



A FORTNIGHTLY NEWSLETTER ON NUCLEAR DEFENCE, ENERGY AND PROLIFERATION FROM
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OPINION – Manpreet Sethi

Nuclear Policy & Diplomacy – 3 Years of the Modi Government

Democracies often undergo swings in policies with a change of government. India's nuclear policy, however, in both its dimensions - weapons and power generation – has enjoyed broad support across political parties. The pace of development of these programmes may have varied depending on the personal inclination of the leadership, but the general direction of the policies has mostly remained the same irrespective of the party in power. India's ability to conduct nuclear tests in 1998 was enabled by the continued support given to the programme by leaders of all hues while occupying the prime minister's chair between 1948-98.

More recently, the broad-based consensus on nuclear weapons-related issues has been demonstrated through the continuing validation of India's nuclear doctrine. This was first articulated in 1999 (and officially accepted with slight revisions in 2003) under the NDA government led by Prime Minister Atal Bihari Vajpayee. The change of administration in 2004 with the coming in of the UPA government headed by Dr Manmohan Singh did not lead to any alteration in the doctrine over his terms (2004-2014). Subsequently, PM

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Narendra Modi has yet again expressed his support for the doctrine despite the noise made by his party during the election campaign about a possible doctrinal revision.

The PM's endorsement of the doctrine, especially its attribute of NFU early in his tenure was the right move to set the record straight on India's nuclear strategy. Given that India believes that nuclear weapons are meant to deter use of similar weapons, the principle of NFU is grounded in sound political and military logic. Using them first is sure to bring back nuclear retaliation from India's nuclear-armed adversaries, both of whom have secure second strike capabilities.

Hopefully, India's leadership will continue to understand and uphold this simple logic even as India is passing through not-so-benign nuclear developments in the neighbourhood. Even if the adversaries develop ostensibly counterforce capabilities, the NDA government would do the country a favour by steadfastly declining to go down the route of nuclear war-fighting.

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Instead of effecting any doctrinal changes, the focus of India's nuclear strategy must be on capability build-up to further the survivability and reliability of the nuclear arsenal and to lend credence to the promise of assured retaliation. To its credit, the NDA government has retained the momentum on capability as evident in the regular testing of delivery systems. Its focus has also rightly been on the full operationalisation of INS Arihant as well as making future additions more potent to enhance the credibility of deterrence.

As regards India's nuclear power programme, the NDA inherited the major breakthrough achieved through a full operationalisation of the Indo-US civilian nuclear cooperation agreement, including a waiver granted by the NSG to its members to do nuclear trade with India. The UPA had already captured the new opportunities through the signing of the MoU on peaceful nuclear cooperation with as many as 11 countries by 2011. However, the nuclear accident at Fukushima and the subsequent enactment of the Civil Liability Nuclear Damage Act (CLNDA), which was imbued with many strict provisions that the nuclear industry considered unfriendly for investment, significantly slowed India's ability to encash the cooperation agreements.

On its occupation of the seat of power, the NDA - whose main constituent party, the BJP, when in opposition had been responsible for the stridency

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of the CLNDA – began to take steps to resolve some of the hurdles to the rapid expansion of India's nuclear energy programme. In order to address liability concerns, the government issued new clarifications on the provisions in 2015, besides creating an insurance pool to assure nuclear industry in 2016. PM Modi also used his visits to the major

nuclear supplier countries to allay their fears. However, the results have been slow, running into further problems because of the flux in international nuclear industry. Even as price negotiations with AREVA were being worked out, it was taken over by Electricite de France (EdF). Organisational and procedural realignments at their end are sure to slow the finalisation of the contract with India. Meanwhile, in another blow, Westinghouse declared bankruptcy earlier this year, placing in jeopardy India's cooperation with the Toshiba-Westinghouse consortium.

Owing to these developments, India has not yet been able to start construction of any imported reactor. However, in an attempt to keep some of the targets on track, the NDA government has approved the construction of 10 indigenous nuclear

power plants of 700 MWe each. This is a good move and will boost local nuclear industry. In fact, it would be best if the NPCIL, the national nuclear builder and operator, is able to show the capacity to build these plants with no financial overruns and time delays since nuclear power is today competing in the mind space with fast expanding renewable energy.

One major disappointment for the NDA has been its inability to secure NSG membership for India. On this issue, they seem to have run into the China Great Wall even as proactive Indian nuclear diplomacy was able to bring around some of the other countries that had earlier expressed

reservations about India's inclusion. China, however, remains intransigent for now and some clever diplomacy will be required to make a breakthrough here.

One such idea could be to prepare India to step into the nuclear export market with its own wares. India could be a nuclear supplier even without being an NSG member. It certainly has the requisite expertise especially in small and mid-sized nuclear reactors that could be suitable for many countries. In case the need for financial and fuel support to enable export of Indian nuclear reactors is felt, India could explore the possibility of partnering with some other nuclear suppliers such as Rosatom or even a Chinese company. In the next two years, the NDA administration could put in place a nuclear export strategy for India and provide a new direction and momentum to national nuclear policy and diplomacy.

Source: IPCS Special Report #191, http://www.ipcs.org/pdf_file/issue/Modi_Compendium_Final.pdf

OPINION – Ramesh Thakur

China and the North Korean Nuclear Challenge

On a superficial reading, China is feeling the squeeze to take effective action to bring North Korea to heel over its rogue nuclear program. On a deeper reading, China's gains from the crisis exceed the costs. On a wider reading, Washington daily vindicates Pyongyang's nuclear choices.

In July 2017, Pyongyang demonstrated technical capability to launch ICBMs that put US mainland

cities within reach. The trigger to the latest tit-for-tat brinkmanship is revised US intelligence

assessments that North Korea has miniaturized warheads to fit them on the missiles, and may already possess 60 bombs.

China is at a critical inflection point in its upwardly mobile trajectory. Its long-term strategic vision and political stability have underpinned sustained economic growth and dramatic expansion of comprehensive national power. This has substantially bolstered its voice and role in regional and global governance.

Permanent membership of the UNSC adds to its structural weight in managing world affairs.

But China is still only a middle income country. At \$8,000, its GDP per capita is only one-seventh that of the US and it ranks 72nd in the world. Its dramatic growth and massive population are projected forward and the prospective power potential conditions the expectations of China as a global leader today. But at present China lacks the material capacity to meet such elevated expectations. Stability and conflict-avoidance in its immediate region remains a vital national interest for China's development and peaceful rise.

Heightened tensions over North Korea's nuclear antics risk an uncontrolled armed conflict, strengthened US-Japan-South Korea alliances and enhanced prospects of nuclear breakouts by Japan, South Korea and Taiwan.

But China's leverage over Pyongyang, although greater than that of others, is limited. Pyongyang has proven indifferent to what others think and impervious

to external pressure. With 80 percent of trade with China, more UN sanctions amount to more

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China's leverage over Pyongyang, although greater than that of others, is limited. Pyongyang has proven indifferent to what others think and impervious to external pressure. With 80 percent of trade with China, more UN sanctions amount to more sanctions on China. It is cost-free for Washington and Western countries to engage in virtue signaling by enacting still tougher international sanctions whose costs have to be borne by China.

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If the sanctions succeed in destroying North Korea's economy and engineer a collapse, millions of desperate refugees will flood into China and a crucial geographical buffer against US forces will disappear.

By what right does Washington tolerate nuclear weapons in the hands of its ally Israel but demand that China force a rollback of North Korea's? In Beijing's eyes, the US provokes a crisis but holds China responsible for solving it. US threats also stir memories among elderly Chinese of how they were treated in the early years of China's own nuclear program.

Any further weakening of Pyongyang's links with Beijing and Moscow will feed North Korea leader Kim Jong Un's siege paranoia and solidify reliance on nuclear weapons as the only assured guarantee of regime and personal survival. The US record of infidelity to political package deals — the 1954 Geneva accords on Indochina, understandings with Russia on Eastern Europe on ending the Cold War, Libyan leader Moammar Gadhafi's abandonment of his nuclear program — inspires distrust. Every fresh bellicose threat from Washington deepens Pyongyang's dependence on and attachment to a nuclear deterrent that can strike the US mainland.

On balance, therefore, in China's calculation the status quo of a nuclearized North Korea, however unpalatable, is preferable to the upheaval that would result from military strikes or regime collapse. This is consistent with the sober conclusion of The Economist that all options for

dealing with North Korea are bad but blundering into a war would be the worst.

Nothing in North Korea's history indicates its leadership is suicidal. Conversely, Donald Trump's career to date does not inspire confidence in the

quality of his decision-making. On nuclear policy he is positively terrifying in proving with each new tweet how ignorant, reckless and a threat to world peace he is. In a 37-country global survey of 40,448 people, 62 percent considered him dangerous and only 26 percent thought he is fit to be US president.

The recent Trump-Kim exchange of inflammatory rhetoric highlighted both as blustering megalomaniacs who pose a clear and present danger to world peace. Kim may already have achieved one major goal of being treated as an equal by the US. On 15 August 2017, South Korean President Moon Jae-in warned publicly that any action against the North would require his consent and he renewed calls for dialogue with the North. But the frightening reality is that Trump would not face any domestic checks on his untrammelled authority to use nuclear weapons. The existing protocol has been designed for speed and efficiency, not deliberation, and permits the president to launch nuclear weapons with a single verbal order.

By contrast, Chinese President Xi Jinping is the very model of a circumspect, calm and statesmanlike leader urging restraint in rhetoric

and action by both sides and calling for a phased program (freeze-for-freeze) to reduce tensions. Each new step on the escalation ladder does further damage to the US reputation for responsible leadership while boosting China's profile and prestige. It also obscures China's own past culpability in enabling North Korea's nuclear program while underlining the history of US

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forcible regime change as the main driver of Pyongyang's nuclear pursuit.

This, in turn, amplifies the larger narrative of the diminishing US presence in Asia, weakening its alliance system and sowing doubts about the reliability and quality of US decision-making. Retaliatory trade measures against China would cause substantial damage to the US economy and also to US allies in global supply chains that run increasingly through China.

Japan and South Korea have managed to live for years with the reality of vulnerability to North Korea's nukes. There is no reason why the US cannot learn to do the same. Kim should be left in no doubt that an attack on any of the three allies would bring instant military strikes and elimination of the regime. But there will be no preventive strikes. Instead a policy of containment — which requires credible threats, not bluster — will be instituted along with risk avoidance and crisis stability measures that served all sides well during the Cold War....

Source: Japan Times, 17 August 2017.

OPINION – Stanly Johny

Reading Kim Jong-un's Mind

Is North Korea's leader Kim Jong-un a "crazy fat kid" and a "total nut job", as US President Donald Trump has described him, or is he a rational leader who makes his foreign policy choices to protect the interests of his regime? Every discussion around the North Korean nuclear crisis could eventually settle around this basic question. If he is an irrational, crazy and impulsive leader, it's difficult to reach a diplomatic settlement with him. A military solution to the North Korean issue is even more difficult and risky as Mr. Kim could use the country's nuclear arsenal in retaliation.

That's a cul-de-sac. On the other hand, if there's a strategy behind Mr. Kim's perceived madness, it at least opens avenues for further engagement.

Most accounts of the Korean crisis are written from the perspective of Pyongyang's rivals where an erratic, despotic regime is portrayed as relentlessly pursuing dangerous weapons in defiance of international public opinion and sanctions. But if one looks at the whole issue from a North Korean security point of view, it is not hard to find a method behind the North's actions.

It is not hard to find a method behind the North's actions. It's a country that's been technically at war with its neighbour for almost seven decades. There are also multiple US bases in South Korea, the Philippines, Japan, Guam Island and a naval presence in the East China Sea and the Pacific, in the vicinity of North Korea. In terms of conventional military might, the impoverished North knows that it's no match for the US. This has forced it to make extreme choices to overcome the asymmetry in capabilities.

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asymmetry in capabilities.

This strategic insecurity was reinforced in the 1990s when Russia became a directionless, timid, floating power after the disintegration of the Soviet Union and China gradually moved closer to the US. These were the only allies North Korea had. In 1992, China established formal relations with South Korea, which deepened Pyongyang's concerns. Adopting a two-pronged strategy, it fast-tracked its missile and nuclear programmes and expressed a willingness to negotiate. The purpose, as it seems now, was to prompt world powers, mainly the US, to sit down to talk and make assurances on security. This strategy met with success as the Clinton administration responded constructively. In 1994, Pyongyang agreed to freeze the operation and construction of nuclear reactors in line with the Agreed Framework signed with Washington. In return, the

US promised two proliferation-resistant nuclear reactors.

The George W. Bush administration took a hawkish stance towards Pyongyang. In 2002, Mr. Bush lumped North Korea with Iraq and Iran in the "Axis of Evil". Pyongyang withdrew not only from the Agreed Framework but also from the NPT, and accelerated efforts to gain nuclear weapons. With President Barack Obama following the tested and failed policy of sanctions and intimidation, the North steadily expanded its military capabilities.

And now, Donald Trump has to deal with a North Korea equipped with nuclear bombs and intercontinental ballistic missiles that can reach US territory.

Both the diplomatic and military options are now a lot more difficult than those in the early 1990s. A limited attack by the US could snowball into a full-fledged

nuclear war, threatening millions in East Asia. The North's nuclear facilities are spread across its mountainous regions making it difficult to destroy them. So are the country's missile capabilities, which reportedly have mobile launchers that could survive an attack on defence bases. There are thousands of pieces of artillery along the Demilitarised Zone that could be used to attack Seoul which lies roughly 50 km from the border.

For a diplomatic solution, the North will have to make great compromises. In the 1990s, North Korea was an aspiring nuclear power and all it needed to surrender was its ambition in return for security. Now that it is a nuclear power, will it abandon its nuclear weapons in return for security assurances? It's unlikely to happen as the examples of Iraq and Libya show. Both Saddam Hussein and Muammar Qadhafi, respectively, had given up their nuclear ambitions, saw their regimes toppled by Western invasions and then were killed. Even the example of Iran would not be encouraging for North Korea. Tehran agreed to curb its nuclear activities and open its reactors

for routine international inspections in return for the lifting of international sanctions during the Obama presidency. The Trump administration has taken an extremely hostile view, added more sanctions on Tehran, joined hands with its regional rivals, and even threatened to cancel the certification of Iran's compliance with the nuclear deal. Mr. Kim would be asking himself how he could trust American security assurances even if they come by.

China Template: North Korea would rather prefer a Chinese model. China exploded its first nuclear bomb in 1964, which led to it being treated as a rogue nuclear power. But China was accepted into the mainstream international order in the 1970s. Even the US, its main rival, initiated a diplomatic process with Beijing. Mr. Kim may be betting on both his nuclear deterrence as well as his chances of being accommodated as a nuclear power in the international system, a game of chicken scenario. Conflict is inevitable if the US and North Korea keep going down the path they are now on. If one swerves, the other will benefit. But will both swerve for a tie and re-launch a diplomatic process afresh.

Source: *The Hindu*, 17 August 2017.

OPINION – Alexandro Pando

Can Next-Generation Nuclear Power Meet World Energy Needs?

As the construction and adoption rates of nuclear facilities slow down globally, now more than ever it seems nations are gradually phasing out nuclear energy as a choice replacement option for fossil fuel-derived energy sources. The exit of industry leaders like Siemens, Toshiba's recent \$6.3 billion loss and the lack of interest in nuclear power reactors resonate this assertion. Alternative options for global power generation are being heavily investigated and include nuclear fusion,

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geothermal, and carbon capture and sequestration, but these alternatives are still in the developmental stage. Nuclear power is a viable option, and next-generation reactors (expected to be deployed between 2020-2030) represent advancements in sustainability, economics, safety, reliability and proliferation resistance.

Going against the trend, China has continued to amplify its nuclear energy investments. It holds the title of being the world's largest emitter of CO₂, so it comes as no surprise that its government has set aside a sky-high figure of \$361 billion for the development of cleaner energy sources. Of this lump sum, the country plans to utilize approximately \$78 billion to construct 35 reactors in the next four years. Many reasons can be posited to justify China's commitment to nuclear, but perhaps the most appropriate is the fact that nuclear power presents a clear-cut pathway to producing stable, clean and high-density energy. Unlike other renewables, nuclear power is not subject to seasonal variations. Once installed, reactors go on to produce energy within their rated capacity consistently. In other words, throughout their years of active service, their drop in efficiency is almost negligible.

How Efficient Are Wind and Solar? With regard to efficiency, the same cannot be said for wind and solar. Solar and wind power systems typically feature a capacity factor of 20% compared to nuclear-powered plants with an average capacity factor of over 90%. What this means is nuclear reactors would produce 90% of their rated energy capacities at all times compared to solar/wind,

which only provides 20%, a figure that is still subject to fluctuations due to climate and weather. Then there's the issue of compatibility. For generated power to reach the end consumer, it has to be transmitted, and while nuclear power plants connect seamlessly to already existent power grids, solar and wind farms require converters to bridge with the grid in most instances. The cost implications of this and other significant modifications like the implementation of smarter grids to facilitate redundancy make nuclear power more scalable and cost-efficient.

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Energy Prices are Rising to Foster Development of Other Renewables: A survey of countries that rely majorly on nuclear energy sources shows that electricity retails at a below-average price in comparison to countries where other renewables

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are more prominent. In countries like Germany, the surge in consumer power prices is attributed to a number of factors, chief among them being the increase in taxes levied to aid the subsidy of renewables and the systematic decommissioning of operating nuclear plants. Shutting down nuclear power plants drive up energy costs, an indication

that renewables cannot sustain current global power needs (at least for now). In the US, accompanying the rise in cost as a result of nuclear power plant shutdowns is a marked increase in greenhouse emissions, because gas plants are the more likely replacements for decommissioned nuclear power stations.

Source: <https://www.forbes.com>, 16 August 2017.

OPINION – Steven Ashley

Thorium Could Power the Next Generation of Nuclear Reactors

A Dutch nuclear research institute has just fired up the first experiment on next-generation nuclear reactors based on thorium in nearly half a century. Thorium has long held promise for “safer” nuclear power. A slightly radioactive element, it converts to fissionable U-233 when hit by high-energy neutrons. But after use, U-233 has fewer long-lived waste products than conventional U-235 now used in nuclear power plants. It’s also exceedingly difficult to reprocess thorium into plutonium.

But because nuclear power was traditionally tied up with nuclear weapons research, thorium was abandoned. Except for one test reactor that has been under construction in India since 2004, the last research into thorium reactors took place 45 years ago.

But now, NRG, a nuclear research facility on the North Sea coast of the Netherlands, has launched the Salt Irradiation Experiment (SALIENT) in collaboration with the EU Commission. The researchers want to use thorium as a fuel for a molten salt reactor, one of the next generation designs for nuclear power.

Molten salt reactors are expected to be very well suited for using thorium as a fuel. The unique fluid fuel can incorporate thorium and U-233 fluorides as part of a salt mixture, to melt at very high temperatures. The Petten team will melt a sample of thorium salt fuel to see if, over time, the neutron bombardment triggers the nuclear reactions necessary to transmute the thorium into uranium isotopes that can undergo nuclear fission, and sustain the chain reaction needed to generate energy.

If they can produce this cleaner reactor fuel, the next step is to study tough metal alloys and other materials that can survive the bombardment.

Later research will examine how to deal with the waste from a molten salt thorium reactor. While safer than the long-lived products from a standard nuke, these will still need special disposal.

If this project bears fruit, there are many interests waiting to join the thorium club. A US startup based in Utah says it’s developing a thorium reactor, the first in the US in half a century, and a consortium of eastern Utah counties is exploring whether to participate in the project. So is thorium really back on the table? We’ll know by the end of the year, if the Kalpakkam test reactor in India starts generating energy. We need clean energy sources to stave off climate change, yet fears raised by Fukushima have caused nuclear power to stagnate. Maybe thorium’s time has finally come.

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Source: <https://www.newscientist.com/a>, 25 August 2017.

OPINION – Kyle Mizokami

Great Britain’s Nuclear Weapons Could Easily Destroy Entire Countries

The United Kingdom maintains a fleet of four ballistic missile submarines with the ability to devastate even the largest of countries. This fleet came into being after its ally, the US, canceled a key weapon system that would have been the cornerstone of London’s nuclear arsenal. Fifty years later, the UK’s missile submarine force is the sole custodian of the country’s nuclear weapons, providing a constant deterrent against nuclear attack.

The United Kingdom’s nuclear force in the early 1960s relied upon the so-called “V-Force” strategic bombers: the Avro Vulcan, Handley Page Victor and Vickers Valiant. The bombers were set to be equipped with the Skybolt air-launched ballistic missile, which could penetrate Soviet defenses at speeds of up to Mach 12.4 (9,500 miles an hour). Unfortunately technical problems plagued Skybolt, and the US government canceled the missile in 1962.

Skybolt's cancellation threatened to undo the UK's entire nuclear deterrent, and the two countries raced to come up with a solution. The US agreed to offer the new Polaris submarine-launched ballistic missile to replace Skybolt. The United Kingdom had no missile submarines to carry Polaris—it would have to build them.

A study by the Ministry of Defense concluded that, like France, the UK would need at least five ballistic missile submarines to maintain a credible deterrent posture. This number would later be reduced to four submarines. Like the French Le Redoutable class, the submarines would bear a strong resemblance to the US Navy's Lafayette-class ballistic missile

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submarines, with two rows of eight missiles tubes each behind the sail. Unlike Lafayette and Le Redoutable, the new submarines of the Royal Navy's Resolution-class would have their hydroplanes on the bow, with the ability to fold up when parked along a pier.

Most of the submarine was British, with two built by Vickers Armstrong at Furness and two by Cammel Laird at Birkenhead. The missiles, missile launch tubes and fire control mechanisms, however, were built in the US. Each submarine was equipped with sixteen Polaris A-3 submarine-launched ballistic missiles. The Polaris had a range of 2,500 miles and was originally equipped with a single British warhead. A midlife improvement for the missile, Polaris A-3TK, replaced the single warhead with six Chevaline multiple independently targetable warheads of 150 kilotons each.

The first submarine, HMS Resolution, was laid down in 1964 and commissioned in 1967, followed by Repulse and Renown, commissioned in 1968, and the aptly-named Revenge in 1969. Resolution first successfully launched a missile off the coast of Florida in February 1968.

In the early 1980s, it became clear that the Resolution class would eventually need

replacement. Despite the end of the Cold War and the dissolution of the Soviet threat, London held firm and built all four ships. The UK again decided to build its own submarines and outfit them with American missiles. The result was the four Vanguard-class submarines: Vanguard (commissioned in 1993), Victorious (1995), Vigilant (1996) and Vengeance (1999). Vanguard carried out her first Trident II missile firing in 1994, and undertook her first operational patrol in 1995.

At 15,000 tons displacement, the Vanguards are twice the size of the Resolution class that preceded them. Although each submarine has sixteen launch tubes, a decision was made in 2010 to load each sub with

just eight American-built Trident II D-5 submarine launched ballistic missiles. The Trident II D-5 has a range of 4,600 miles, meaning it can strike targets across European Russia with ease. Each D-5 carries eight multiple independently targetable warhead 475 kiloton thermonuclear warheads, giving each submarine a total of thirty megatons of nuclear firepower.

UK missile submarine crews, like their American counterparts, maintain two crews per boat to increase ship availability. Under a program known as Continuous At Sea Deterrence (CASD) at least one submarine is on patrol at all times, with another coming off patrol, another preparing for a patrol and a fourth undergoing maintenance. According to the Royal Navy, CASD has not missed a single day in the last forty-eight years without a submarine on patrol.

In 2016, the Ministry of Defense announced the next generation of nuclear-powered ballistic missile submarines, dubbed Successor, would be the Dreadnought class. The Royal Navy will build four Dreadnought-class subs, each weighing 17,200 tons, with construction beginning in September 2016. Each will have twelve missile tubes instead of sixteen, and the subs will recycle the Trident II D-5 missiles from their predecessors.

The Dreadnought boats are expected to enter service in the 2030s and have a thirty-year life cycle. The ministry expects the new submarines to cost an estimated \$39 billion over thirty-five years, with a \$12 billion contingency. The introduction of the third generation Dreadnought class will provide the UK with a powerful strategic deterrent until the 2060s and possibly beyond.

At any one time, at least sixty-four of the UK's nuclear weapons are somewhere at sea, ready to launch within minutes of warning. While nowhere near as powerful as the US strategic deterrent, the nuclear weapons are more than enough to prevent any opponent from launching a surprise attack. The Royal Navy's ballistic missile submarines carry on the service's centuries-old mission of protecting the country from the sea.

Source: <http://nationalinterest.org/>, 26 August 2017.

OPINION – Moshe Arens

The Results of the Iran Nuclear Deal

A little more than two years after the signature of the Joint Comprehensive Plan of Action between Iran and the five permanent members of the UNSC plus Germany. It is time to take stock of what the results are so far.

Iran is not a nuclear power at the moment but has the capability to become one on relatively short notice. It has continued to develop its ballistic missile arsenal, whose primary objective is to launch nuclear warheads against those Iran considers its enemy. And Iran, relieved of the economic sanctions that

had forced it into the negotiations, has used resources that have become available to project its power in Iraq, Syria, Lebanon and Yemen. It keeps threatening Israel.

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It is arguable just how quickly Iran could go nuclear if it so decides. Iranian President Hassan Rohani recently declared to the Iranian parliament that "Iran could return to conditions more advanced than before the negotiations within hours." Even discounting some of this as bluster aimed at his enemies at home and

abroad, the time required for Iran to go nuclear would be at most a few months.

The nuclear deal neglected to address Iran's ballistic missiles, and ignored Iran's well-known ambitions to become the dominant power in the Middle East. Barack Obama, the architect of the agreement with Tehran, then stood by while the slaughter in Syria continued, and Iran and Russia moved in to take over. Now the Iranians and their proxy, Hezbollah, are approaching Israel's borders.

As Benjamin Netanyahu said at the time, it was a bad deal. Bad for Israel and bad for the world.

The prime minister did his level best to prevent the confirmation of the agreement by the Congress of the United States.

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There was general agreement in Israel that it was a bad deal, but Netanyahu's appearance before both houses of Congress came in for criticism from the opposition. He is going to ruin Israel's relations with the United States, Israel's

only friend and ally, it was claimed. This will be the end of bipartisan support for Israel in the Congress, it was argued.

Actually, he did what was incumbent upon an Israeli prime minister to do: make his best efforts to try and stop a deal that would cause damage to Israel's interests. The U.S.-Israeli relationship has not only survived his appearance before the U.S. Congress, but it is better today than it has been in a long time. And support for Israel in the Congress continues to be, as it has been for many years, bipartisan – Democratic and Republican. There are some lessons to be learned from this short-sighted view of the Israeli-U.S. relationship that was adopted by so many at the time. It is true that the task of the opposition is to oppose, but not at the cost of losing sight of Israel's most vital interests.

Now Israel is stuck with contending with growing Iranian influence approaching its borders. To the threat of over 100,000 Hezbollah rockets and missiles in Lebanon has been added the danger of Hezbollah and Iranian militias attempting to approach the Golan Heights. If not the direct result of the nuclear deal with Iran, it has certainly been compounded by that agreement. The dangers to Israel implied by it were simply ignored by Obama and the other signatories, and now Israel, although dealing with a much more friendly administration in Washington, is left to its own devices.

Everyone has to be put on notice that Israel is fully aware of the approaching danger and will not hesitate to deal with it before it is too late. Netanyahu's visit to Sochi was intended to let President Vladimir Putin know in no uncertain terms that Israel will not stand by impassively as the dangers accrue. This time the opposition seems to agree.

Source: <http://www.haaretz.com/opinion/.premium-1.809345>, 29 August 2017.

NUCLEAR STRATEGY

GERMANY

Germany's Schulz Demands US Withdraw Nuclear Weapons

The center-left candidate for chancellor in Germany's September 2017 election demanded

that US nuclear weapons be withdrawn from the country, taking an increasingly anti-American tack in a campaign season overshadowed by the European discontent with President Donald Trump.

Martin Schulz of the Social Democrats, the challenger to incumbent Chancellor Angela Merkel ... said that the "upper limit for nuclear weapons in our country must be zero." He was elaborating on comments he made at a campaign rally in southwest Germany on which he promised that, as chancellor, he would "work to make sure that nuclear weapons stored in Germany be withdrawn."

...The new demand represented one of Mr. Schulz's most ambitious attempts yet to leverage German opposition to Mr. Trump into an electoral advantage as he trails Ms. Merkel by double digits in the polls. While the Social Democrats have often been more critical of the US than Ms. Merkel's center-right Christian Democrats, they have long supported the trans-Atlantic alliance. It was a Social Democratic chancellor, Helmut Schmidt, who backed a Western plan

during the Cold War to base US nuclear-tipped missiles in Germany should disarmament talks with the Soviet Union fail.

The US keeps nuclear warheads in five European countries, including Germany, according to the Federation of American Scientists and the Congressional Research Service. The US military has a policy of not commenting on the location of its nuclear arsenal in Europe, and German officials also declined to comment on the presence of US nuclear weapons in the country. About 150 B61 nuclear bombs are stored at six different European bases, according to FAS.

...A spokeswoman for Merkel signaled that the chancellor wouldn't be echoing Mr. Schulz's demand. While Ms. Merkel wants to see a nuclear-weapon-free world, "there continues to be a need for nuclear deterrence" as long as other countries see nuclear weapons as a means of military conflict, the spokeswoman said.

The dispute over nuclear weapons was the latest example of Europe's response to Mr. Trump—who is deeply unpopular here, polls show—becoming

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a German campaign issue. Mr. Schulz has said he opposes the NATO goal, often repeated by Mr. Trump, that member countries spend at least 2% of their gross domestic product on defense. Germany signed on to that goal in 2014, and Ms. Merkel reiterated that she will stick to it if she wins a fourth term in the Sept. 24 general election.... "An America that does not care

about the world but only about itself will not be a great America," Ms. Merkel said in an onstage interview with the newspaper Handelsblatt.

Source: Julian E. Barnes contributed to this article in Brussels, The Wall Street Journal, 23 August 2017.

JAPAN-USA

Japan to Seek Assurance of US Defense Pledge, Including Nuclear Deterrence

Japan's defense chief and foreign minister will meet their US counterparts on 14 August 2017 to reaffirm Washington's commitment to defending Japan, including the use of its nuclear deterrent, as threats from North Korea intensify. Japan's Minister of Defence, Itsunori Onodera, and Minister of Foreign Affairs, Taro Kono, travel to the US capital for "two-plus-two" meetings with Defense Secretary Jim Mattis and Secretary of State Rex Tillerson....

The meetings come with tensions high in East Asia with North Korea threatening to fire missiles into the waters close to the US Pacific territory of Guam.

The missiles would have to fly over Japan to reach their target worrying Tokyo that warheads or missile debris could fall on its territory. US President Donald Trump has warned of "fire and fury" if North Korea threatens the US, and said the US military is "locked and loaded".

...Under Japan's alliance treaty with the US, Washington has pledged to defend Japan. It has

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com/, 14 August 2017.

USA-SOUTH KOREA

US Open to More Powerful South Korean Missiles

The US Department of Defense is currently reviewing a request by the Republic of South Korea to allow it to develop more powerful ballistic missiles amidst rising tensions over North Korea's growing military capabilities.

"There is currently a limit on the warhead size and missiles that South Korea can have and yes, it is a topic under active consideration here," Pentagon spokesman Captain Jeff Davis told reporters on 07 August 2017....

In an August 7 phone conversation, South Korean President Moon Jae-in asked his US counterpart, President Donald Trump, to revise the guidelines and allow for the development of payloads of up to 1,000 kilograms (2,200 pounds). "President Trump expressed his position to actively support the move.

put Japan under its nuclear umbrella, meaning it could respond to any attack on Japan with atomic weapons. A renewed commitment by Washington to that promise would reassure Tokyo as it looks to bolster its defenses against possible North Korean military action.

Source: Reporting by Tim Kelly; Editing by Michael Perry, ps://www.reuters.

In a bilateral agreement signed in 1979, the US and South Korea set out guidelines about the specific payload and range of the latter's domestically developed missiles in order to avoid a regional arms race. These guidelines were updated in 2012. However, while South Korean missiles can have now an extended range of up to 800 kilometers (about 500 miles), the maximum payload remains unchanged at 500 kilograms (1,102 pounds).

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Trump expressed his position to actively support the move," a South Korean government spokesperson said following the conversation between the two heads of government, according to Yonhap News.

The Pentagon is now reviewing the guidelines in consultation with the US State Department to determine next steps.... The South Korean military's ballistic missile arsenal currently consists of the Hyunmoo 2A and 2B surface-to-surface missiles. The Hyunmoo 2A has an estimated range of 300 kilometers, whereas the Hyunmoo 2B can hit targets at a distance of over 500 kilometers. Both ballistic missiles carry a payload of around 500 kilograms.

South Korea is also working on fielding an extended range Hyunmoo 2 missile with an estimated range of 800 kilometers. The last test launch of this new missile, likely to be designated the Hyunmoo 2c, took place on 23 June 2017 and was overseen by South Korean President Moon Jae-in. The new missile is expected to become operational by the end of 2017.

The 2C is essentially an upgraded 2B ballistic missile armed with a 500 kilogram payload. The 2C, however, could be modified to accommodate a heavier warhead. Precision-guided ballistic missiles armed with a 1-ton warhead will likely have a bigger chance penetrating leadership bunkers and other underground facilities in the North. "The deep precision-strike capable missiles are part of Seoul's deterrence strategy vis-à-vis Pyongyang, known as Korea Massive Punishment & Retaliation (KMPR)"

Source: *The Diplomat*, 16 August 2017.

NUCLEAR ENERGY

GENERAL

UN Nuclear Watchdog Opens Uranium Bank in Kazakhstan

The IAEA opened a uranium bank in Kazakhstan on 29 August 2017, a \$150-million facility

designed to discourage new nations from enriching the nuclear fuel. The LEU Bank in the city of Oskemen, in eastern Kazakhstan, will store up to 90 tonnes of the fuel, enough to power a large city for three years, and sell it to IAEA members if they are unable to procure it elsewhere.

"The LEU Bank will serve as a last-resort mechanism to provide confidence to countries that they will be able to obtain LEU for the manufacture of fuel for nuclear power plants in the event of an unforeseen, non-commercial disruption to their supplies," IAEA Director General Yukiya Amano said in a statement.

Countries such as Iran have said they need enrichment facilities to ensure a steady supply of fuel for nuclear power plants, and the idea behind the bank is to make such supply available without domestic enrichment.

Russia has operated a similar bank since 2010 but the one in Kazakhstan will be the first one fully owned and operated by the global nuclear watchdog.

"By hosting the IAEA LEU bank, Kazakhstan has made another contribution to strengthening the global non-proliferation regime," Kazakh President Nursultan Nazarbayev said as he handed Amano a symbolical key to the facility at a ceremony in the Kazakh capital, Astana.

... The IAEA said in a statement it would begin buying uranium soon, with the aim to ship it to the bank next year. The project was funded by donors, including the United States, the European Union, Kuwait, the United Arab Emirates, Norway and the Nuclear Threat Initiative.

Source: <https://www.usnews.com>, 29 August 2017.

JAPAN

Three More Japanese Reactors Step Closer to Restart

Japan's nuclear regulator approved the 'construction plans' for strengthening Ohi units 3

A \$150-million facility designed to discourage new nations from enriching the nuclear fuel. The LEU Bank in the city of Oskemen, in eastern Kazakhstan, will store up to 90 tonnes of the fuel, enough to power a large city for three years, and sell it to IAEA members if they are unable to procure it elsewhere.

and 4 and Genkai unit 3. The plans are the second of three applications required during the restart process. The units must undergo further inspections before being permitted to restart.

Under Japan's reactor restart process, plant operators are required to apply to the Nuclear Regulation Authority (NRA) for: permission to make changes to the reactor installation; approval of its construction plan to strengthen the plant; and, final safety inspections to ensure the unit meets new safety requirements. Operators are required to add certain safety-enhancing equipment within five years of receiving the NRA's approval of a reactor engineering work program.

Kansai Electric Power Company submitted its construction plan application for units 3 and 4 of its Ohi plant in Fukui prefecture to the NRA in July 2013. It supplemented this application with additional information the following month and subsequently submitted five amendments. The construction plan for unit 3 of Kyushu Electric Power Company's Genkai plant in Saga prefecture was also submitted to the NRA in July 2013. The company subsequently made four amendments to the application. In January this year, the NRA confirmed Genkai 3 and 4 - both 1180 MWe PWRs - meet new regulatory standards.

With the NRA now approving these plans, both companies said they now plan to apply for pre-operation inspections of those units. These inspections are to confirm that the safety countermeasure equipment complies with the approved construction plan at the plant.

Kyushu said it also plans to submit a construction plan for unit 4 at the Genkai plant. Of Japan's 42 operable reactors, five have so far cleared inspections confirming they meet the new

regulatory safety standards and have resumed operation. These are: Kyushu's Sendai units 1 and 2; Shikoku's Ikata unit 3; and, Kansai's Takahama units 3 and 4. Another 19 reactors have applied to restart.

Source: World Nuclear News, 25 August 2017.

USA

Call for Government to Revitalise US Nuclear Industry

Of Japan's 42 operable reactors, five have so far cleared inspections confirming they meet the new regulatory safety standards and have resumed operation. These are: Kyushu's Sendai units 1 and 2; Shikoku's Ikata unit 3; and, Kansai's Takahama units 3 and 4. Another 19 reactors have applied to restart.

The US government should hold "a structured conversation" with the country's nuclear industry on ways to restore and develop the sector, according to an essay from Mark Hibbs, senior fellow of the Carnegie Endowment for International Peace's nuclear policy program.

"The pending bankruptcy of Westinghouse, announced five months ago, could have far-reaching strategic impact on US exports and on the economic viability, safety, and security of nuclear power installations in the US and beyond," Hibbs says.... "There are four basic reasons why nuclear power plant exporters and their governments in the US and other western countries

The polarised political culture in Washington will prevent other, constructive partial solutions, such as the imposition of a carbon tax that would make nuclear power more cost competitive with other sources of energy.

should be keenly concerned about China's and Russia's understandably ambitious forays into future nuclear power plant markets," according to Hibbs.

Firstly, he notes that both Chinese and Russian companies planning to build reactors abroad are state-owned enterprises (SOEs), which puts them at a competitive advantage. "The US nuclear industry is a strategic industry, but Westinghouse and GE are privately owned companies, not SOEs," he says. However, he suggests a federal government bailout of Westinghouse is "neither likely nor desirable". He suggests, "The polarised political culture in Washington will prevent other, constructive partial solutions, such as the imposition of a carbon tax that would make nuclear

power more cost competitive with other sources of energy.”

... During the last 20 years, while China and Russia built dozens of reactors at home over, leading Western vendors virtually stopped constructing new units. “Western firms’ long-term loss of domestic expertise and political support will negatively ripple across their entire supply chain, and both the economics and the safety of installations operating in these countries may in coming years be threatened,” Hibbs suggests.

USA could lose its leadership in international nuclear governance “in the face of a future shift towards newcomers and away from established nuclear technology-owning countries”. Western nuclear power companies want their Chinese and Russian competitors to “engage fairly.

He also warns the USA could lose its leadership in international nuclear governance “in the face of a future shift towards newcomers and away from established nuclear technology-owning countries”. Western nuclear power companies want their Chinese and Russian competitors to “engage fairly”, Hibbs says. However, they do not want “to sacrifice the real benefits that come from partnering with Chinese and Russian industry, led off by market access and opportunities to take advantage of non-Western firms’ genuinely lower factor costs”.

The Trump administration, he says, should discuss with the US nuclear industry what steps the government should take to “enhance US nuclear exports and encourage a level international playing field for exporting nuclear equipment, material, and technology, especially to risk-bearing destinations”. “This might lead the White House to make better use of the US Export-Import Bank and to establish bureaucratic lines of authority to favour a more coordinated and strategic view in the federal government about nuclear trade.” ...

Source: World Nuclear News, 15 August 2017.

Vogtle Owner Asks DOE for \$1.6B More to Finish Project

Oglethorpe Power Corp., the second-largest partner in Georgia Power’s nuclear expansion project, has asked the Department of Energy for as much as \$1.6 billion in additional support to help finish the reactors....

The money will help cushion the blow of an increased budget used to pay for two reactors at Plant Vogtle, already years behind schedule and billions above their original forecast amount. Oglethorpe, a 30 percent

owner in the project, already has a \$3 billion loan guarantee from the Energy Department.

It has drawn on \$1.7 billion of that amount. Oglethorpe, which serves 38 member cooperatives, is one of the public power companies involved in building the reactors at Vogtle in southeast Georgia. Its request to the Energy Department is one of several last-minute

moves the utility owners are making in efforts to lower the project’s overall price tag, which could top \$20 billion, based on estimates from two of the utility owners.

...Vogtle’s future has been in flux since its main contractor, Westinghouse Electric Co. LLC, filed for Chapter 11 bankruptcy protection in March.

Westinghouse’s bankruptcy stemmed from significant cost increases at Vogtle and a nuclear project in South Carolina.

The electric companies in Georgia and South Carolina analyzed how much it would cost to finish their reactors. In South Carolina, Scana Corp.’s South Carolina Electric & Gas Co. and state-owned Santee Cooper decided that the amount would be too much for their customers

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to bear and have abandoned their project. South Carolina's governor, Legislature and utility regulators have sharply criticized the utilities for their decision, accusing them of charging their customers billions for reactors that won't produce electricity.

...Vogtle, regulators, analysts and other stakeholders are waiting for Georgia Power to reveal its highly anticipated final analysis of how much it would take to finish the reactors, as well as to cancel them. A public version of that report is due out next week. Georgia Power has a 45.7 percent share of Vogtle, but its report will contain input from the other co-owners.

... Oglethorpe, the Municipal Electric Authority of Georgia and Dalton Utilities have their own boards or set of independent decisionmakers, but none has revealed whether they have decided to go forward with the project. Oglethorpe will need to increase its original \$5 billion budget to a range of \$6.5 billion to \$7.3 billion, including a contingency amount, according to a Securities and Exchange Commission filing. This amount covers a combination of construction and financing costs.

Southern Co., Georgia Power's parent, has given a range of \$6.7 billion to \$7.4 billion in capital costs alone. Oglethorpe's and Southern's figures are offset by billions that Westinghouse's parent, Toshiba Corp., has agreed to pay to underwrite Vogtle. Without that infusion, Georgia Power's capital costs for Vogtle will increase to \$8.4 billion to \$9.1 billion.

...DOE has already agreed to back \$8.3 billion in loans to Vogtle. Georgia Power is also working with the agency to increase the amount of federal support.... The utilities negotiated a new working

arrangement with Westinghouse that includes making Southern's nuclear unit and Georgia Power the main contractors at Vogtle. DOE approved the new agreement in July 2017 and amended the loan terms along with it, "given the Westinghouse bankruptcy and the disruption on the project," Higgins said.

This includes suspending any advances to the utilities until they have finished their cost assessments and decided whether to finish Vogtle. As with the other utilities, Oglethorpe's executives were careful not to reveal where they stand on the project. Smith praised Southern Nuclear's experience in operating nuclear reactors. He also said that Oglethorpe is planning conservatively around the higher end of its economic forecast given that there's no longer

a fixed-price contract. ...The boards for Southern and Georgia Power also must sign off on the project at some point. A Westinghouse company email obtained by E&E News said that Southern Nuclear's board did not announce a decision on Vogtle's reactors

Source: <https://www.eenews.net/>, 26 August 2017.

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Russia will take part in the construction of at least two out of six reactors, according to Andrey Lebedev, the vice-president of the company. China's Tianwan nuclear power plant was built in 2006 by Russia's nuclear power equipment and service export monopoly owned by Gazprom. It is the biggest joint NPP project between countries.

NUCLEAR COOPERATION

RUSSIA-CHINA

Rosatom to Build Nuclear Power Plant in China

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Two of its units with a capacity of 1,000 MW each were opened in 2007, while the construction of

the third and the fourth units is still underway. The countries are reportedly negotiating the possibility of adding seventh and eighth units. Last year in 2016, Beijing and Moscow said they intended further strategic partnerships in the peaceful use of nuclear energy. "The fact China offered Russia to build new nuclear power plants shows that plans for extending cooperation in the sector are moving to practical implementation," said Aleksandr Uvarov, the chief editor of the AtomInfo web portal, as quoted by RIA.

Source: <https://www.rt.com/>, 17 August 2017.

NUCLEAR PROLIFERATION

IRAN

Iranian President Threatens to Restart Nuclear Program

Iran's President issued a direct threat to the West ... claiming his country is capable of restarting its nuclear program within hours and quickly bringing it to even more advanced levels than in 2015, when Iran signed the nuclear deal with world powers. Rouhani's comments are seen as a direct response to the new US legislation earlier in August that imposed mandatory penalties on people involved in Iran's ballistic missile program and anyone who does business with them. The US legislation also applies terrorism sanctions to the Revolutionary Guard and enforces an existing arms embargo.

.... Rouhani's remarks were likely an attempt to appease hard-liners at home who have demanded a tougher stand against the US. But they are also expected to ratchet up tensions further with the Trump administration. Iran has said the new US sanctions amount to a "hostile" breach of the 2015 nuclear deal.... But Rouhani also tempered his own threat, adding that Iran seeks to remain loyal to its commitments under the nuclear deal, which opened a "path of cooperation and confidence-

building" with the world. "The deal was a model of the victory of peace and diplomacy over war and unilateralism," said Rouhani. "It was Iran's preference, but it was not and will not remain Iran's only option."

Source: *The Hindu*, 27 August 2017.

NORTH KOREA

Nuclear Blast Imminent, Warn Security Services

A missile has not been launched at the Punggye-ri Nuclear Test Site since September 2016. But spy bosses have warned a test could be just days away - suggesting a nuclear blast is imminent. South Korea's National Intelligence Service (NIS) monitors the test site by satellite on a daily basis. And because the bombs are tested underground beneath Mount Mantap, signs of excavation are closely watched for.

Rouhani's comments are seen as a direct response to the new US legislation earlier in August that imposed mandatory penalties on people involved in Iran's ballistic missile program and anyone who does business with them. The US legislation also applies terrorism sanctions to the Revolutionary Guard and enforces an existing arms embargo.

Experts believe preparations for two test tunnels have been completed so far - and NIS chief Suh Hoon warned a blast could fall on September 9. The date is a national holiday in North Korea, the Day of the Foundation of the Republic, and the same date when Kim last conducted a

nuclear test.

South Korea-based reporter Christine Kim said the North wanted to make its nuclear warheads smaller so they could be mounted on a missile. She added: "Experts believe North Korea has secured some technology to make its warheads small but it's not quite there yet so more testing is needed. "In order for missiles to fly a long distance, anything attached... would have to be lightweight to ensure the missiles fly for longer and farther."

It was feared a nuclear test under the mountain could see North Korea destroy itself by sparking a huge volcanic eruption. But 38 North, a think tank dedicated to monitoring North Korea's

activities, suggested this phenomenon is unlikely.

Source: <http://www.express.co.uk>, 28 August 2017.

SOUTH KOREA

South Koreans Want Their Own Nuclear Weapons but Doing So Risks Triggering

North Korea has nuclear weapons — and a majority of South Koreans support getting them too, but the consequences of doing so could be far reaching. The US battlefield nuclear weapons in South Korea were removed in 1991, but since then North Korea has conducted five nuclear tests and achieved alarming success in its ballistic missile program. Based on reports, the North has the capability to produce several dozen nuclear bombs.

"It's not really a good solution for a country like South Korea to remain non-nuclear when its neighbors are becoming nuclear and becoming quite aggressive," said Anders Corr, a former government analyst and principal at consulting firm Corr Analytics. Polling done by Gallup Korea has shown nearly 60 percent of South Koreans would support nuclear armament, according to Yonhap news agency. The largest support is found among residents age 60 and above.

Some suggest that the opinion surveys reflect the anxiety level of some South Korean residents about what the true aims are of North Korea's Kim Jong Un, an unpredictable and brutal leader known for taking risks...."Given the situation we're now facing a nuclear-armed North Korea, maybe it is time for the US to really take a look at this option," said In-Bum Chun, a retired lieutenant general in the Republic of Korea Army and now is a visiting scholar at the US-Korea Institute at Johns Hopkins School of Advanced International Studies.

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There's uneasiness from South Koreans watching their neighbor to the north develop nuclear weapons, but added that there's still not been a serious debate about the costs of acquiring nuclear weapons. if South Korea were to arm itself with nuclear weapons it would a violation of the country's international commitments, which means Seoul "would be very likely to have serious sanctions imposed on it.

...However, the retired South Korean military officer said that any discussion about Seoul getting its own nuclear weapons arsenal should first be done in Washington and should be started if it hasn't already. Also, he said the assumption must be that if the North Koreans were to get rid of their nuclear weapons, so would the South Koreans (if they had them)....

...If South Korea were to arm itself with nuclear weapons, China would likely protest and probably take the matter to the UN as a violation of the NPT,

of which South Korea is a signatory but not North Korea. Yet there also are concerns South Korea getting its own nukes could trigger a wider US-China war because if Seoul were to use the weapons against North Korea, the regime's longtime ally Beijing might respond with an attack of its own that might include targeting US military bases in South Korea or the Asia-Pacific region. "I think South Korea acquiring nuclear weapons is possible, but unlikely," said.

... James Acton, co-director of the nuclear policy program and a senior fellow at the Carnegie Endowment for International Peace said it's understandable there's uneasiness from South Koreans watching their neighbor to the north develop nuclear weapons, but added that there's still not been a serious debate about the costs of acquiring nuclear weapons. "If there was a very serious discussion of the costs, I think you would find much less support for nuclear weapons," he said. For instance, Acton said if were to arm itself with nuclear weapons it would a violation of the country's international commitments, which means Seoul "would be very likely to have serious sanctions imposed on it." Also, he said the US

might decide to no longer offer its own security commitments to South Korea.

... Back in the 1970s, South Korean President Park Chung-hee secretly began a nuclear weapons development program. Once the US learned about it, the US pressured Seoul to halt the program. As was the case then, it remains US policy to oppose the spread of nuclear explosives in the region.

At the same time, another option is the US could redeploy tactical nuclear weapons to South Korea. But doing so would violate the 1992 Seoul-Pyongyang joint agreement on denuclearization of the Korean Peninsula. Pyongyang violated its end of the agreement in 2006 when it exploded its first nuclear device under Kim Jong Il, father of the regime's current young leader. Also, bringing back tactical weapons to South Korea could make the US perhaps an even bigger target of North Korea and its communist neighbor, China. Pyongyang recently threatened to lob ballistic missiles toward US military bases on the Pacific territory of Guam, which hosts the Air Force's B-1B bombers and a Navy submarine base.

... That said, South Korea has "serious concerns about the reliability of those guarantees under President Donald Trump," Acton said. He said Trump has done "a lot to disrupt the US-South Korean relationship — and I think it's very important that the disruption stop." "Donald Trump's statements about allies needing to pay their fair share and his hesitation about whether the US would back up NATO's Article 5 commitment ... has all given people in South Korea greater anxiety about the American military commitment to help protect South Korea," said Daryl Kimball, executive director of the Arms Control Association, a Washington-

based research and advocacy group....

Source: Jeffrey Daniela, <https://www.cbc.com/>, 24 August 2017.

UKRAINE-NORTH KOREA

Ukraine Denies Supplying North Korea with Missile Technology, Alleges Russia to Blame

Bringing back tactical weapons to South Korea could make the US perhaps an even bigger target of North Korea and its communist neighbor, China. Pyongyang recently threatened to lob ballistic missiles toward US military bases on the Pacific territory of Guam, which hosts the Air Force's B-1B bombers and a Navy submarine base.

An anxious Kyiv has denied a story in *The New York Times* quoting an expert as saying North Korea may have obtained rocket engines from a Ukrainian state-run factory known as Yuzhmash, and instead alleges Russia is to blame. Citing a report by the IISS and classified assessments by US intelligence agencies,

the *Times* on 14 August 2017 reported that Pyongyang's recent progress in its long-range missile program may be due to it having obtained advanced engine technology from Ukraine or Russia.

But the secretary of Ukraine's National Security and Defense Council (NSDC), Oleksandr Turchynov, insisted that could not be the case. "Ukraine has never supplied rocket engines or any kind of missile technology to North Korea," he said in a strongly worded statement published on the council's website. "We believe that this anti-Ukrainian campaign was triggered by Russian secret services to cover their participation in the North Korean nuclear and missile programs."

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...Michael Elleman, the expert and author of the report for the London-based IISS, told *The New York Times* that he believed the Yuzhmash missile factory, located in the eastern Ukrainian city of Dnipro, was "the most likely source of the engines" that powered North Korea's two intercontinental ballistic missiles in July 2017.... However, Elleman

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conceded that the North Koreans could have gotten the technology from Russia's state-run rocket company, Energomash, as well, something he reiterated on Twitter following publication of the report and a wave of public scrutiny.

As the report notes, the Yuzhmash factory is located near territory controlled by Russia-backed separatists in eastern Ukraine. It is also not far from the border with Russia, and amid the chaos of war, Ukraine's east has become a haven for illicit trade. A Ukrainian security official who asked not to be named because of the sensitive nature of the issue said Ukraine had had success in tackling smuggling recently but had in the past struggled with keeping secrets from the rocket factory from leaking outside the country.

The Kyiv Post, citing local and international reports, said that North Korean spies had attempted to steal rocket technology from Ukraine in June 2012 and December 2015, in both cases from Yuzhmash. In 2015, the paper reported, Ukraine claimed to have detained and sentenced two North Korean diplomats from Belarus who had tried to photograph secret Yuzhmash documents relating to the construction of liquid-fuel rocket engines....

...The allegations of Ukraine's possible involvement in supplying Pyongyang with missile technology come at a particularly crucial moment for the country. US President Donald Trump's administration is currently weighing whether to provide Kyiv with lethal weapons, including Javelin antitank missiles, to better defend against the Russia-backed forces it has been fighting in its east for more than three years. Asked if the NSDC or any other security body would be investigating

whether the rocket technology could have been obtained illegally from someone in Ukraine and smuggled to Pyongyang, Lytvynenko said that "could not happen," suggesting there would be no inquiry....

Source: <http://www.globalsecurity.org/>, 14 August 2017.

North Korea Likely Can Make Missile Engines without Imports: US

The Yuzhmash factory is located near territory controlled by Russia-backed separatists in eastern Ukraine. It is also not far from the border with Russia, and amid the chaos of war, Ukraine's east has become a haven for illicit trade.

North Korea likely has the ability to produce its own missile engines and intelligence suggests it does not need to rely on imports, US intelligence officials said on 15 August 2017. The assessment disputes a new study by the

London-based IISS that said that the engines for a nuclear missile North Korea is developing to hit the US likely were made in factories in Ukraine or Russia and probably obtained via black market networks.

The New York Times report said that classified assessments by US intelligence agencies mirrored the IISS finding. "We have

North Korea likely has the ability to produce its own missile engines and intelligence suggests it does not need to rely on imports. The assessment disputes a new study by the London-based IISS that said that the engines for a nuclear missile North Korea is developing to hit the US likely were made in factories in Ukraine or Russia and probably obtained via black market networks.

intelligence to suggest that North Korea is not reliant on imports of engines," one US intelligence official told Reuters. "Instead, we judge they have the ability to produce the engines themselves."

The US officials did not disclose any details of what underpinned the assessment on the high-

performance liquid-fueled engines, called RD-250's. Ukraine denied that it had ever supplied defense technology to North Korea. The Ukrainian factory cited in *The New York Times*, state-owned Yuzhmash, said it had not produced military-grade ballistic missiles since independence from the Soviet Union in 1991.

Another US intelligence official said that the modifications to the RD-250 that resulted in improved reliability may have relied in part on foreign scientists recruited by North Korea or been developed by North Koreans educated in Russia or elsewhere. Ukraine is supported by the US in its fight against Russian-backed separatists in eastern Ukraine.

Asked about the reports that North Korea may have obtained Ukrainian-produced engines, State Department spokeswoman Heather Nauert praised Kiev's efforts to halt weapons proliferation. "Ukraine, though, we have to say has a very strong nonproliferation record and that includes specifically with respect to the DPRK," she said, using the acronym for North Korea's official name, the Democratic People's Republic of Korea.

...By comparing the engines in the photographs to others, it found that they likely were modified versions of the RD-250 produced by Yuzhmash and accounted for sudden successes in North Korean missile tests following a slew of failures. The IISS study is also being disputed by some leading independent nuclear weapons experts.... Lewis said his research team performed measurements independent from each other on the same photographs used in the IISS study and determined that they were of different sizes. They concluded that the motors for the North Korean ICBM likely were indigenously built. Lewis also pointed to a 17 January 2017, US Treasury announcement of US financial sanctions on Iranian firms for helping North Korea develop the engine that was tested in November and most closely resembles the Ukrainian engine.

Source: <https://www.reuters.com/>, 16 August 2017.

NUCLEAR SECURITY

CHINA

AEA Conducts First Nuclear Security Assessment of China

The IAEA started its first nuclear security

assessment of China, at the request of China Atomic Energy Authority (CAEA). During the 10-day assessment, the agency will review China's nuclear security system, laws and government supervision, and visit nuclear plants in Zhejiang Province, according to the CAEA. The IAEA will carry out reviews of nuclear security systems and make suggestions for improvement, said Wang Yiren, vice chairman of the CAEA.

China regards nuclear security as an important part of national security, state run Xinhua quoted the CAEA as saying. The CAEA is responsible for China's international nuclear cooperation, emergency response and management. As the central intergovernmental forum for scientific and technical cooperation in the nuclear field, the IAEA works to ensure safe, secure and peaceful use of nuclear science and technology. China currently has 23 nuclear power generating units in operation and 27 under construction, about one third of the world's unfinished nuclear units.

Source: <http://economictimes.indiatimes.com>, 28 August 2017.

NUCLEAR SAFETY

CHINA

China Says Nuclear Safety Law Ready to be Passed

A new nuclear safety law in China is ready to be passed, state media said, adding that the legislation will help prevent and deal with accidents and promote development of the industry. Safety in China's nuclear industry has become increasingly important as it seeks to increase exports of its nuclear technologies. China has already signed agreements to build reactors in Argentina, Romania, Egypt and Kenya.

It plans to build more than 60 nuclear plants at home in the coming decade and will see total domestic capacity rise to 58 gigawatts by the end of 2020. The new law is needed to better ensure nuclear safety, prevent and deal with nuclear

It plans to build more than 60 nuclear plants at home in the coming decade and will see total domestic capacity rise to 58 gigawatts by the end of 2020. The new law is needed to better ensure nuclear safety, prevent and deal with nuclear accidents, protect people's health and the environment and promote the industry's development.

accidents, protect people's health and the environment and promote the industry's development, the official Xinhua news agency said, citing parliament's standing committee.

The law is designed to oversee and manage risks associated with building nuclear facilities, taking them out of commission and how to deal with nuclear waste, the news agency added, without giving details. Lawmakers have suggested the time is right to approve the law, Xinhua said, meaning it is likely to pass when parliament ends its latest legislative session.

The IAEA released a report on China's nuclear safety last year saying China's nuclear safety record had been strong but needed "further work" in areas such as waste management and handling ageing plants. China's environment ministry said in February it had fined a manufacturer of components used in nuclear power plants for safety breaches at two facilities.

Source: The Indian Express, 28 August 2017.

IRAN-SWITZERLAND

Iran, Switzerland Discuss Nuclear Safety

Head of Iranian Center for Nuclear Safety System Hojjatollah Salehi and Director General of the Swiss Federal Nuclear Safety Inspectorate Hans Wanner followed up on the implementation of a memorandum of understanding signed last September 2016, IRNA reported. The agreement followed discussions between Iranian nuclear officials and Wanner during his visit to Tehran in March 2016, when he was accompanying then Swiss president, Johann Schneider-Ammann.

The two officials agreed that a team of Swiss nuclear safety experts visit Iran this fall to start collaborating with their Iranian counterparts. The agreement came in the wake of the landmark 2015 nuclear deal involving Iran and P5+1 (the US, Britain, France, China and Russia, plus Germany).

The deal, which came into force in January 2016, envisaged Tehran scaling back its nuclear program in return for the lifting of all nuclear-related sanctions. The deal urges cooperation on civil applications of nuclear energy between Iran and the international community.

Source: <https://financialtribune.com/>, 21 August 2017.

USA

Senator Seeks Answers on LANL's Nuclear Safety

A US senator has asked the National Nuclear Security Administration to report to Congress on the costs and safety of Los Alamos National Laboratory's weapons production program and, in particular, the potential for critical accidents.

In early August 2017, US Sen. Claire McCaskill, D-Mo., a ranking member of the Senate's Homeland Security and Governmental Affairs Committee, sent a letter to Frank Klotz,

administrator of the NNSA, saying she had serious concerns about poor federal oversight and management of the laboratory and requesting a report.

The inquiry was triggered by a series of investigative reports by the Washington, D.C.-based Center for Public Integrity, which were published in *The New Mexican* and other newspapers earlier this summer. The series highlighted a number of serious incidents at Los Alamos' plutonium facility, events that could have led to significant radiological releases and worker deaths. Poor management has resulted in unsafe working conditions, injured workers and federal violations at the plutonium facility and other sites, and senior officials rarely were penalized for the problems, the stories said.

The investigative series is among a number of critical looks at the lab's safety record in recent months. The Defense Nuclear Facilities Safety Board, an independent adviser to the US

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Department of Energy, raised questions at a hearing in Santa Fe in June 2017 about the lab's ability to handle increasing quantities of plutonium. The Energy Department also launched an investigation after plutonium from the lab was shipped out of state by air rather than cargo truck, violating federal regulations.

Los Alamos was the only nuclear site that failed its annual review for nuclear criticality safety in fiscal year 2016, a program designed to prevent severe nuclear accidents. The lab was graded as "adequate but needs improvement" the previous year, according to a federal report. In her 03 August 2017 letter to Klotz, McCaskill said, "Private firms contracted to operate and maintain these facilities have not been held accountable in a meaningful way for the safety lapses that occurred under their watch."

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The lab is currently operated by Los Alamos National Security LLC, a consortium that includes the University of California, Bechtel, BWXT Technical Services Group Inc. and AECOM, but new management will take over in 2018. LANS lost a chance to renew its lucrative contract after a series of safety issues in 2014, including the improper packaging of a waste drum at Los Alamos that ultimately burst and released radiation at the Waste Isolation Pilot Plant in Carlsbad, one of the most costly nuclear accidents on record. ...

She asked the National Nuclear Security Administration to report on the current state of operations and safety testing at Los Alamos' plutonium facility, known as PF-4, and whether safety standards have been met. She also asked the agency to provide costs associated with closing the facility, how much of the agency's budget for fiscal year 2018 will go to improving safety standards, and if any penalties will be imposed on the lab or its management contractors.

... In an email to *The New Mexican*, a spokeswoman for the agency's Los Alamos Field Office said the NNSA has received McCaskill's

letter and is working with Congress to answer questions. "Safety is paramount at the National Nuclear Security Administration," Toni Chiri said, "and we have uncompromising standards for our labs, plants and sites to perform work in a safe and secure manner."

Soon after the Center for Public Integrity published its series, Klotz released a statement saying the agency had been holding the lab accountable. It withheld \$82 million in award fees for Los Alamos operators between 2013 and 2016 as a result of safety incidents at the plutonium facility, he said.

...He also said the lab was on track to create new plutonium pits — the softball-size plutonium triggers within nuclear weapons. The lab is expected to create as many as 80 pits by 2040. Lab spokesman Kevin Roark said in email... "PF-4 is operational. It is operating consistent with its established safety requirements including required testing. Testing is conducted daily at PF-4 to establish the functional aspects of the facility to ensure the safety of the workers and the public."

Source: <http://www.santafenewmexican.com/>, 23 August 2017.

NUCLEAR WASTE MANAGEMENT

AUSTRALIA

Leonora Lobbies for Nuclear Waste Dump in its Backyard

Leonora in WA's northern Goldfields is putting together a bid for an outback repository to store radioactive waste. The Federal Government's decade-long search for a national radioactive waste management facility appears far from over. This has provided a window of opportunity for the Shire of Leonora to press its case again to host a national repository for waste arising from medical, industrial and scientific use.

Leonora looked to have missed its chance in November 2015 when it was left off a short-list of six sites, five of which have since been ruled

out by the government. On that occasion, the Shire put together a last-minute bid, nominating about 81 hectares of freehold land owned by Councillor Glenn Baker.

An application for an exploration license for a new site, north-west of Leonora, is currently being assessed by multiple State Government departments. Shire of Leonora president Peter Craig conceded there were no guarantees the new site would receive state approval. But he said the Council believed the waste dump was an opportunity worth pursuing.

Solving the problem of what to do with Australia's radioactive waste has been a growing headache since the 1950s. The government's search for a new site — likely to cost more than \$100 million — has intensified in recent years, with ANSTO's facility at Lucas Heights near Sydney running out of space.

...A spokeswoman for acting Resources Minister Barnaby Joyce said the government could continue to accept and assess any new nominations for sites until a final decision is made on the location of the facility.... It said Australia had 4,250 cubic metres of low-level waste stored at Lucas Heights and Woomera in outback South Australia. Low-level waste largely comprised paper, rags, tools, clothing and filters, which is often compacted or incinerated in a closed container before disposal.

There was also 656 cubic metres of much more hazardous, intermediate-level material, including spent nuclear fuel rods, luminous paints and industrial waste. The Department claims the amount of low and intermediate waste stored in Australia takes up the equivalent of two Olympic-sized swimming pools. It said the amount of low-level waste generated in Australia every year was less than 40 cubic metres, or smaller than one shipping container. By comparison, Britain and France each produced around 25,000 cubic metres

of low-level waste annually — about 600 times more than Australia.

Source: Jarrod Lucas, <http://www.abc.net.au/>, 18 August 2017.

JAPAN

METI Seeks to Pass Nuclear Buck with Release of Waste Disposal Map

Taro Kono's appointment as the new foreign minister is raising eyebrows. Though he hasn't shown any indication that he will buck Prime

Minister Shinzo Abe's agenda, Kono is considered a leftish maverick within the Liberal Democratic Party, especially with regard to its nuclear energy policy, which he has opposed. In an editorial, the conservative Sankei Shimbun insisted he

maintain the LDP line when the 30-year US-Japan nuclear energy pact expires next year.

The pact's ostensible purpose is to authorize the reprocessing of spent nuclear fuel for energy purposes so as to limit the amount of weapons-

grade plutonium Japan can stockpile. This system has been stymied, however, by the decommissioning of the experimental Monju fast-breeder reactor and the shutdown of most of the nation's nuclear plants following the Fukushima No. 1 meltdowns in 2011.

Whatever reprocessing of spent fuel that has been done has been carried out in the UK and France and, of the 47 tons of extracted plutonium possessed by Japan, 36 tons are still overseas.

So the US has no reason to worry about the prospect of Japan suddenly turning plutonium into bombs. Japan's "peaceful" use of atomic energy, after all, was encouraged by America in the 1950s, when the horrors of Hiroshima and Nagasaki were still fresh in people's minds.

But Japan's long-term plan of recycling spent fuel

Solving the problem of what to do with Australia's radioactive waste has been a growing headache since the 1950s. The government's search for a new site — likely to cost more than \$100 million — has intensified in recent years, with ANSTO's facility at Lucas Heights near Sydney running out of space.

But Japan's long-term plan of recycling spent fuel into plutonium fuel has hit a wall, not only because of Monju's failure, but also because of the continued postponement of the opening of the reprocessing plant in Rokkasho, Aomori Prefecture.

into plutonium fuel has hit a wall, not only because of Monju's failure, but also because of the continued postponement of the opening of the reprocessing plant in Rokkasho, Aomori Prefecture.

Nevertheless, two weeks ago, the Ministry of Economy, Trade and Industry (METI) published a map showing plans for disposing of the high-level waste that's a byproduct of processing. The map illustrates possible candidate areas for waste disposal. "Suitability" is indicated by color, with green being the most suitable and orange unsuitable due to geological phenomena such as earthquake faults, volcanoes and ground water movement. The green areas are mainly on the coastline because ships will likely be used to transport the waste. Silver is used for areas not being considered because they may contain deposits of minerals that can still be exploited.

The map was drawn up so that the public would know the government still takes its nuclear energy program, as well as the stalled recycling plan, seriously, and most media outlets have conveyed those points. However, NHK has looked at the map and wondered if it has any real meaning. As the public broadcaster pointed out on its "Jiron Koron" explanation series, the waste will be kept underground for up to 100,000 years, buried 300 meters deep at the bottom of a series of deep tunnels.

Consequently, getting local governments to offer land for disposal sites is going to be very difficult. METI insists that participation is voluntary and has sent requests to 1,750 municipalities, but given the public's allergy to nuclear power in the wake of Fukushima, NHK doesn't seem to think anyone is going to raise their hand, even though acceptance comes with rewards: ¥2 billion for the

initial two-year data study and ¥7 billion for the followup on-site study. After accepting those two deliveries of cash, a local government could still reject METI's request. And even if it grants METI's request, landowners will later have to be consulted and paid. At present the cost of disposal is estimated at ¥3.7 trillion, but it is sure to go up.

The plan is actually an old one, developed as part of the scheme to recycle spent fuel, a process that produces its own particular waste that is much more radioactive than the spent fuel itself. This waste is combined with molten glass and poured into steel canisters, which are eventually buried underground. According to international law, such waste is the responsibility of the country that owns the original fuel and cannot be exported for disposal. Because of the delay with

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Rokkasho, Japan has had the UK and France do their recycling, and the waste has been shipped back to Japan along with the recycled fuel. It's now sitting at the Rokkasho plant in refrigerated containers.

There is also a lot of spent fuel at Rokkasho waiting to be reprocessed, and the governor of Aomori, frustrated by the government's equivocation, has been threatening to send it back to the reactors from whence it came if the plant isn't opened for business. There are presently 18,000 tons of spent fuel in storage at the plants that produced it and there is no room left for any more.

The disposal plan is only theoretical as long as Rokkasho remains inoperable and fuel reprocessing delayed. Moreover, there has been no public discussion about what happens to all the spent fuel if reprocessing is abandoned, though there are media reports of a "feasibility study." ...

Source: The Japan Times, 21 August 2017.

UK

Low Level Radioactive Waste Deal for Amec Foster Wheeler

Amec Foster Wheeler has secured two framework contracts from the company that manages the UK's lower level radioactive waste. As part of the ESC framework, Amec Foster Wheeler explained that it has been appointed as the single supplier for hydrogeological and geological support, and as one of four suppliers for general technical support. It is estimated that the contract will generate approximately £2 million in revenue over the next four years.

The WCASS framework, which is expected to be worth about £2 million over four years, will see Amec Foster Wheeler providing analytical support services and environmental monitoring support from its full-service analytical laboratories. "These wins advance Amec Foster Wheeler's strategy to expand our share of work on radiological and waste management programmes in Europe," said Andy White, Vice President for Decommissioning at Amec Foster Wheeler's Clean Energy business.

Source: <https://waste-management-world.com/>, 27 August 2017.



Centre for Air Power Studies

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Centre for Air Power Studies

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