor fleet isn't yet a crisis for the industry, but it is heading that way. In many countries with nuclear power, the prospects for new reactors are dim and rear-guard battles are

The ageing of the global reactor fleet isn't yet a crisis for the industry, but it is heading that way. In many countries with nuclear power, the prospects for new reactors are dim and rear-guard battles are being fought to extend the lifespans of ageing reactors that are approaching or past their design date. Perhaps the best characterisation of the global nuclear industry is that a new era is approaching the Era of Nuclear Decommissioning.

being fought to extend the lifespans of ageing reactors that are approaching or past their design date. Perhaps the best characterisation of the global nuclear industry is that a new era is approaching the Era of Nuclear Decommissioning following on from its growth spurt from the 1960s to the '90s then 20 years of stagnation.

The Era of Nuclear Decommissioning will entail:

- ◆ A slow decline in the number of operating reactors.
- ◆ An increasingly unreliable and accident-prone reactor fleet as ageing sets in.
- ◆ Countless battles over lifespan extensions for ageing reactors.
- ◆ An internationalisation of anti-nuclear opposition as neighbouring countries object to the continued operation of ageing reactors (international opposition to Belgium's ageing reactors is a case in point and there are numerous other examples).
- ◆ Battles over and problems with decommissioning projects (e.g. the UK government's £100+ million settlement over a botched decommissioning tendering process).
- ◆ Battles over taxpayer bailout proposals for companies and utilities that haven't set aside adequate funds for decommissioning and nuclear waste management and disposal. (According to Nuclear Energy Insider, European nuclear utilities face "significant and urgent challenges" with over a third of the continent's nuclear plants to be shut down by 2025, and utilities facing a •118 billion shortfall in decommissioning and waste management funds.)
- ◆ Battles over proposals to impose nuclear waste repositories and stores on unwilling or divided communities.

The Era of Nuclear Decommissioning will be characterised by escalating battles (and

escalating sticker shock) over lifespan extensions, decommissioning and nuclear waste management. In those circumstances, it will become even more difficult than it currently is for the industry to pursue new reactor projects. A feedback loop could take hold and then the nuclear industry will be well and truly in crisis if it isn't already.

Source: <http://www.theenergycollective.com>, 31 January 2018.

OPINION – John M. Crisp

The Inevitable Nuclear War

We don't do enough thinking about catastrophe, so let's pause to note that everything on our national political stage – tax reform, immigration, health care, the Mueller investigation – and in our private lives, for that matter, occurs against two apocalyptic backdrops: climate change and nuclear war.

We got used to the idea and settled into a grim nuclear standoff with other nuclear nations; the notion of nuclear annihilation became as abstract and distant – and as easily ignorable – as climate change.

That's too much to think about in 700 words, so let's allow climate change to simmer on the back burner for a while. Despite already catastrophic effects, we're doing very little about it, anyway; on the contrary, we've elected national leadership that doesn't take it seriously. So let's consider instead the possibility of nuclear war:

The 1962 Cuban Missile Crisis got our attention, and for a decade or two we lived with the reality that nuclear destruction was as few as 30 minutes away. We built fallout shelters, studied ways to protect ourselves from radiation and held civil defense drills. Then we got used to the idea and settled into a grim nuclear standoff with other nuclear nations; the notion of nuclear annihilation became as abstract and distant – and as easily ignorable – as climate change.

We even made successful efforts at limiting nuclear proliferation and at reducing standing nuclear arsenals. But with Iran, North Korea and a US president more inclined toward belligerence than diplomacy, things have changed: nuclear is

back. Current conditions are reminiscent of the world of 1913, just prior to the start of the First World War:

The Great War didn't have a proximate cause, and historians still puzzle over why it happened at all. How could such a cataclysmic world-wide event be triggered by an isolated assassination in Sarajevo in 1914? The answer resides in the tensions and rivalries among the great international powers of the day and in their response to them, which was to prepare for war. For example, in 1900 Germany decided to build a fleet to match Britain's Royal Navy, and by 1906 a full-fledged race for battleship superiority was underway.

Similarly, France extended the terms of service of its conscripts in order to match the size of Germany's growing army. In short, by 1913 armies and weapons had taken on a life of their own that threatened the power of national leaders and diplomats to control them. Because the European powers were so well prepared for war, war had become almost inevitable. The assassination of Archduke Ferdinand was merely the incidental trigger that ignited the conflagration.

Further, in 1913 war was a matter of horses and swords and single-shot, bolt-action rifles. Certainly, soldiers got hurt and many died, but Europe didn't have the collective imagination to envision the devastation of a modern war fought with modern weapons. Few could have predicted 40 million casualties in just four years.

We suffer from both of these conditions today: We've never really absorbed the stark lessons of Hiroshima and Nagasaki, and we've failed to

extrapolate the devastation of the two comparatively modest nuclear weapons discharged in 1945 to a significant exchange of today's much more powerful weapons. Because the aftermath of a real nuclear war is unthinkable, we've largely refused to think about it.

Further, the weapons themselves threaten our capacity to control them. Nuclear weapons are precarious, as indicated by the recent panic in Honolulu when a defense drill got out of hand. And while we might hope that the use of nuclear weapons could be constrained by rationality, somehow in our country we've allowed the so-called nuclear football to fall into the hands of a man who is characterized by emotion, insecurity, impulse and bluster. And then there's Kim Jong-un.

One other factor works against us, just as it did in 1913: Next year's Pentagon budget will be \$716 billion, the largest ever. Weapons demand to be used. We've never invented a weapon that we've declined to use. All of this implies that a nuclear war is inevitable, and the ensuing calamity will be unimaginable. The only silver lining is that the devastation of climate change will fade into insignificance.

Source: <http://napavalleyregister.com>, 13 February 2018.

OPINION – Maxim Starchak

Russia's Contradictory and Inconsequential Policies on Nuclear Non-Proliferation and Arms Control

Russia, one of the world's two largest nuclear powers, pursued internally contradictory and frequently inconsequential policies during 2017 when it came to questions of limiting further

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Russia, one of the world's two largest nuclear powers, pursued internally contradictory and frequently inconsequential policies during 2017 when it came to questions of limiting further proliferation of these weapons or preserving important arms control treaties with the US. And these policies can be expected to continue this year.

proliferation of these weapons or preserving important arms control treaties with the US. And these policies can be expected to continue this year. International tensions over the DPRK—North Korea’s nuclear program was quite acute in 2017, and may even further escalate in 2018. However, Moscow was largely inconsequential when it came to resolving this issue. For instance, in May 2017, the Russian Ministry of Foreign Affairs expressed regret that the DPRK had conducted another nuclear test. But still, Moscow continued to justify North Korea’s nuclear program as a reaction to military activity by some regional countries and the US. Moreover, although Russia voted for additional sanctions on the DPRK at the UNSC each time they were introduced, the Kremlin nonetheless repeatedly publicly attacked the sanctions regime as detrimental.

Russia can be expected to remain similarly inactive when it comes to reining in the DPRK’s nuclear program during 2018. Moscow is interested in a divided Korean peninsula, since a united Korea could mean a US military ally on Russia’s south-eastern border. For now, the DPRK remains a useful and advantageous buffer. Russia supports the sanctions only because of its close strategic relationship with the PRC, which, in league with the US, has backed increasing sanctions on North Korea over the course of 2017. For Moscow, maintaining close relations with Beijing is important both to try to withstand Western sanctions on Russia and because Russia does not have any other allies in the region.

Regarding Iran, which has not yet developed a nuclear weapon, Russia is a member of the six-party talks on Tehran’s nuclear program, which culminated in 2015 with the signing and adoption of the JCPOA. Contrary to the rhetoric coming from the White House, Russia believes that Iran is sticking to its commitments under the JCPOA.... As such, Moscow has ruled out the possibility of

amending the agreement or reinstating nuclear program–linked sanctions on Tehran. However, this unconditional support for Iran puts Russia at big risk. If the JCPOA ends up being scrapped because one of its parties withdraws or pushes for unacceptable changes to the agreement, Russia will lose another foreign policy success story it can point to. If Iran quits the agreement, Moscow’s ability to exert influence over Tehran will look extremely weak. Perhaps even more importantly, the sudden increased international pressure on Tehran after the collapse of the JCPOA could undermine Iran’s ability to continue to project power into Syria, where Russia relies on Iranian and Shiite proxy militias for boots on the ground.

In December 2017, US Secretary of State Rex Tillerson reported that, in 2018, Washington and Moscow are planning to hold “important negotiations” on two key bilateral arms control treaties—New START and the 1988 INF Treaty. But in 2017, Putin openly declared his negative perception of these agreements, neither of which were signed by him (New START was signed by then-president Dmitry Medvedev, while Putin served as prime minister.

If Iran quits the agreement, Moscow’s ability to exert influence over Tehran will look extremely weak. Perhaps even more importantly, the sudden increased international pressure on Tehran after the collapse of the JCPOA could undermine Iran’s ability to continue to project power into Syria, where Russia relies on Iranian and Shiite proxy militias for boots on the ground.

The Kremlin leader also criticized the Megatons to Megawatts Program, which allows the US to conduct unrestricted inspections of Russian nuclear enterprises. Additionally, Putin expressed doubts about New START. In particular, he complained of various missile types (missile-defence interceptors and sea-based medium-range missiles) left outside the scope of the treaty that, he claimed, can too easily be converted into delivery vehicles that should be counted under the arms control regime. Additionally, the Russian foreign ministry is apparently not satisfied with the bilateral format of further nuclear disarmament talks. Over the coming months, Moscow will likely continue to push for the inclusion of outside powers, including members of the NATO, into any

future negotiations with the United States on the reduction of strategic nuclear weapons and missile defence as well.

However, negotiations on the extension of New START for another five years after 2021 will probably not fall off the agenda. In late 2017, the US administration finally confirmed that the Russian missile Washington alleges is in violation of the INF Treaty is the Novator 9M729 GLCM. It is unlikely that this particular missile will be produced massively or that it will take a leading position in Russia's nuclear strategy. Most likely, the open secret of the 9M729 GLCM was meant to push the US to unilaterally withdraw from the INF Treaty in response, thus leaving Russia free to quickly begin producing and adding other medium-range nuclear-capable missiles to its arsenal. Russian counter-

accusations of the US violating the INF pursue the same goal. Allegations that the US is beginning to conduct research into the creation of its own medium-range ground-based missiles would only work to Russia's benefit because it gives Moscow reason to criticize the US while, at the same time, providing internal justification for Russia's own INF Treaty violations. Nevertheless, Moscow is highly unlikely to make the first move to unilaterally withdraw from the INF Treaty.

Russia has been critical of the President Trump administration's new Nuclear Posture Review, a pre-decisional draft of which was leaked earlier in January 2018. In particular, Moscow has balked at the point in the draft NPR that the US is apparently going to develop new sea-based low yield nuclear warheads. Publicly at least, Russia has long considered the development of low-yield nuclear weapons a dangerous phenomenon that would lead to a potential reduction in the threshold for their use. The Federation Council

(upper chamber of the Russian parliament) asserted several weeks ago that the new US nuclear strategy poses a threat to the world. Yet, at the same time, Russia is apparently developing its own "clean" low-yield weapons and modernizing its tactical nuclear arsenal.

In fact, the increasing role of nuclear weapons as part of Trump's defence strategy will give Russia confidence that its development of low-yield nuclear weapons and medium-range missiles is correct and should be continued in 2018. In 2017, the attitude of Russia, and in particular President Putin, to the nuclear agreements he did not sign could be characterized as neutral passive. In other words, they will be kept formally, but Russia could choose to revise them or conclude new ones only under terms that are impossible in principle. Russia is

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preparing for the collapse of the arms control regime, and it is not interested in new agreements in the nuclear sphere that would limit its production of new nuclear weapon types. Thus, looking ahead to 2018, Russia is unlikely to play a constructive role in various nuclear arms control negotiations, even as it accuses the United States of the same intransigence.

Source: <https://jamestown.org>, 31 January 2018.

NUCLEAR STRATEGY

CHINA

China Must Strengthen Nuclear Deterrence and Counter-strike Capabilities

China must strengthen its nuclear deterrence and counter-strike capabilities to keep pace with the developing nuclear strategies of the United States and Russia, the official paper of the PLA said on 30 January, 2018. US President Trump's administration may be pursuing the development

of new nuclear weaponry and could explicitly leave open the possibility of nuclear retaliation for major non-nuclear attacks, according to a draft of a pending Nuclear Posture Review leaked by the Huffington Post.

This “unprecedented” move by the US, combined with continuous quality

improvements of nuclear arsenals in both the US and Russia, means that both countries place greater importance on deterrence and real combat usability, the commentary in the PLA Daily said.

“In the roiling unpredictability of today’s world, to upgrade the capability of our country’s deterrence strategy, to support our great power position...we must strengthen the reliability and trustworthiness of our nuclear deterrence and nuclear counterstrike capabilities,” it said....A change was necessary despite China having developed nuclear weapons to avoid bullying from nuclear powers, the paper said, adding that China would always stick to the principle of “no first use” and a final goal of eliminating nuclear weapons.

Neither Russia nor the US is abandoning nuclear weapons as each adopts new high-tech weapons capabilities, the paper said, pointing to the US Congressional Budget Office’s estimate of maintenance and modernisation of the US

nuclear arsenal over the next 30 years costing more than \$1.2 trillion. This spend has led to a corresponding Russian military modernisation program, aiming to boost the share of advanced armaments in its nuclear triad to at least 90 percent by 2021. Chinese President Xi Jinping is overseeing an ambitious military modernisation programme, including developing advanced nuclear-capable missiles. China carried out its first nuclear weapons test only in 1964. Trump’s strong

A change was necessary despite China having developed nuclear weapons to avoid bullying from nuclear powers, the paper said, adding that China would always stick to the principle of “no first use” and a final goal of eliminating nuclear weapons. Neither Russia nor the US is abandoning nuclear weapons as each adopts new high-tech weapons capabilities.

China has urged the US to drop its “Cold War mentality” after Washington said it planned to diversify its nuclear armoury with smaller bombs. “The country that owns the world’s largest nuclear arsenal, should take the initiative to follow the trend instead of going against it,” China’s defence ministry said on 4 February.

embrace of his predecessor President Obama’s nuclear modernisation programme has led some former senior US government officials, legislators and arms control specialists to warn of risks from the US stoking a new arms race. A US national defence strategy released on Jan. 19 shifted priorities to put what

Defence Secretary Jim Mattis called a “great power competition” with China and Russia at the heart of the country’s military strategy.

Source: <http://www.news18.com>, 30 January 2018.

USA

China Accuses US of ‘Cold War Mentality’ over Nuclear Policy

China has urged the US to drop its “Cold War mentality” after Washington said it planned to diversify its nuclear armoury with smaller bombs. “The country that owns the world’s largest nuclear arsenal, should take the initiative to follow the trend instead of going against it,” China’s defence ministry said on 4 February.

The US military believes its nuclear weapons are seen as too big to be used and wants to develop low-yield bombs. Russia has already condemned the plan. Iran’s foreign minister claimed it

brought the world “closer to annihilation”.

What is the New US Policy? The US is concerned about its nuclear arsenal becoming obsolete and no longer an effective deterrent. It names China, Russia, North Korea and Iran as potential threats.

Where are the World’s Nuclear Weapons? The Pentagon document released on 2 February, known as the Nuclear Posture Review (NPR), argues that developing smaller nuclear weapons

would challenge that assumption. Low-yield weapons with a strength of under 20 kilotons are less powerful but are still devastating. The policy also proposes: Land-based ballistic missiles, submarine-launched missiles, and air-delivered weapons - to be extensively modernised, as begun under ex-President Obama, Proposed modification of some submarine-launched nuclear warheads to give a lower-yield or less powerful detonation, Return of sea-based nuclear cruise missiles. Countering the “growing threat from revisionist powers”, such as China and Russia, was at the heart of America’s new defence strategy announced last month (January).

What did China Say? China said on 4 February it “firmly” opposed the Pentagon’s review of US nuclear policy. The defence ministry in Beijing said Washington had played up the threat of China’s nuclear threat, adding that its own policy was defensive in nature. “We hope that the United States will abandon its Cold War mentality, earnestly assume its special disarmament responsibilities, correctly understand China’s strategic intentions and objectively view China’s national defence and military build-up,” its statement said.

China has used the Cold War label before to criticise US policy. Late last year it denounced Washington’s updated defence strategy and urged the US to abandon “outdated notions”. In the NPR document, the US accused China of “expanding its already considerable nuclear forces” but China defended its policy on Sunday saying it would “resolutely stick to peaceful development and pursue a national defence policy that is defensive in nature”.

How did others React? The Russian foreign ministry accused the US of warmongering, and said it would take “necessary measures” to ensure Russian security. “From first reading, the confrontational and anti-Russian character of this

document leaps out at you,” it said in a statement on 3 February. FM Sergei Lavrov expressed “deep disappointment” at the plan. Iranian Foreign Minister Mohammad Javad Zarif argued the proposals were in violation of the international nuclear non-proliferation treaty.

Source: <http://www.bbc.com>, 04 February 2018.

Trump NPR Overstates China’s Nuclear Arsenal Modernization Plans

A leaked draft of the Trump administration’s Nuclear Posture Review (NPR) misrepresents the status of China’s nuclear forces, according to a white paper released by the Union of Concerned Scientists. “China has made slow but steady incremental improvements to its nuclear arsenal,” says paper author Gregory Kulacki, China Project manager at the UCS Global Security Program. “But the gap between China and the United States is too wide to argue that the United States is lagging behind in any meaningful way. In fact, the exact opposite is

The US arsenal of 4,480 active and reserve nuclear warheads is more than 10 times the size of the Chinese arsenal; The United States has 400 ground-based intercontinental ballistic missiles, at least four times more than China’s 75 to 100 ICBMs; and 12 US nuclear-capable submarines currently carry 900 warheads while China’s four ballistic missile submarines carry none.

true. By any measure, the US arsenal is far superior.”

Regardless, the leaked NPR draft erroneously states that the United States needs new nuclear weapons because “China is expanding and modernizing its considerable nuclear forces” and is pursuing “entirely new nuclear capabilities.”

Among other things, the paper points out that:

- The US arsenal of 4,480 active and reserve nuclear warheads is more than 10 times the size of the Chinese arsenal;
- The United States has 400 ground-based intercontinental ballistic missiles, at least four times more than China’s 75 to 100 ICBMs; and
- 12 US nuclear-capable submarines currently carry 900 warheads while China’s four ballistic missile submarines carry none.

“There is no evidence that nuclear weapons are becoming more prominent in China’s military strategy or that China has changed its longstanding no-first-use policy,” says Kulacki. “Chinese military sources emphatically state that China’s only security objective with its relatively small nuclear force is to retain the ability to retaliate in the event of a nuclear attack.

“If the Trump administration were truly concerned about limiting the size and capability of China’s nuclear forces,” he added, “it would ratify the Comprehensive Test Ban Treaty, which China signed in 1996, and negotiate a fissile material control treaty, which China supports. Doing so would cap the size of China’s nuclear arsenal.”

Source: <https://www.ucsusa.org>, 01 February 2018.

BALLISTIC MISSILE DEFENCE

INDIA

India Successfully Test-Fires Short Range Nuclear Capable Ballistic Missile Agni-I

India on 06 February, 2018 successfully test-fired its short-range nuclear capable ballistic missile Agni-I with a strike range of over 700 km. The missile test was done from a test range off the Odisha coast, defence sources said. The indigenously developed surface-to-surface missile was launched as a part of a periodic training activity by the Strategic Forces Command or SFC of the Indian Army to consolidate operational readiness....

The state-of-the-art missile was launched at around 8:30 am from a mobile launcher at Pad 4 of the Integrated Test Range at the Dr Abdul Kalam Island.... Describing the trial as a “complete success”, they said that all the mission objectives were met during the test.”The trajectory of the trial was tracked by a battery of sophisticated radars, telemetry observation stations, electro-optic instruments and naval ships right from its launch till the missile hit the target area with pin point accuracy,” the sources confirmed.

The sophisticated Agni-I missile is propelled by a solid rocket propellant system and is equipped

with a specialised navigation system that ensures it reaches the target with a high degree of precision, they said. The missile, which has already been inducted into the armed forces, has proved its performance in terms of range, accuracy and lethality, the sources said.

Weighing around 12 tonnes, the 15-metre-long Agni-I can carry payloads up to 1,000 kg and is capable of hitting a target beyond 700 km. The missile is also capable of carrying nuclear warheads. The Agni-I was developed by the Advanced Systems Laboratory or ASL in collaboration with the DRDL and the Research Centre Imarat (RCI). The missile was integrated by the Bharat Dynamics Limited, Hyderabad. The Advanced Systems Laboratory is the premier missile development laboratory of the DRDO.

Source: <https://www.ndtv.com>, 06 February 2018.

RUSSIA

Russia Deploying Ballistic Missiles to Baltic Enclave

Lithuania has accused Russia of deploying nuclear-capable ballistic missiles to its Kaliningrad exclave on the Baltic, on 5 February, as relations between Moscow and the West sink to post-Cold War lows. Russia has previously sent Iskander missiles to Kaliningrad for drills, but Lithuanian President Grybauskaitė said that this time they were being deployed for a ‘permanent presence’. Speaking to reporters, Grybauskaitė warned that the deployment in the Russian region bordering Baltic NATO members Poland and Lithuania posed a danger for ‘half’ of Europe’s capitals. Moscow was reported to have deployed Iskander missiles for exercises in its Kaliningrad exclave in 2016, rattling nearby NATO members. Lithuanian intelligence agencies said...that a permanent, nuclear-capable Iskander deployment was ‘inevitable’, adding that Moscow will likely ‘present it as a response to NATO actions’.

In 2017, NATO deployed four multinational battalions to Poland and the Baltic states as tripwires against possible Russian adventurism, while the US military sent a Patriot battery to Lithuania for drills. US Vice President Mike Pence

in July 2017 also raised the possibility of deploying the Patriot anti-missile defence system in nearby Estonia. The Baltic states hope NATO will agree on additional air defence capabilities for the region during a Brussels summit in July 2018. The US is meanwhile in the process of selling nearby Poland a Patriot anti-missile system, a move likely to irk Russia. The US Department of State said in November 2017 that it had notified Congress of its approval of the deal, worth up to \$10.5 billion, marking the first time Poland has bought the sophisticated system. The Patriot is a mobile air-defence system designed to intercept tactical ballistic missiles, low-flying cruise missiles and aircraft.

Source: <https://www.shephardmedia.com>, 05 February 2018.

USA

US Military Carries out Unsuccessful Missile Defence Test

The US military carried out an unsuccessful test to shoot down an incoming dummy missile from Hawaii, a US official said, amid heightened concerns about North Korea's developing missile and nuclear program. The official, speaking on the condition of anonymity, said a SM-3 Block IIA missile was launched from an Aegis Ashore test site in Hawaii, but failed to hit another missile launched from an aircraft. It was unclear why the test failed and an analysis was underway, the official said. The missile, which is being developed by Raytheon Co, is used to target intermediate range missiles and is being developed with Japan. The Missile Defence Agency did not comment on the outcome of the test, but confirmed that one had taken place.

"The Missile Defense Agency and US Navy sailors

The Baltic states hope NATO will agree on additional air defence capabilities for the region during a Brussels summit in July 2018. The US is meanwhile in the process of selling nearby Poland a Patriot anti-missile system, a move likely to irk Russia.

manning the Aegis Ashore Missile Defense Test Complex (AAMDTC) conducted a live-fire missile flight test using a Standard-Missile (SM)-3 Block IIA missile launched from the Pacific Missile Range Facility, Kauai, Hawaii, on 31 January, 2018...."

An intercept test for the missile last June also failed, but there was a successful test in early 2017. Year 2017 has seen ramped-up North Korean missile launches, some of

them over Japanese territory, and its sixth and most powerful nuclear test. These actions have prompted a stepped-up US-led campaign to toughen UN sanctions, which Pyongyang has called an act of war. Branding North Korea's leadership "depraved," President Donald Trump told Americans on 30 January that Pyongyang's pursuit of nuclear missiles could "very soon threaten our homeland" and vowed a continued campaign of maximum pressure to keep that from happening.

In his first State of the Union speech to the US Congress, Trump's tough rhetoric underscored persistent tensions despite recent talks between North and South Korea that led to Pyongyang's agreement to participate in next month's Winter Olympic games hosted by Seoul. Earlier in 2018, the US government approved the sale of the anti-

The State Department asked Congress to approve the \$133-million sale of the four missiles and related hardware, which can be launched from destroyers at sea or from a land-based system. Japan formally decided in December that it would expand its ballistic missile defence system with US-made ground-based Aegis radar stations and interceptors.

ballistic missiles to Japan to help defend itself against a growing North Korean threat. The State Department asked Congress to approve the \$133-million sale of the four missiles and related hardware, which can be launched from destroyers at sea or from a land-based system. Japan formally decided in December that it would expand its ballistic

missile defence system with US-made ground-based Aegis radar stations and interceptors.

Source: <https://www.theglobeandmail.com>, 31 January 2018.

NUCLEAR ENERGY

SAUDI ARABIA

How Saudi Arabia Can Go Nuclear (But Prevent Proliferation)

Renewed interest in nuclear cooperation between the US and the Kingdom of Saudi Arabia (KSA) has relaunched debate over whether Washington should insist upon a legally binding “gold standard” commitment from the KSA that forecloses Saudi deployment of sensitive nuclear fuel cycle technology. The KSA aims to eventually enrich uranium itself. Riyadh might mine its own uranium, but without any enrichment infrastructure currently, where would it obtain enough help to enrich uranium for power reactor fuel?

Every country that has developed enrichment technology for that purpose belongs to the Nuclear Suppliers Group (NSG), the world’s most important nuclear export control body. Its guidelines on sensitive transfers contain red lines and urge states to exercise restraint. These guidelines today also inform decision-making by Israel, India, and—notably—Pakistan, a state frequently cited by some observers as likely to divert nuclear know-how to Riyadh.

What the NSG Rules Say: In response to 9/11 attacks, and to proliferation of Pakistan’s nuclear technology, in 2011 the NSG specified conditions that countries must meet to receive sensitive transfers. Henceforth, a recipient must be a party to the NPT, comply with a comprehensive safeguards agreement with the IAEA, not be subject to suppliers’ denial notifications, implement United Nations Security Council resolution commitments to prevent proliferation, and not be subject to IAEA resolutions seeking demonstration that nuclear activities are peaceful. The guidelines also urge suppliers to forbid retransfer, replication, and sharing of sensitive technology, and to commit recipients to limit enrichment levels, provide for

adequate physical protection, and apply IAEA safeguards in perpetuity. Beyond that, the NSG counsels suppliers to authorize transfers only when they are satisfied that the transfers will not contribute to nuclear weapons proliferation or nuclear terrorism.

The KSA is an NPT party, has a comprehensive safeguards agreement, and the IAEA has concluded that Riyadh’s few declared nuclear materials are used peacefully. But, the IAEA has not confirmed absence of undeclared nuclear activities in the KSA, and the IAEA cannot do this unless Riyadh adopts the IAEA Additional Protocol giving inspectors greater access. The KSA would not, therefore, be explicitly disqualified by NSG rules from obtaining sensitive technology from

Islamabad might in the future provide Riyadh with nuclear weapons under a previously concluded secret pact. In light of the above regional background, to suggest that NSG governments are wary of Pakistan-Saudi nuclear commerce would be an understatement. Pakistan is enriching uranium, separating plutonium and building nuclear weapons using these materials.

its members; the decision to transfer these would be a judgment call by supplier states. But without Riyadh demonstrating an effective non-proliferation track record, including export controls and IAEA verification (including through an Additional Protocol), no responsible supplier state would agree to transfer enrichment or reprocessing items to the KSA. Suppliers would consider the region’s legacy of conflict, as well as nuclear, missile, and chemical weapon proliferation, along with Riyadh’s bitter rivalry with Tehran. NSG members know that Saudi officials have justified their interest in enrichment, referencing Iran’s nuclear build-up and absence of a nuclear weapons-free zone in the Middle East.

Pakistan, the KSA and the NSG: Media reports are peppered with unconfirmed assertions of past interactions between the KSA and Pakistan, including concerning matters of Pakistan’s nuclear development. These include allegations that the KSA funded Pakistan’s nuclear program, that a KSA defence minister met with Pakistani nuclear physicist A.Q. Khan two decades ago, and that Islamabad might in the future provide Riyadh with nuclear weapons under a previously

concluded secret pact. In light of the above regional background, to suggest that NSG governments are wary of Pakistan-Saudi nuclear commerce would be an understatement. Pakistan is enriching uranium, separating plutonium and building nuclear weapons using these materials. Pakistan is not an NPT party and thus not obligated by it to restrict its nuclear commerce with other states. Pakistan's past failure to protect its nuclear assets might encourage the KSA and others to seek enrichment or reprocessing assistance from Pakistan. But, the NSG guidelines should dissuade Pakistan from aiding the KSA. In 2016, Pakistan notified the NSG that it is implementing the group's guidelines. Pakistani officials say that this means that Pakistan will not transfer enrichment and reprocessing items to the KSA. Islamabad's own updated rules state that "there is a strong presumption of denial in case of enrichment and reprocessing technologies."

Pakistan took these steps in the course of five years of enhanced engagement with the NSG. In 2010, the United States announced that it would support India's bid for NSG membership. The aim of Pakistan's accelerated outreach was to ensure that any conversation in the NSG about Indian membership would also include consideration of Pakistan. Islamabad established a program to implement the NSG guidelines as part of its effort to rehabilitate its image and its non-proliferation practices after A.Q. Khan's activities were exposed in 2004. Today, NSG members are considering membership for both Pakistan and India for at least one very compelling reason: to encourage states with sensitive nuclear technologies to implement the NSG guidelines, thereby contributing toward the NSG's effectiveness.

In theory, Pakistan in the future could change its policy and not implement NSG guidelines. In practice, the potential that Pakistan might in future not implement the guidelines could be viewed as a form of Pakistani leverage to gain membership. That might also imply that a future NSG decision not to admit Islamabad would run the risk that Pakistan may again proliferate. But any future confirmation by suppliers of undisclosed, sensitive Pakistan-KSA nuclear cooperation might disqualify Pakistan for NSG membership on grounds, expressed by the NSG's outreach documents, that

an important condition is "enforcement of a legally based domestic export control system that gives effect to the commitment to act in accordance with the guidelines." A breach of the guidelines by Pakistan or any NSG member would not carry penalties since states' adherence is voluntary. But, powerful suppliers would likely bring the matter into the UN Security Council; without effective resolution by Islamabad and Riyadh, punitive sanctions against both states might follow.

Policy Implications: The NSG guidelines reduce the risk that the KSA will enrich uranium or separate plutonium. Riyadh's interest in acquiring enrichment technology underlines the NSG's aim to have both India and Pakistan inside the tent. This outcome might be encouraged by a recent trend toward geopolitical opportunism among powerful supplier states concerning membership: If China and its ally Pakistan do not want India alone to be admitted to the NSG and to the Security Council as a permanent member, they should make sure that Pakistan's sensitive nuclear assets do not find their way to the KSA (or elsewhere).

On this basis, for the US to insist that the KSA legally ban enrichment and reprocessing as a condition of nuclear cooperation might be counterproductive to US non-proliferation objectives, especially if Riyadh will not agree to it. Implementation of the NSG guidelines by all members plus India, Israel, and Pakistan, would imply that Riyadh would have just one possible partner to develop an enrichment infrastructure: North Korea. Were US-KSA nuclear cooperation to require Riyadh having an Additional Protocol but not having to legally foreclose future nuclear fuel cycle options, the United States would be in an enhanced position to engage the KSA over its fuel cycle future as well as over any willingness by the KSA to assume the national security risks and consequences that would follow from nuclear cooperation with Pyongyang. This US approach would also be fitting should Riyadh not aim to quickly establish fuel cycle capabilities but instead proceed prudently to cover its reactor fuel requirements.

Source: <http://nationalinterest.org>, 04 February 2018.

Geostrategic Nuclear Exports: The Competition for Influence

In December 1953, President Dwight Eisenhower announced that Washington would begin sharing nuclear materials and technology with other nations for peaceful purposes — what became known as the Atoms for Peace program. Although there were multiple motivations for this decision, US officials believed sharing nuclear technology would strengthen bonds with allies and help America compete with the Soviets for the allegiance of nonaligned countries. This geopolitical competition persisted throughout the Cold War, as Washington and Moscow sought to expand their political influence through nuclear exports.

With the end of the Cold War, these strategic incentives lost much of their pull. But today, with America’s “unipolar moment” eroding, they may be poised for a comeback. The 2017 National Security Strategy heralded the return of a competitive world that pits the United States against Russia and especially China. Much ink has been spilled over Moscow’s and Beijing’s efforts to establish beachheads around the world, and how US grand strategy should evolve in response. Despite their historical importance, nuclear energy exports are often overlooked in this debate, which is problematic because Russia and China use trade in civil nuclear technology to gain influence in regions of strategic value, notably Eastern Europe, South Asia, and the Middle East.

As Western nuclear vendors lose market share and declare bankruptcy, Chinese and Russian state-owned enterprises are rushing in to fill the nuclear supply vacuum with competitive bids and alluring capital investments. Saudi Arabia is their next target. In 2016, China inked a deal to “invest \$2.43 billion to build a nuclear manufacturing equipment industrial cluster in Saudi Arabia,”

underscoring the importance of the Kingdom’s position at the western crossroads of the One Belt, One Road initiative. Russia wants to expand its limited footprint in the region with an attractive offer to build nuclear reactors in Saudi Arabia. If Washington cedes the nuclear supply game at this early stage of development in Saudi Arabia, Moscow or Beijing will become the primary stewards of Riyadh’s nuclear ambitions. Both prioritize what Mark Hibbs calls “geostrategic nuclear exports” — the use of nuclear trade to build political relations and acquire leverage over key countries. In the pursuit of this transactional approach, Moscow or Beijing often turn a blind eye to lax nuclear industry standards and weak non-proliferation assurances in recipient countries.

Russia wants to expand its limited footprint in the region with an attractive offer to build nuclear reactors in Saudi Arabia. If Washington cedes the nuclear supply game at this early stage of development in Saudi Arabia, Moscow or Beijing will become the primary stewards of Riyadh’s nuclear ambitions. Both prioritize what Mark Hibbs calls “geostrategic nuclear exports” — the use of nuclear trade to build political relations and acquire leverage over key countries.

Fortunately, the US is taking steps to counter the Russian and Chinese nuclear export strategy. In 2017, US Energy Secretary Rick Perry met with Saudi leadership to prepare for negotiations over a nuclear

cooperation agreement, which is required by US law in order to transfer nuclear materials, equipment, or components. Some non-proliferation advocates argue that US officials should use these talks to pressure the Saudis into forswearing acquiring a uranium enrichment or reprocessing capability — the so-called “Gold Standard” agreement. But this position ignores the hard reality that Saudi Arabia is being courted by state-owned enterprises eager to engage in nuclear trade without pushing for the Gold Standard. Instead, the US should push for a standard nuclear cooperation agreement that would still give it veto power over many — though not all — forms of enrichment and reprocessing in Saudi Arabia. Such an agreement would enhance US access to and influence over Saudi nuclear activities, lower the risk of clandestine proliferation, and potentially position Riyadh to use its nuclear program to keep the lid on Iranian enrichment in the future. By laying the foundation to manage Saudi Arabia’s burgeoning nuclear

aspirations, the United States will put itself in a strong position to counterbalance Russia and China while restoring its sway over global non-proliferation policy.

Back to the Future of Nuclear Supply: During the Cold War, the US was a dominant force in the nuclear marketplace, building dozens of power reactors in countries like West Germany, Brazil, Japan, South Korea, India, and Taiwan. As a crucial supplier, Washington had powerful leverage to set the rules of the game, cooperating with the Soviet Union — the primary supplier to the Eastern Bloc — to establish the IAEA and its safeguards system, the NPT, and Nuclear Suppliers Group. Collectively, these institutions created a framework through which countries could access peaceful nuclear technology while proliferation risks were managed. Indeed, the US has consciously used the promise of peaceful nuclear exports — and the threat of cutting these exports off — as an element of its strategy for preventing proliferation, helping to steer countries like South Korea, Taiwan, Japan, and Sweden away from nuclear weapons.

Now, the American nuclear industry is in precipitous decline as demand for nuclear reactors largely stagnated after the Fukushima nuclear accident, while the cost of nuclear energy has become increasingly uncompetitive against alternative energy sources like natural gas. The result has been multiple countries cancelling nuclear projects, scaling back nuclear energy, or even going so far as to phase out nuclear power reactors.

To make matters worse, the onetime global leader in nuclear energy development, Westinghouse Electric, filed for bankruptcy last year and “all but completely pulled out of the nuclear business overseas” when problems with its manufacturing supply chain led to massive cost overruns at nuclear reactor projects in the American South. As former Deputy Secretary of Energy Daniel Poneman observed in 2016, “of the 60 reactors

under construction around the world today, US vendors have won only four export sales. Reactors aside, our global position as a nuclear fuel supplier is weaker still.” This decline of the Western nuclear industry comes at a time when Russia and China are competing with the United States for influence, especially in the nuclear energy sector.

To be sure, Russia and China oppose nuclear proliferation, and neither wants to be responsible for fuelling an arms race in the Middle East. But as the American nuclear industry continues to lose market share, it is becoming increasingly difficult for Washington to regulate access to nuclear technology around the world. Technology denial and the threat of coercive sanctions have dissuaded many countries from pursuing illicit nuclear-weapons programs. But these non-proliferation policy levers are less credible against an ally that pursues nuclear technology in full compliance with international safeguards, and less effective when the country can turn to many alternative suppliers.

The Saudi Question: Saudi Arabia could exploit the lax approach preferred by Russia and China, especially since it appears to be playing a long game against Iran that banks on the development of nuclear capabilities under the guise of an ostensibly peaceful energy program. Indeed, Saudi officials have hinted at an interest in developing enrichment technology, a crucial step toward the bomb that could be taken without running afoul of the global non-proliferation regime. In December, Energy Minister Khalid al-Falih implicitly justified the development of enrichment technology by emphasizing, “we have large resources of uranium,” and “we will not deprive ourselves of accessing our natural resources.”

Despite America’s diminished leverage, prominent arms control advocates argue that the US should demand the Gold Standard as a condition for peaceful nuclear cooperation with

Despite America’s diminished leverage, prominent arms control advocates argue that the US should demand the Gold Standard as a condition for peaceful nuclear cooperation with Saudi Arabia, implying that if Saudi Arabia will not agree to foreswear enrichment and reprocessing, the US should refrain from nuclear trade with Riyadh entirely. But there are three problems with this prescription.

Saudi Arabia, implying that if Saudi Arabia will not agree to forswear enrichment and reprocessing, the US should refrain from nuclear trade with Riyadh entirely. But there are three problems with this prescription.

First, the Gold Standard is unlikely to be acceptable to Saudi Arabia. Out of more than twenty nuclear cooperation agreements in force, only two contain the Gold Standard provision — pacts with the United Arab Emirates and Taiwan, two countries over whom the US holds unique bilateral leverage. Expecting Riyadh to accept stricter requirements now than Washington has generally asked for in the past — at a time of diminished US influence — defies diplomatic logic. Indeed, Saudi Arabia has argued that a legal pledge to forgo enrichment and reprocessing represents “an unacceptable infringement on its national sovereignty.” When formal discussions began in 2012 over the terms of a nuclear cooperation agreement, Saudi officials flatly refused to “sign an agreement with Washington that would deprive it of enriching uranium.”

Second, if Saudi Arabia refuses to accept the Gold Standard, the likely result is no nuclear cooperation with the United States whatsoever. Many other willing nuclear suppliers, including France, Russia, China, and South Korea, are in negotiations with Saudi Arabia and are unlikely to require it to forswear enrichment and reprocessing. This is likely why the United States signed a nuclear cooperation agreement with Vietnam without the Gold Standard — American officials understood that Vietnam could turn to Russia and Japan if cooperation with the United States was not forthcoming. In the absence of an agreement with the United States, Saudi Arabia could eventually turn to Pakistan for nuclear supplies, a country with a troubling history of dangerous export behaviour.

Third, even if it were possible to strong-arm Saudi Arabia into agreeing to the Gold Standard, this

could have the unintended consequence of pushing it to pursue enrichment in secret, particularly if and when the sunset provisions in the Iran nuclear agreement kick in and Iran ramps up its enrichment program to pre-2015 levels. As former Saudi Director of General Intelligence Prince Turki al Faisal put it in January 2016, Saudi Arabia wants to be “in full stride in terms of human capacity for our own development of peaceful uses of nuclear energy” by the time the constraints on Iran’s nuclear program expire. While initiating a covert enrichment program would certainly be risky — jeopardizing nuclear cooperation and broader relations with the US — Saudi Arabia may feel compelled to take that step if it felt its national security was severely threatened.

By virtue of ratifying the NPT, Saudi Arabia must accept IAEA safeguards on all nuclear facilities, regardless of who built them. Direct involvement in the Saudi nuclear energy program would give Washington additional information, especially if US officials push the Saudis to accept an Additional Protocol as well, thereby granting the IAEA “further inspection authority.”

The Case for Nuclear Cooperation with Riyadh:

A more attractive alternative is a standard nuclear cooperation agreement, which would provide the US with access to and influence over the Saudi nuclear program, including its decision to pursue enrichment or reprocessing. Although the Saudis have balked at the Gold Standard

restrictions in the past, they appear to be interested in resuming talks over an agreement that should be broadly acceptable to the United States and its non-proliferation interests. Such an agreement would likely require Riyadh to adopt a set of mechanisms to inhibit proliferation that are standard in US cooperation agreements, including a peaceful uses pledge and a promise to refrain from enriching or reprocessing using US-origin nuclear material or technology without prior consent from Washington. These non-proliferation conditions could prove to have three major stabilizing effects on Riyadh’s nuclear ambitions and regional security dynamics with Iran.

First, nuclear cooperation would provide the United States with enhanced insight into the evolution of the Saudi nuclear energy program. By virtue of ratifying the NPT, Saudi Arabia must accept IAEA safeguards on all nuclear facilities,

regardless of who built them. Direct involvement in the Saudi nuclear energy program would give Washington additional information, especially if US officials push the Saudis to accept an Additional Protocol as well, thereby granting the IAEA “further inspection authority ... about both declared and possible undeclared activities to gain a more complete picture” of Saudi Arabia’s overall nuclear program. An Additional Protocol would not bar Saudi Arabia from enriching or reprocessing, so long as it were under safeguards, but it would make it easier for the international community to be assured that Riyadh was not engaging in covert nuclear activities. Moreover, it should be politically easier for Saudi Arabia to accept. Unlike the Gold Standard, the Additional Protocol is internationally ubiquitous, with more than 130 countries having signed on. Indeed, Iran recently began provisional implementation of the protocol as part of its commitments under the JCPOA.

Beyond enhanced access and information, the US stands to gain greater leverage over the future direction of the Saudi program if it builds nuclear reactors with American-supplied technology under lifetime contracts for fuel, rather than ceding control to suppliers from Russia or China. This would lock Saudi Arabia into a nuclear program largely dependent on US-supplied technology and materials, thereby requiring Saudi officials to seek prior consent over most uranium enrichment activities. Washington would effectively gain a veto on whether Riyadh could develop its own gas centrifuge program or produce weapons-usable material using US-supplied inputs. Moreover, the United States could threaten to cut off nuclear supplies if Saudi Arabia violates its non-proliferation commitments.

Second, Iran may be deterred from expanding its enrichment program if it fears a reciprocal response from the Saudis. Under the standard nuclear cooperation agreement, Washington could grant Riyadh prior consent to pursue commercial fuel enrichment if Tehran decides to ramp up its enrichment capabilities after key constraints in the nuclear deal expire. If Saudi Arabia publicly signals its intentions in this way, Iran may proceed more cautiously for fear of

setting off an escalation that results in mutually assured enrichment. Indeed, recent research demonstrates that nations have leveraged the threat of proliferation to deter aggression or bargain for concessions from adversaries. To be clear, we are not arguing that the US should encourage or even ultimately grant Saudi Arabia advance consent to enrich. However, it may be in the US interest to keep this option open — as the United States does in the vast majority of its nuclear cooperation agreements — to facilitate public Saudi signalling on enrichment rather than clandestine development.

Third, by tolerating Saudi Arabia’s nuclear desires within clear above-board limits, the standard nuclear cooperation agreement reduces the overall incentives for the Saudis to cheat on their non-proliferation obligations. Saudi officials are far less likely to act out of desperation if they feel the Kingdom is secure with some baseline capacity to balance against Iran. The nuclear cooperation framework provides the United States with an effective set of tools to manage how the Saudis invest in this *realpolitik* insurance policy.

Managing Mutually Assured Enrichment: Of course, in an ideal world, the United States would be able to convince Saudi Arabia and Iran to forego sensitive nuclear technology entirely. But as Jessica Varnum points out, US officials consistently tailor nuclear cooperation agreements to recognize limited leverage and hard facts on the ground. Nevertheless, there are potential downsides to a standard US nuclear cooperation agreement with Saudi Arabia. The framework leaves open pathways for Saudi Arabia to pursue enrichment technology without US consent so long as it does not use US supplied technology or materials. Most problematically, it gives the UAE the legal right to seek revision to the terms of its own agreement to remove the Gold Standard provisions.

Indeed, Yousef al Otaiba, UAE’s ambassador to the US, indicated in 2015 that his country might want to renegotiate the agreement because Iran had “achieved this right to enrich” under the JCPOA. This could eventually put Washington in

the tenuous position of fielding requests from Riyadh and Abu Dhabi to pursue indigenous enrichment programs. Others argue that leaving open the option of Saudi enrichment could undermine Trump administration attempts to convince Iran to accept more stringent restrictions than those already required under the JCPOA. Instead of inhibiting an arms race, the threat of mutually assured enrichment by multiple actors in the Middle East could spiral out of control. To manage these serious risks, Washington should push foremost for Riyadh to adopt an Additional Protocol with the IAEA during the nuclear cooperation negotiations. The protocol would go a long way toward convincing the international community of Saudi Arabia's intent to pursue licit peaceful nuclear activities in lieu of clandestine pathways to enrichment.

Furthermore, US and Saudi officials may be able to find common ground by considering modifications of the standard nuclear cooperation agreement that avoid the sticky Gold Standard. For instance, the Saudis could declare their intent (rather than make a political commitment) to refrain from enrichment or reprocessing for a certain period of time. Or the countries could establish a joint commission, as in the US-South Korea agreement, to study the implications of enrichment or reprocessing in Saudi Arabia before granting Washington's approval to utilize US technology or materials to that end. ...

Source: <https://warontherocks.com>, 07 February 2018.

TAIWAN

Taiwan Power Co. Seeks to Reactivate Nuclear Reactor in New Taipei

On 5 February 2018, the Taipower Company submitted an application to Taiwan's Atomic Energy Council (AEC) for authorization to restart a nuclear reactor at the No. 2 nuclear plant in Wanli, New Taipei. Taipower has asserted that in light of Taiwan's new energy policies, and increased energy usage during the winter months, that there may be a looming power shortage facing the country. In response however, various environmental groups and some legislators have raised their voices in objection that Taipower would even

consider such an action.

Ever since the tsunami and resulting nuclear disaster at the Fukushima Daiichi plant that occurred in Japan in 2011, the movement for Taiwan to become a completely nuclear free country has gained considerable momentum, and the DPP led government has pledged to have a completely "nuclear-free" Taiwan by 2025. The reactor in Wanli, New Taipei, was shut down in May 2016, reportedly because of a glitch in its electrical system. According to CNA, after maintenance to the reactor facility was completed in December 2017, all the glitches had been resolved. Next, pending a 30 day safety review to obtain approval from the AEC, Taipower's request will proceed to the Legislative Yuan. Taipower claims that with the reactor in operation it would provide a full 985 megawatts of electrical power, which would boost Taiwan's national energy reserve by 3 percent.

A separate report from CNA notes that an array of criticisms have been raised in response to the motion from Taipower. Some critics claim that after 600 days of being offline, that restarting the reactor could prove costly, and may cause mass power outages. Other critics claim that Taiwan still possesses an abundant surplus of energy, and that the claims of a looming power shortage from Taipower are entirely unfounded. Regardless of the exact details of Taiwan's energy production and energy reserves, restarting the nuclear reactor would come at an extremely high political cost to the DPP, because of the current drive for the country to "Go Green" and the pledge that Taiwan would be nuclear free by 2025. Taipower insists that investment and sound economic growth will be stunted if Taiwan is unable to stabilize energy production during this crucial transition that the country has undertaken. The company and proponents of nuclear energy assert that restarting the reactor is simply a pragmatic measure to ensure adequate energy reserves.

The application from Taipower, if approved, would only call for operation of the reactor through 2023, the year in which the No. 2 nuclear plant is already scheduled to be

completely retired from operation. The government has also recently come under criticism for the deteriorating air quality that continues to afflict most of the country's population centres. The problem is partially the result of an increased reliance on burning fossil fuels to mitigate the energy deficit incurred by shutting down the island's nuclear reactors. Taiwan currently possess four nuclear reactors, however one of them has never been activated. Among the remaining three, there are six operational reactors, but only half of them are being used currently. All of Taiwan's reactors are scheduled for retirement in the coming years, with the No.1 reactor to be permanently shut down in 2019, No.2 in 2023, and the final reactor at the No.3 power plant scheduled for retirement in May 2025.

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Source: <https://www.taiwannews.com.tw>, 06 February 2018.

NUCLEAR COOPERATION

JAPAN-CHINA

Japan Seeking Policy Talks with China before Leaders' Visits

Japan is proposing fresh dialogue with China in several specific fields to prepare for the potential resumption of reciprocal leaders' visits amid a thaw in long-strained bilateral ties.... Tokyo has already put out feelers through diplomatic channels about new bilateral dialogue frameworks on climate change, nuclear disarmament and counterterrorism, the sources

said, aiming to bridge policy differences to help realize the visits in the near future. Japan-China relations are showing signs of improvement after both Prime Minister Shinzo Abe and Chinese President Xi Jinping reinforced their domestic support in key political events late 2017. Neither Abe nor Xi has held talks in the format of an official visit to the other's country since they both took office in 2012.

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On climate change, Tokyo wants to hold regular talks with the world's biggest greenhouse gas emitter to discuss how best to reduce emissions,

according to the sources. Bilateral talks on nuclear disarmament are hoped to allow Japan and China to discuss measures the international community should take, and also help them reduce tensions over the fundamental difference in their positions. Japan is sheltered by the US

"nuclear umbrella," while China has its own nuclear arsenal. Dialogue on counterterrorism would challenge the two countries to find common ground. While counterterrorism policy in China is intertwined with a crackdown on ethnic minority movements, Japan is concerned about protecting the 2020 Tokyo Olympics and Paralympics and other events, the sources said.

Source: <https://english.kyodonews.ne>, 30 January 2018.

URANIUM PRODUCTION

USA-RUSSIA

Obama-era Russian Uranium One Deal: What to Know

As federal investigators continue to look into

Russian interference in the 2016 presidential election, prosecutors are also probing an Obama-era sale of a uranium mining company. Attorney General Jeff Sessions in 2017 directed federal prosecutors to look into the sale of Uranium One to a Russian company – a transaction that President Trump has called the “real Russia story.” The Hill reported that Russian officials engaged in a “racketeering scheme” to further its energy goals in the US. And an FBI informant recently told congressional committees that Russia paid millions to a US lobbying firm in an effort to influence then-Secretary of State Hillary Clinton to make sure the deal was successful.

What was the Uranium One Deal? In 2013, Rosatom, backed by the Russian state, acquired a Canadian uranium mining company, now called Uranium One, which has assets in the US. Uranium is a key material for making nuclear weapons. Through the deal, Russia is able to own about 20 percent of US uranium production capacity. However, Colin Chilcoat, an energy affairs specialist who has written extensively about Russia’s energy deals, said that the company only extracts about 11 percent of uranium in the US. The deal also “doesn’t allow for that uranium to be exported at all,” Chilcoat told Fox News. “It’s not like it’s leaving the US or somehow finding its way to more insidious players.” The agreement was approved by nine government agencies with the Committee on Foreign Investment in the US (CFIUS), an inter-agency group that reviews how certain foreign investments can impact national security. The State Department under Clinton was one of those agencies, though Clinton told WMUR-TV in 2015 that she was not “personally involved” in the agreement.

Why is it Controversial? Some investors reportedly donated millions of dollars to the Clinton Foundation. Former President Clinton also received a \$500,000 speaking fee in Russia and reportedly met with Vladimir Putin around the time of the deal, Republicans, who are largely critical of the deal, have said. The FBI had looked into the agreement and uncovered that some Russian nuclear industry officials were engaged in nefarious dealings, which included extortion,

bribery and kickbacks, The Hill reported. Evidence of wrongdoing by Vadim Mikerin, the Russian official overseeing Putin’s nuclear expansion in the US who was eventually sentenced to prison, was discovered by the FBI before the deal was approved, according to The Hill.

Author Peter Schweizer – who wrote about the deal in his 2015 book “Clinton Cash” – told Fox News that there is no evidence that the people involved with approving the agreement knew that the FBI had an ongoing investigation into it. But White House Press Secretary Sarah Sanders told Fox News “if anyone colluded for a foreign government in [the 2016] election, it was the Clinton campaign [and] the Democrats.”

What did the Informant Reveal? Douglas Campbell, the FBI informant, alleged that Moscow paid millions of dollars to a lobbying firm to help Bill Clinton’s charities in order to influence Hillary Clinton, who was then former President Barack Obama’s secretary of state. Campbell made the claims in a 10-page statement given to the Senate Judiciary Committee, House Intelligence Committee and House Oversight and Government Reform Committee. Campbell said Russian nuclear officials “told...at various times that they expected APCO to apply a portion of the \$3 million annual lobbying fee it was receiving from the Russians to provide in-kind support for the Clinton’s Global Initiative.”

“Your Real Russia Story is Uranium”: President Donald Trump “The contract called for four payments of \$750,000 over twelve months,” Campbell said in the statement. “APCO was expected to give assistance free of charge to the Clinton Global Initiative as part of their effort to create a favourable environment to ensure the Obama administration made affirmative decisions on everything from Uranium One to the US-Russia Civilian Nuclear Cooperation agreement.” APCO Worldwide is a global public affairs consulting agency. In a statement to Fox News, APCO said Campbell’s allegations are “false and unfounded.”

“The key issues at stake in this investigation are all about intent and knowledge: was there an intent to influence official business, and, if so,

did the recipient take the money in exchange for taking official action,” Jamil Jaffer, a former counsel in the Justice Department and the director of the National Security Law and Policy Program at George Mason University’s Antonin Scalia Law School, told Fox News. But Jaffer said the credibility of the so-called informant will also come into play. “Was this a foreign agent or criminal who turned? Was this a private individual the FBI placed inside [the deal]? Was this a government employee? All these factors, plus the level of the informant’s access to relevant information, will make a big difference here,” Jaffer said.

But what does this Deal have to Do with the Russia Investigation? Multiple congressional committees, as well as the Justice Department, are looking into possible Russian collusion in the 2016 presidential election – and ties between Russians and Trump’s campaign. “That’s your real Russia story. Not a story where they talk about collusion and there was none. It was a hoax. Your real Russia story is uranium,” Trump has said. And the investigation was led by then-Assistant FBI Director Andrew McCabe, then-US Attorney Rod Rosenstein, The Hill reported. Rosenstein is now the deputy attorney general; McCabe, until January, was the deputy director of the FBI. Mueller’s investigators in the Russia probe report to Rosenstein.

The special prosecutors instructed by the Justice Department to investigate “certain issues” pertaining to the Uranium One deal will also report to Rosenstein and Sessions, according to a letter obtained by Fox News. Congressional committees are looking into whether Mueller informed the Obama administration, particularly those tasked with approving the Uranium One deal, prior to CFIUS approval. In her attempt to discredit reports of the controversy surrounding the Uranium One deal, Clinton said Trump and “his allies,” are diverting from the investigation. “The closer the investigation about real Russian ties between Trump associates and real Russians ... the more they want to just throw mud on the wall,” she said. “I’m their favourite target, me and President Obama.”

Source: <http://www.foxnews.com>, 08 February 2018.

NUCLEAR NON-PROLIFERATION

CUBA

Cuba Ratifies Treaty on Prohibition of Nuclear Weapons

Cuba is now on the list of countries that have ratified the Treaty on the Prohibition of Nuclear Weapons, thus demonstrating its commitment to the non-proliferation of such devices. Cuba’s permanent representative at the UN, Anayansi Rodríguez, said that she deposited the instrument of ratification of that treaty in an official ceremony on 30 January 2018. With this action, Cuba confirms that it grants the highest priority to the sphere of disarmament, according to a statement from Cuba’s diplomatic mission at the UN. The Treaty on the Prohibition of Nuclear Weapons was signed by Cuban Foreign Minister Bruno Rodríguez on September 20, 2017, along with representatives of 41 other States.

To date, Cuba has been the fifth country to ratify the convention. This international legal instrument obliges its member States not to develop, test, produce, manufacture, or otherwise acquire, possess or stockpile nuclear explosive devices and weapons. The Treaty on the Prohibition of Nuclear Weapons, adopted by 122 UN member States in favor on July 17, 2017, aims to achieve a world free of these lethal devices. Cuba has warned on several occasions about the threat posed by nuclear weapons against the existence of the human race, as well as the catastrophic consequences of their use.

Source: <http://www.cadenagramonte.cu>, 31 January 2018.

IRAN

Iran Says it can Discuss other Issues if Nuclear Deal Successful

The West must ensure the Iran 2015 nuclear deal succeeds before trying to negotiate other issues, a senior Iranian official said in a rare public suggestion. Tehran could discuss matters such as its regional activities or missile program with

world powers. "Now they ask Iran to enter discussions on other issues. Our answer is clear: Make the (deal) a successful experience and then we discuss other issues," Deputy FM Abbas Araqchi told a conference in Paris on 8 February, referring to the US and its European allies. It was not immediately clear whether Araqchi's suggestion was in complete alignment with powerful hardliners in the Islamic Republic's factionalized governing institutions who are intensely suspicious of any talks with the West. Araqchi added that the Iran policy of US President Trump's administration was "destructive" and violated the terms of the nuclear deal with six world powers. With Trump warning of a last chance for "the worst deal ever negotiated", Britain, France and Germany are working on a plan to satisfy him by addressing Iran's ballistic missile tests and its regional influence while preserving the 2015 accord.

Speaking to Reuters on the sidelines of a Euromoney...Araqchi said there was no link between its influence in the Middle East region and the accord, under which Iran restricted its production of enriched uranium - a potential source of nuclear bombs as well as civilian energy - in exchange for a removal of international sanctions. Iran has repeatedly refused to discuss its missile program as demanded by the United States and the Europeans, saying it is purely defensive in nature. The Islamic Republic says its nuclear program is only for peaceful purposes and that it will stick to the accord as long as the other signatories respect it, but will "shred" the deal if Washington pulls out.

Blame Game: Araqchi dismissed Western assertions that Iran's regional activities are destabilizing. He accused the US, Israel and Saudi Arabia of fomenting tensions in the Middle East. "We have always fought against terrorism. Iran has always played a key role in bringing stability

and peace to the region.... There is no link between the (nuclear) deal and our role in the region," Araqchi, who was also a senior negotiator in the Iran nuclear talks....

Trump's ultimatum has effectively put the deal on life support until mid-May. Speaking at the same conference, Britain's Minister for the Middle East, Alistair Burt, said European powers were determined to save the agreement and assuage the US, but he warned that Iran also needed to mitigate Western concerns over its regional activities. "We and our European partners are absolutely clear. We want the deal to succeed,"

Burt said. "We don't want to see the JCPOA ...go down and are working with our European partners to mitigate concerns the United States may have to ensure it continues."

Negotiations between Europeans and the US

officials to meet Trump's conditions are ongoing. The first challenge the Europeans face is dissecting divergent US statements about what Trump wants to keep issuing "waivers" to US sanctions. Without the waivers, which expire May 12, the US sanctions return, effectively killing the deal. "Iran also needs to avoid taking actions which threaten regional security," Burt said, pointing to claims that Tehran has supplied ballistic missiles to Houthi rebels in Yemen.

Iran has denied those allegations. Iran backs Syrian President Bashar al-Assad in his country's almost seven-year-old civil war, Shi'ite Muslim militias in Iraq, Houthi rebels in Yemen and Lebanon's Hezbollah. "Iran has always played a key role in establishing peace, restoring security and fighting against terrorism across the region," Araqchi said. "Policies of Israel, Saudi Arabia and the United States have led to crises and wars in the Middle East."

Source: <https://www.reuters.com>, 08 February 2018.

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UK

Safeguarding Britain Nuclear Non-Proliferation Obligations after Brexit

Britain’s Nuclear Safeguards Bill overcame its first major hurdle...and will now undergo further parliamentary scrutiny before receiving Royal Assent later in 2018. Now is a good time to reflect on the Bill’s necessity and the obstacles it will face.

Britain’s departure from the EU in March 2019 will have an impact on safeguards at civil nuclear facilities. To provide the legal basis for a new safeguards system after Brexit the Nuclear Safeguards Bill is currently undergoing parliamentary scrutiny. The referendum result offered no guidance on the UK’s future relationship with Europe. Prime Minister Theresa May sought to shape events

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by drawing a line in the sand, saying the UK would take back control of its laws from Brussels, which meant quitting Europe’s highest court, the European Court of Justice (ECJ). In nuclear terms, there are many implications of this decision. Controversially, triggering Article 50 empowered the government to withdraw from the European Atomic Energy Community – Euratom – which operates under the jurisdiction of the ECJ in March 2019. This decision has far-reaching consequences for the UK, particularly its obligations under the NPT. Together with the IAEA, Euratom ensures that UK civil nuclear facilities comply with safeguards requirements. However, the UK will repatriate this role in March 2019. This will require the empowerment of the Office for Nuclear Regulation (ONR) – an existing and independent British statutory body – and the conclusion of a new safeguards agreement with the IAEA. The Nuclear Safeguards Bill is the legislative vehicle for these new powers; it is therefore instrumental in containing the collateral damage of an unwanted nuclear Brexit.

MPs have repeatedly expressed concern over the potential diminution of safeguards standards attendant upon leaving Euratom. Yet, while there is a grain of truth in this assertion, a lack of nuance clouds debate. Under Euratom, mandatory safeguards apply to all civil nuclear materials and facilities in the UK. This will change when the UK withdraws. Non-nuclear weapons states are required to sign Comprehensive Safeguards Agreements (CSA) with the IAEA under the NPT. These allow for peaceful nuclear technology while ensuring there is no development of nuclear weapons. As a nuclear weapons state, the UK is

not required to sign a CSA – it will instead conclude a new Voluntary Offer Agreement (VOA) with the IAEA. Various civil facilities will be ‘voluntarily offered’ by the UK for safeguarding. The IAEA will then safeguard some of these facilities, ensuring civil nuclear materials are used for peaceful purposes. In

this narrow sense, Euratom’s standards are stricter than those of the IAEA: after leaving the EU, safeguards in Britain will be increasingly consensual rather than mandatory. This gives some credence to the idea that safeguards standards are being diminished. However, this does not that imply the UK is turning its back on its non-proliferation obligations.

First, nuclear weapons states, including the US, have concluded VOAs with the IAEA. No one is concerned about weaknesses in safeguards – the US meets its NPT obligations satisfactorily. Second, IAEA and Euratom safeguards are based on different precepts. The IAEA is about non-proliferation. Conversely, Euratom is about economics – safeguards contribute to a level playing field in Europe, ensuring that, say, France and the UK do not benefit economically from their nuclear weapons programmes. Third, the ONR has not expressed concerns about achieving IAEA standards following Brexit. The UK will seemingly be able to meet its commitments under the NPT.

This stands in contrast to Euratom standards. While the UK has committed to meeting this higher standard in future – to facilitate cooperation – the pledge is unlikely to be achieved in the short-term. While this is unfortunate, it is IAEA standards that are key from a non-proliferation perspective. Ultimately, the government has no choice but to get the Bill through Parliament. The UK must have a fully functional domestic safeguards regime following Brexit. In no way is this a ‘contingency measure’ as the opposition Labour Party suggests.

The government could help its cause by being more respectful of parliament – releasing documentation in a timely way, for instance – although delays are dictated partly by the Brexit-driven workload affecting much of Whitehall. Expect an increasing focus on the UK’s future relationship with the IAEA and Euratom, and Nuclear Cooperation Agreements with third-party states. The latter enable the UK’s civil nuclear sector to function, providing a legal basis for trade and supporting the movement of nuclear specialists from the EU and beyond. This is essential in delivering the UK’s ambitious nuclear ‘new build’ programme. As a foretaste of things to come, the House of Lords EU Committee concluded in a recent report that ‘[f]ailure to replace [Euratom’s] provisions by the point of withdrawal could result in the UK being unable to import nuclear materials and have severe consequences for the UK’s energy security’. The debate is only just starting.

Source: <https://rusi.org>, 05 February 2018.

NUCLEAR PROLIFERATION

NORTH KOREA

How North Korea Built a Nuclear Arsenal on the Ashes of the Soviet Union

Viktor Moisa, a retired rocket scientist, welcomed the North Koreans to his institute in eastern Ukraine just as he would with any other

guests. He took them upstairs to the showroom of Soviet satellites and rocket engines, the pride of the institute’s collection. Then they went out to the yard, where an array of parts for ballistic missiles were on display. This was in the early 2000s, well before North Korea would test its first nuclear bomb in 2006.

So the visitors’ interest in missile technology did not arouse Moisa’s suspicion. “They came as tourists”.... “At least that’s how they presented themselves.”

Over the past eight months, North Korea has test-launched three rockets capable of striking the US mainland. According to missile experts in the US and Europe, the key components of these rockets are based on Soviet designs, much like those displayed in Moisa’s museum.

We were standing in the same yard he had shown to the North Koreans, a paved lot in the city of Dnipro where old missile components are still on show, many of them made at a nearby rocket factory known as Yuzhmash. Guidance systems, fuel

pumps and the massive cones designed to hold nuclear warheads at the tip of a rocket all stood in the autumn sun like leftovers from a military rummage sale. Moisa, a cheerful 79-year-old with a puff of silver hair, says he understands in retrospect that his guests from North Korea were probably spies. “It’s just a guess,” he told me with a smile. “But they were probably dreaming of being a real missile power.”

That dream has since been achieved. Over the past eight months, North Korea has test-launched three rockets capable of striking the US mainland. According to missile experts in the US and Europe, the key components of these rockets are based on Soviet designs, much like those displayed in Moisa’s museum. The latest North Korean breakthrough, the Hwasong-15 missile, was tested in November; experts believe it could be powerful enough to lob a nuclear warhead all the way to New York City. This feat of engineering, which only a few nations have ever achieved, exposed a long history of failures on the part of the US and its allies. It showed that the strict sanctions they imposed on North Korea failed to isolate its military. It showed that North Korea, a country

so poor that its cities go dark at night to save power, was still able to acquire some of the world's most sensitive technology and hire experts who know how to use it. It showed that, despite decades of non-proliferation efforts, a rogue nation had obtained a weapon capable of starting World War III.

Now, as the world adjusts to the reality of a nuclear North Korea, its young dictator Kim Jong Un has begun to sell this technology abroad. One of his most eager customers is the regime in Syria, which is also under strict international sanctions, according to a classified report that the UN Security Council is due to discuss at the end of February. A draft of the report...suggests that Russia—Syria's steadfast supporter—may be turning a blind eye to this trade while stonewalling UN efforts to investigate it. As a permanent member of the Security Council, Russia has always denied such accusations. President Putin insisted in December that he has tried to help the West in curtailing the spread of weapons of mass destruction. But in the same breath, he blamed the US for leaving Kim no choice but to go nuclear. "For North Korea, this was the only way of self-preservation," Putin said. "WMDs and missiles." Pyongyang's weapons program had help from a variety of sources. The regime's ability to enrich uranium, a key step in building a nuclear warhead, is believed to have come from Pakistan. But launching those warheads across continents would be impossible without Russian or Ukrainian technology, experts have concluded; and that is what allowed North Korea to become a truly global threat. Starting in the early 1990s, the North Korean military

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In another case in Russia last summer, two sets of surface-to-air missiles were found in a garbage dump in eastern Siberia. Among the experts studying North Korea's newest rockets, the first to raise the alarm over their Soviet origins was Michael Elleman, a former UN weapons inspector and consultant to the Pentagon.

methodically sought to assemble its weapons program from the ruins of the Soviet missile industry. The regime's first team of foreign missile experts was recruited inside Russia, and recruitment efforts have continued in the decades since.

Such scientists, including experts in chemical, nuclear and biological arms, are not hard to find in Russia and Ukraine. By US estimates, tens of thousands of them were left jobless after the Soviet Union fell apart. "And there were huge temptations for scientists to take some of their knowledge and potentially sell it elsewhere," says former US Ambassador to Ukraine Carlos Pascual, who headed the Russia desk at the White House in the late 1990s. "Given what was at stake, and what the cost of that knowledge leaking out might be, I think few had a clear understanding of how important this was."

The warning signs look painfully clear in hindsight. As early as 1991, and as recently as 2011, North Koreans were caught trying to acquire Soviet-era missile technology, which has not always been kept under lock and key. In 2002, six tons of components for a Soviet ballistic missile turned up in a Ukrainian scrapyards. In another case in Russia last summer, two sets of surface-to-air missiles were found in a garbage dump in eastern Siberia. Among the experts studying North Korea's newest rockets, the first to raise the alarm over their Soviet origins was Michael Elleman, a former UN weapons inspector and consultant to the Pentagon. He had seen many of these weapons up close over the years. After the fall of the Soviet Union, he took part in US programs

to dismantle some of the largest missiles in the Russian stockpile, and he understood how easy it would be for this technology to leak. "As a proliferation risk," he told me, "this has never really gone away."

That seemed clear from North Korea's latest missile launches. At his think tank in London, the IISS, Elleman compared footage of those launches shown on North Korean television in July with photos of Soviet missile engines dating to the 1960s. One of them appeared to match the RD-250, an outdated but highly reliable machine. Roughly 200 of these engines still exist, according to Yuzhmash, the missile factory in Dnipro that made them. Nearly all are stored in Russia, but Elleman concluded that if one had been stolen, it would more likely have been from a smaller stockpile in Ukraine. He pointed in particular to Yuzhmash itself, which was known to have been a target of North Korean spies not posing as tourists. Two of them were arrested in Ukraine in 2011 while trying to purchase copies of the factory's designs; both are now serving eight years in prison for espionage.

In some ways, the plant was an obvious target. Founded during World War II to help the Red Army defeat the Nazis, it went on to develop many of the Soviet Union's most powerful ballistic missiles....In October 2017 we were greeted by the sight of a missile code-named "Satan," which was once capable of orbiting the earth and, at Moscow's command, dropping a hail of nuclear warheads on its target. "This was our pride," says Vladimir Platonov, the factory's in-house historian. "We kept the Americans up at night." But the end of the Cold War made such weapons seem unnecessary. Under pressure from the US and Russia, Ukraine agreed in 1994 to give up the arsenal of nuclear warheads it inherited from the Soviet Union. It also pledged to disarm the ballistic missiles meant to carry those warheads.

For the cause of global disarmament, this was a breakthrough. For Yuzhmash, it was a disaster. Thousands of its engineers lost their jobs as

the state's demand for missiles dried up. Today the factory makes tractors and trolley buses to make ends meet. What rockets it still builds are intended to launch satellites into orbit. Traditionally, its most reliable customer for these rockets has been Russia. But the conflict that broke out between the two countries in 2014 severed many of the economic ties between Russia and Ukraine, especially in sensitive fields like rocket technology. Yuzhmash fell on even harder times, slashing wages, rationing electricity and laying off the bulk of its staff. "It was a question of survival for us," says Oleg Lebedev, the factory's chief of production.

... In fact, the exodus began decades ago. In April 1991, as the Soviet Union was dissolving, a specialist in solid-state physics named Anatoly Rubtsov was approached by a group of North Koreans at an academic conference in Beijing. He had worked for years at a top-secret facility in southern Russia, producing intermediate-range missiles for the Soviet arsenal. But his loyalties seem to have flagged as his nation fell apart, and he became one of North Korea's first known recruits from the former Soviet Union. The North Korean offer, compared with Rubtsov's prospects back home, must have seemed like a saving grace. As he later explained in interviews with Russian and Western reporters, he was invited to set up a research institute in North Korea and staff it with Russian engineers. Their aim would be to establish the regime's missile program, according to Rubtsov's own published accounts. But it didn't stay secret for long.

On Oct. 15, 1992, about 60 of his recruits were detained at a Moscow airport, and news of their plans caused an international scandal. Under pressure from the US and South Korea, the Kremlin agreed to prevent Russian scientists from working on the North Korean missile program. Pyongyang took this as a sign of betrayal. The regime's relations with the Soviets had always been comradely. The founder of the dynasty that still rules North Korea, Kim Il Sung, was installed in power by the Soviet military in

1945 on the direct orders of Joseph Stalin, and the Soviets provided Kim with the tanks and artillery he used in 1950 to invade South Korea.

In 1961, Moscow signed a treaty of mutual defence and cooperation with Pyongyang. The agreement obliged the Soviet Union to defend the Kim regime if it ever came under attack. But President Boris Yeltsin and his band of reformers had no intention of honouring that agreement after they took power in Russia in 1991. "We had a different understanding of that responsibility," says Georgy Kunadze, who as Russia's Deputy Foreign Minister for Asia was dispatched to Pyongyang to explain how Russian thinking had changed. He understood upon arrival that the North Koreans felt abandoned by Moscow.

Their subsequent push to build a nuclear weapon was, to a large extent, driven by a resulting sense of insecurity, Kunadze says.

During his meetings in Pyongyang, he asked that North Korea stop inviting Russian scientists to build their arsenal for them. "They gave some mild assurances, and that was that," he says. These assurances meant little in practice, as did Russia's attempts to stop its scientists from going to work where they pleased. In a recent interview, the prominent missile designer Yuri Solomonov admitted that Russian scientists did wind up working on the North Korean weapons program in the 1990s. "They took the bait," he told the state-run newspaper Rossiyskaya Gazeta in December.

Kunadze, who went on to serve as Russia's ambassador in South Korea, says there was little the government could do to stop them. "Russia at the time ... was a total mess," he says. "Nobody had any money. The borders were open." And the Russian scientists who traveled to North Korea were not in violation of any Russian laws. "So all we could do was reason

with them," says Kunadze. "In the end, it was their choice." The most immediate impact of the Rubtsov scandal was the alarm it caused in Western capitals, which were forced to realize the potential danger of an unchecked Soviet brain drain.

The US and Europe responded in 1993 by throwing money at the problem. Acting in sync with partners in Europe and Canada, the US set up two organizations that year, one based in Moscow and the other in Kiev, with the aim of giving tax-free grants to scientists in Russia, Ukraine and other formerly communist nations.

"Our goal was never to fund science," says Curtis Bjelajac, the director of this operation in Kiev, which is called the Science and Technology Center in Ukraine. "The whole thought process behind the STCU was, It's a handout." By his estimate, between 15,000 and 20,000 experts in weapons of mass destruction were

left jobless in Ukraine alone after the fall of the Soviet Union. The number in Russia was likely far higher. Most of them were middle-aged or elderly. So the aim was to keep them busy until they either transitioned to work in the private sector or grew too old to go abroad.

Initially, it worked. At its peak around 2003, the programs in Moscow and Kiev were jointly giving out some \$100 million per year in the former Soviet Union. This lifeline did not simply make the difference between a steady income and abject poverty for researchers across the region. It also nurtured their dignity by allowing them to continue working in their fields, says Dimitry Bazyka, one of Ukraine's leading experts in nuclear technology. "It gave us a reason to value ourselves," he says. His nuclear institute still functions today with Western support, but it is a shoestring affair. Its campus abuts an outdoor bazaar in eastern Kiev full of kebab shops and peddlers of bric-a-brac. The

In 1961, Moscow signed a treaty of mutual defence and cooperation with Pyongyang. The agreement obliged the Soviet Union to defend the Kim regime if it ever came under attack. But President Boris Yeltsin and his band of reformers had no intention of honouring that agreement after they took power in Russia in 1991.

entrance to the compound was so hard to find amid the maze of alleyways and vendors that I ended up climbing over a fence to get inside. No one stopped me. Scientific institutes in Russia have generally fared better, but their record of security is mixed at best. In the winter of 2011, two bloggers found a way to sneak into one of Moscow's most secretive missile factories, Energomash, and spent several nights photographing its technology. They did not encounter a single security guard.

Although highly embarrassing for Russia's missile industry, the incident did not make many headlines in the West, where terrorism and the wars in the Middle East had eclipsed other security concerns in the early 2000s. Public interest in the safety of Soviet-era weapons technology dwindled, as did support for obscure programs like the STCU. "Our donors concluded that the threat from weapons scientists had been contained," says Bjelajac. But Serhiy Komisarenko, one of Ukraine's leading experts in biological weapons, said the money was never enough to cease the flow of personnel. "The temptation to go abroad was always intense," he said. "And it still is."

Whether any of Ukraine's impoverished scientists have gone to work in North Korea is difficult to prove. In eastern Ukraine, one rocket scientist agreed through an intermediary to discuss his work in Pyongyang with TIME, but then changed his mind at the last minute and refused to meet me. It's hard to blame him. With the renewed concern over technology leaking

out, Ukraine's security services have stepped up monitoring of former weapons scientists. Those caught selling their expertise abroad could face charges of treason. The UN panel of experts on North Korea has not found anyone either. In preparing its latest report to the Security Council, the panel sent inquiries to

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Russian officials, asking for the names and passport numbers of any weapons scientists who might have passed through Russia on their way to Pyongyang. They received no response, according to the draft of their report. In some sense, the silence was typical of Russia's two-

faceted position on the issue.

Throughout his 18 years in power, Putin has supported or acquiesced to UN sanctions that have sought to isolate the Kim regime. But he

Throughout his 18 years in power, Putin has supported or acquiesced to UN sanctions that have sought to isolate the Kim regime. But he has also offered Pyongyang ways to escape that isolation. Less than two months after Putin took power in 2000, Russia signed a treaty of friendship and co-operation with North Korea, reviving many of the diplomatic ties that bound Moscow to Pyongyang during the Cold War.

has also offered Pyongyang ways to escape that isolation. Less than two months after Putin took power in 2000, Russia signed a treaty of friendship and co-operation with North Korea, reviving many of the diplomatic ties that bound Moscow to Pyongyang during the Cold War. A few months later, Putin became the first Russian or Soviet leader

ever to pay an official visit to North Korea. "That totally revitalized our relationship," says the former Russian diplomat Konstantin Pulikovskiy, who helped steer Moscow's relations with Pyongyang. "The main thing was the personal rapport between the two leaders."

The second tyrant of the ruling dynasty, Kim Jong Il, had an even deeper connection to Russia than did his father. He was born in the Soviet

Union, in a dirt-road village called Vyatskoe, where he lived for the first few years of his life under the name Yuri Irsenovich Kim. During that first meeting with Putin, he made no secret of his nuclear ambitions. “He told me back then that they have an atom bomb,” Putin recalled during a televised interview in October 2017. “And more than that, he said they could use some pretty basic artillery to launch it all the way to Seoul.” That first impression has not discouraged Putin from building bridges to the Kim regime.

Even amid the spate of new missile tests over the past year—and the new UN sanctions imposed on North Korea in response—Moscow has continued to assist Pyongyang in crucial ways. A major Russian telecommunications firm provided North Korea with a new link to the Internet in October, relieving it of its dependence on China’s fiber-optic cables. Around the same time, North Korean ships were spotted picking up loads of fuel in Russia and, despite a tightening international oil embargo, bringing it back to their homeland. For Putin, there would seem to be little obvious upside in nurturing this friendship. His country shares a border with North Korea, whose refugees would likely pour over the so-called Bridge of Friendship into Russia if a war ever broke out. A nuclear explosion in the area would also put Russian citizens in serious danger, especially in the nearby city of Vladivostok.

But Putin’s thinking goes beyond such immediate considerations, says Kunadze, the former Russian diplomat. Only in the broader context of Russia’s rivalry with the West does it start to make sense. “In that context, North Korea is the enemy’s enemy,” Kunadze says. “It keeps the US distracted. And that’s valuable in itself.” Whether it is valuable enough for Putin to arm North Korea directly—or turn a blind eye to smugglers who are seeking to do the same—

remains an open question. The most likely players in this trade have so far tended to blame each other: Ukraine insists that Russia is the source of North Korean arms, and Russia points the finger at Ukraine.

Source: Simon Shuster, <http://time.com>, 01 February 2018.

NUCLEAR SECURITY

GENERAL

Cyber-Attacks and Rising Risks of an Accidental Nuclear War

The world has crossed over to a new nuclear era in which a fateful error, rather than intentional aggression, is the most likely catalyst to nuclear catastrophe. American leaders have been warned more than once of incoming Russian missiles – in each case, it was a false alarm resulting from technical or human error. Former Russian President Yeltsin was mistakenly alerted to a possible US missile strike after the launch of a Norwegian scientific rocket. After every incident, we deceive ourselves that we can solve the problem with better technology and training, or we reassure ourselves that the combination of diligence and good luck we experienced during the Cold War will continue. But do we really believe we can prevent a nuclear catastrophe indefinitely in a world that has nine states with nuclear weapons and significant suspicion and hostility in many of their mutual relationships?

The risks of human error involving nuclear weapons are compounded by the potential for deliberate cyber threats to warning and command-and-control systems. Hackers could insert a false warning of a nuclear attack into national warning and alert systems and falsely attribute that attack to an innocent country. At a time of heightened

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global tensions, with too little communication or cooperation between nuclear rivals and only minutes of decision time, how would leaders of states with nuclear weapons respond? The Trump administration recently declared plans to broaden the role of nuclear weapons in national defences beyond deterring nuclear attacks on the US and its allies. Its new National Security Strategy states that the arsenal is now “essential” to preventing not just a nuclear attack but also “non-nuclear strategic attacks, and large-scale conventional aggression”. The US Missile Defence Agency conducting the first intercept flight test of a land-based Aegis Ballistic Missile Defence weapon in Hawaii. According to the writers, the US, Russia and other nuclear-armed nations must work together to reduce the risk of a nuclear error as a nuclear ballistic missile cannot be recalled once fired.

A leaked draft of its forthcoming Nuclear Posture Review has similar language. Expanding the range of threats against which nuclear weapons might be used – which implies, for example, “strategic” cyber-attacks - will greatly increase the risks of miscalculation or blunder. If a cyber-attack took out a major part of our electrical grid, would we be able to quickly and confidently identify the attacking country? If Russia, China, India, Pakistan and others adopt similar policies, are we moving down a path where nuclear use becomes highly probable? Every country with nuclear weapons perceives its geopolitical circumstances differently, but we all face substantially increasing nuclear risks. Individually, where necessary, and together where possible, they must move with urgency on policies that can reduce these risks for all nations. We recommend three initial steps.

First, countries with nuclear weapons should continuously review and protect against the vulnerability of their nuclear warning and command systems to cyber threats. The focus

should be on correcting current weaknesses and instituting a process of continuing assessment and updates. Some findings and conclusions could be shared with other nuclear powers - reducing risks for all. Each should recognise that a cyber-attack against nuclear warning and command systems is a prescription for global disaster.

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Second, despite significant disagreements on many global issues, the US, Russia and other nuclear-armed nations must work together on areas of existential common interest - chief among them, reducing the risk of a nuclear error. Once fired, a nuclear ballistic missile unfortunately cannot be recalled before it reaches its target. Removing US and Russian nuclear weapons from Cold War-era “prompt-launch” postures, where they are ready to launch and hit their targets within minutes, would eliminate “hair triggers” and increase decision time for leaders. In doing so, Washington and Moscow would set an example for all states with nuclear weapons. Military experts in each of these countries should be mandated by their leaders to explore this and other options that would give them more time to make fateful decisions about nuclear use.

Third, the US and Russia should reinforce the principle - articulated eloquently by former US president Ronald Reagan and his Soviet counterpart Mikhail Gorbachev - that a nuclear war cannot be won and must never be fought. Have the two largest nuclear powers already forgotten this powerful historical breakthrough that was essential to ending the Cold War? The most immediate priority should be to structure and posture US and Russian nuclear forces to deter nuclear use and reduce the risk of an accidental, mistaken or unauthorised launch.

Against this backdrop, the current Russian concept of “escalate to de-escalate” - that is, limited nuclear use designed to create a pause in the conflict and open a pathway for a negotiated settlement on Moscow’s terms - and US calls for

more “usable” nuclear weapons taken together make the world a vastly more dangerous place. The US must have a safe, secure and reliable nuclear deterrent as long as nuclear weapons exist. But in today’s nuclear era, it is not enough. There is still time for the world to come together to reduce and ultimately eliminate nuclear threats - most urgently by taking action to reduce the risk of an accident, mistake or miscalculation. This should be a core principle and key objective shaping the Trump administration’s nuclear policy.

Source: <http://www.straitstimes.com>, 03 February 2018.

NUCLEAR SAFETY

BELGIUM

Belgium’s Neighbours Fear A Nuclear Incident

In 2017, when the Belgian government revealed that seventy new cracks had been discovered in the boiler of the country’s Tihange 2 nuclear reactor, towns near the country’s borders reacted with exasperation. The power plant lies just 60km from the triple border where Belgium, Germany and The Netherlands meet, close to the Dutch town of Maastricht and the German town of Aachen. These were not the first cracks to be discovered. Tihange is now more than four decades old, but it was built to only have a lifespan of 30 years. Already in 2014 an inspection found thousands of small ‘microcracks’ in the reactor. The neighboring German state of Northrhine-Westphalia became so alarmed that it ordered iodine tablets for German citizens in case of a Belgian nuclear accident. Tihange isn’t the only plant of concern. The Doel 3 reactor, near the Belgian port city of

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German politicians have harshly criticized what they see as Belgian inaction over the safety of its aging plants. And the concern is likely to grow louder following the broadcast of a documentary on German television alleging a series of near-accidents at the Tihange plant.

Antwerp next to the Dutch border, also has cracks. These reactors have been subject to sudden shutdowns which have caused disruption to the Belgian electricity network. The country is 40 percent reliant on nuclear power for its electricity.

In neighboring Germany, nuclear power has remained very unpopular with the public since the 1970s. After the 2011 Fukushima nuclear disaster

in Japan, German Chancellor Angela Merkel decided to phase out nuclear power in the country for safety reasons. But Germany is powerless to do anything about nuclear plants just across its borders, which pose the same safety risks to German citizens as domestic plants would. Nevertheless, German politicians have harshly criticized what they see as Belgian inaction over the safety of its aging plants. And the concern is likely to grow louder following the broadcast of a documentary on German television alleging a series of near-accidents at the Tihange plant.

No Cooperation: But despite the complaints from Dutch and German politicians, a report published in February found that they haven’t made much of an effort to work with their Belgian counterparts to resolve the problem. A Belgo-German cooperation group set up in 2016 has done little to change that situation, it found. The report, published by the Dutch Safety Board, did not address the safety of the

plants but instead the degree to which the three countries are working together on their maintenance and contingency plans in the event of a nuclear incident. It found that though cooperation has been set up on paper, “it probably will not run smoothly if a nuclear accident were to occur in reality.” According to the report, preparations for an incident at the plants varies widely between the three countries. Some have

iodine pills at the ready, others have evacuation instructions that differ from those that would be given to neighbouring populations. In the event of an accident, the report warns, citizens would not know which set of instructions to follow. The result, the report warns, could be “confusion and unrest” – particularly as linguistic and cultural differences are exasperated by an unfolding emergency situation.

For their part, the Belgian government insists that despite the cracks, the reactors are still perfectly safe and the temporary shutdowns have been simply due to an abundance of caution. Nevertheless, the country’s health ministry said in 2016 that it would provide iodine tablets to citizens around the plant, just in case. While many Belgians share their neighbours’ alarm, others feel that they are being used as a political punching bag by neighbouring politicians looking to score cheap points. While there is deep anti-nuclear feeling in Germany and The Netherlands, Belgium has a similarly positive attitude to the power source as its southern neighbour France. In the meantime, people in this triple border region don’t know who to believe. But their attitudes tend to be set by which side of the border they reside in. In the event of a nuclear accident, however, the radiation would affect them all equally.

Source: <https://www.forbes.com>, 04 February 2018.

NUCLEAR WASTE MANAGEMENT

FRANCE / SPAIN

IAEA Assesses Waste Management in France and Spain

At the request of the French government, the IAEA has conducted an integrated review service for

radioactive waste and used fuel management, decommissioning and remediation programmes, referred to as Artemis. Artemis missions provide independent expert opinion and advice, drawn from an international team of specialists convened by the IAEA. Reviews are based on the IAEA safety standards and technical guidance, as well as international good practices.

The mission to France aimed to help the country meet EU obligations that require an independent peer review of national programmes for the safe and responsible management of used fuel and radioactive waste. These assessments must be carried out at least every ten years. It is the second Artemis carried out to meet EU obligations, following a mission to Poland last October.

The 11-day mission concluded on 24 January and comprised 13 experts from Belgium, Canada, Cuba, Finland, Germany, the Netherlands, Spain and the UK, as well as three IAEA staff members. The mission was hosted by the Directorate General of Energy and Climate (DGEC) with the participation of

officials from several organisations, including the French National Radioactive Waste Agency (Andra) and the Nuclear Safety Authority (ASN).

The Artemis team said France is “well positioned to continue meeting high standards of safety”. The mission noted a number of good practices to be shared with the global waste management community. These included a clear government commitment to the national strategy and programme for waste management, including safe disposal. France, the team found, has developed a transparent national waste inventory and has made deliberate efforts towards maintaining a high level of professional, competent staff.

The mission also made suggestions for France to

France, the team found, has developed a transparent national waste inventory and has made deliberate efforts towards maintaining a high level of professional, competent staff. The mission also made suggestions for France to further enhance its waste management programme. It suggests France facilitates implementation of the requirement for decommissioning to take place in the shortest time possible and also to optimise management of very low level waste.

further enhance its waste management programme. It suggests France facilitates implementation of the requirement for decommissioning to take place in the shortest time possible and also to optimise management of very low level waste. The team suggests the country considers mechanisms to address disposal liabilities for small waste producers. ASN said the team's suggestions will be taken into account in

the preparation of the next National Radioactive Material and Waste Management Plan, which will be subject to in-depth consultation with the stakeholders and the public. ... On 25-26 January, Spain's Nuclear Safety Council (CSN) hosted a preparatory meeting for IAEA to carry out combined Artemis and Integrated Regulatory Review Service (IRRS) missions in October.

Source: World Nuclear News, 09 February 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 Vinod Patney, SYSM PVSM AVSM VrC (Retd).

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