



NUCLEAR SECURITY



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

Vol 13, No. 7, 01 Feb 2019

OPINION – Bhopinder Singh

Hype and Scepticism Prevails over China's New 'Mother of All Bombs'

All global conflicts since the Second World War have necessitated the exclusive deployment of "conventional" weapons. The psychology of sovereign power fuels the quest for developing the "big-bigger-biggest" phenomenon in weapons among the most powerful militaries in the world. Even though the operational nuclear weapons and technology have been around since the 1940s, the global non-proliferation treaties and non-use commitments have ensured that the parallel development of "conventional" weaponry that still skirts the various provisions, deterrence and protocols on nuclear weapons usage, continues unabated.

While China and India have pledged a NFU stand on nuclear weapons, the more belligerent states like Pakistan, Israel and North Korea have declined to commit to a "NFU" stand, as a means to posture aggressive-deterrence against perceived enemies. The US, Russia and NATO retain a "pre-emptive first strike" stance, with various caveats to justify their "defensive intent", and so far the first and last time such weapons were used were the "Little Boy" and "Fat Man", by the US in August 1945 against Japan in Hiroshima and Nagasaki respectively.

Even though the operational nuclear weapons and technology have been around since the 1940s, the global non-proliferation treaties and non-use commitments have ensured that the parallel development of "conventional" weaponry that still skirts the various provisions, deterrence and protocols on nuclear weapons usage, continues unabated.

CONTENTS

- ☞ OPINION
- ☞ NUCLEAR STRATEGY
- ☞ BALLISTIC MISSILE DEFENCE
- ☞ NUCLEAR ENERGY
- ☞ NUCLEAR COOPERATION
- ☞ URANIUM PRODUCTION
- ☞ NUCLEAR PROLIFERATION
- ☞ NUCLEAR DISARMAMENT
- ☞ NUCLEAR WASTE MANAGEMENT

All global conflicts since the Second World War have necessitated the exclusive deployment of "conventional" weapons. The obvious race to develop the most powerful non-nuclear-bomb had led to the famous "Daisy Cutter", or the BLU-82, in the US. This 6.8-ton high-intensity monstrosity was extensively airdropped in the conflict zones of Vietnam, the Gulf War and Afghanistan to intimate with "shock-and-awe" tactics, flatten artillery emplacements or clear helicopter landing points in enemy territory. Britain's Special Air Service (SAS) unit in the Gulf War had mistakenly reported back to its headquarters that the US had "nuked Kuwait", after seeing the impact of these BLU-82s! Later, these BLU-82s were replaced by the

GBU-43/B Massive Ordnance Air Blast (or MOAB, which earned a more popular moniker “Mother of all Bombs”). This 10-ton extreme weapon of intimidation was first used in combat on an ISIS-Khorasan cave complex in the impregnable Nangarhar province of Afghanistan and led to the killing of 94 ISIS-Khorasan militants.

Not to be outdone, the US’ Cold War rival Russia field-tested its “Aviation Thermobaric Bomb of Increased Power” (ATBIP), or the “Father of all Bombs” (FOAB), in 2007, a thermobaric weapon of

smaller physical dimension, but with supposedly deadlier impact — 44 tons of TNT or four times more damaging than the US “MOAB”! Given its destructive capabilities which match those of a smaller/tactical nuclear weapon, without a subsequent radioactive fallout outside of its blast radius — the race to develop the most powerful non-nuclear-bomb has escalated.

Recently, the Chinese have joined the club with their own version of the “Mother of all Bombs” — believed to be approximately 6m long and weighing several tons, only one was able to be airlifted and dropped by the H6-K Chinese bomber aircraft. Like the Russian version, the Chinese claims of its destructive abilities cannot be technically verified. The relatively smaller size and lighter weight of the Chinese MOAB gives it the ostensible option to be carried in a bomber aircraft, unlike the American MOAB that requires a transport aircraft to operate the same, given its gargantuan weight and size. The Chinese state-owned conglomerate and arms manufacturer, NORINCO, is behind the Chinese MOAB.

However, unlike the range, speed, accuracy and “undetected” homing abilities of a missile system — the delivery of these mega bombs are obviously less stealthy and typically usable in situations where the enemy has inadequate air defence systems on the ground or air to counter

the dropping of these bombs, such as the dropping in Afghanistan against the ISIS-Khorasan elements. Military analysts are also a lot less enthusiastic about the long-term impact and efficacy of the much-hyped US MOAB strike in Afghanistan, as ISIS

militants still dominate that particular area. It is argued that instead of achieving any strategic or even tactical military objective, it perhaps earned US President Trump the political bragging-rights of muscularity.

Therefore, while it is yet another feather in the cap of the Chinese arms manufacturing industry, it poses no immediate headache to India’s security calculus, given the air defence and related security systems. However, riding on the back of the recent

Chinese belligerence on threatening to blow up American naval ships and taking over Taiwan by force — the latest showcase of Chinese advancement in weaponry via the MOAB, is as much about political posturing as military muscle-flexing.

Besides China’s burgeoning nuclear programme with an estimated arsenal of 260 warheads, it is the recent advancements made in the

development of the fifth generation stealth fighter plane “J-20”, aircraft carrier and nuclear submarine building capabilities, Type-55 naval cruisers and the claimed “world’s best anti-ship missile” in CM-

Like the Russian version, the Chinese claims of its destructive abilities cannot be technically verified. The relatively smaller size and lighter weight of the Chinese MOAB gives it the ostensible option to be carried in a bomber aircraft, unlike the American MOAB that requires a transport aircraft to operate the same, given its gargantuan weight and size.

While it is yet another feather in the cap of the Chinese arms manufacturing industry, it poses no immediate headache to India’s security calculus, given the air defence and related security systems. However, riding on the back of the recent Chinese belligerence on threatening to blow up American naval ships and taking over Taiwan by force — the latest showcase of Chinese advancement in weaponry via the MOAB, is as much about political posturing as military muscle-flexing.

302 (Pakistan's Navy is said to be acquiring the same), that is threatening to alter the regional balance of power. With a Chinese defence budget said to be nearly four times that of India (\$175 billion to \$45 billion) and galloping away with a eight per cent increase over the previous year, China is "globalising" and modernising, both its armed forces and its manufacturing capabilities. The Chinese are pushing the boundaries of technological advancement by weaponising "artificial intelligence", which will require a completely separate realm and dedicated counter-measure to negate.

Holding all the investments and commitments towards acquiring "superpower" military capabilities, is the Chinese economic juggernaut that has slowly started developing cracks and has witnessed an unprecedented slowdown. The ongoing trade war with the US will put additional burden on the struggling Chinese economy and its ability of maintain the momentum in military preparedness. The Chinese benchmark stock index was among the worst performing in 2018, signalling the red-flag for its economic health that could jeopardise the hegemonic instinct and onward march towards fructifying the so-called "Chinese century". Sabre-rattling and posturing with weapons like the recent MOAB or snarling in the South China Seas or at Taiwan and Japan is one thing, actualising the "bite" and momentum is another thing. China's military and technology remains essentially untested on the battleground, and like its MOAB, enjoys and suffers from an equal measure of both hype and scepticism.

Source: <http://www.asianage.com>, 14 January 2019.

OPINION – Rebecca Davis Gibbons

Can this New Approach to Nuclear Disarmament Work?

An estimated 14,485 nuclear weapons exist on earth today — most are far more powerful than those that twisted railway ties, levelled buildings, and crushed, poisoned, and burned human beings in Hiroshima and Nagasaki. The majority of these weapons belong to the US and Russia. For some in the U.S. government...this number represents significant disarmament progress since Cold War highs of over 70,000 nuclear

Sabre-rattling and posturing with weapons like the recent MOAB or snarling in the South China Seas or at Taiwan and Japan is one thing, actualising the "bite" and momentum is another thing. China's military and technology remains essentially untested on the battleground, and like its MOAB, enjoys and suffers from an equal measure of both hype and scepticism.

weapons. They argue the current security environment means that further reductions are not possible at this time. In contrast, for many disarmament advocates and officials from non-nuclear weapons states, this number is still far too high. They are now clamouring to ban all nuclear weapons. Because of this divide, according to Ford, we currently face a "disarmament crisis."

To address this crisis, Ford recently announced a new approach to nuclear disarmament. Rejecting the traditional step-by-step reductions that U.S. officials and allies have long promoted, and even more strongly rejecting the path offered by the

The State Department plans to convene a set of multilateral working groups with 20 to 30 countries each to "identify aspects of the real world security environment that present major obstacles to further disarmament movement and to develop specific proposals for how those obstacles might be overcome."

2017 Nuclear Ban Treaty (which he called "emptily divisive virtue-signalling"), Ford revealed the establishment of the "Creating the Conditions Working Group." The State Department plans to convene a set of multilateral working groups with 20 to 30 countries each

to "identify aspects of the real world security environment that present major obstacles to further disarmament movement and to develop specific proposals for how those obstacles might

be overcome.”

The US presented a working paper at the spring 2018 NPT meeting with many of these “obstacles” or conditions listed. Ford argues this new path is necessary because current geopolitical tensions are not conducive to disarmament progress, and previous reductions leave little room for going lower while Washington and its allies continue to rely on America’s nuclear deterrent. There are at least three ways to view this new U.S. effort: First, a cynic may argue the State Department is seeking to make a show of pursuing nuclear disarmament even if it assumes there is little possibility of additional nuclear reductions any time soon. A new U.S. initiative on disarmament may provide a fig leaf, as at least some states will just be happy Washington is talking about disarmament at all. From the cynical perspective, little of substance will come from the effort, but making the effort is all that matters.

Second, a slightly less cynical observer might claim the U.S. government seeks to make real progress on some of these conditions but realizes that they are so difficult that progress is unlikely. Participants in the working groups from around the world will come to more fully appreciate the immense challenge of these problems. Thus, the U.S. argument that the conditions are not right for further nuclear disarmament will gain credence and disarmament pressure will lessen from key NPT stakeholders. Third, a generous observer might believe that the State Department believes real progress can be made on some of the conditions using a multilateral working group format. Of course, an “America First” administration that criticizes its allies and scorns many international institutions is probably not in the best place to lead this effort — one can imagine the approach would have been more effective after President Obama declared his vision of a world without nuclear weapons in 2009

The U.S. argument that the conditions are not right for further nuclear disarmament will gain credence and disarmament pressure will lessen from key NPT stakeholders. Third, a generous observer might believe that the State Department believes real progress can be made on some of the conditions using a multilateral working group format.

— however; it is worth considering this approach seriously. Are the conditions for disarmament listed in the 2018 working paper likely to be advanced using the working group model? The U.S. working paper presents approximately 15 conditions:

1. North Korea abandons nuclear weapons and the production of fissile material
2. Iran complies with non-proliferation requirements
3. All states respect the sovereignty and territorial integrity of all other states
4. Address regional tensions and conflicts
5. States renounce terrorism as an instrument of foreign policy
6. All states recognize Israel’s right to exist
7. A Middle East weapons of mass destruction-free zone is established
8. All states fully comply with IAEA safeguards, including the Model Additional Protocol
9. A global moratorium on the production of fissile material is established
10. Nuclear-armed states halt the increase in current nuclear arsenals
11. Nuclear-armed states improve transparency surrounding nuclear weapons doctrines and arsenals
12. States accept verification protocols and produce technology necessary for verification at very low numbers of nuclear weapons
13. All states comply with existing and future arms control and non-proliferation obligations
14. States establish the means of enforcing compliance with agreements
15. All of the above is accomplished while

ensuring the peaceful use of nuclear technology

It is notable how many topics on the list appear to be aimed at North Korea (#1, #4), Iran (#4, #5, #6, #7-in part, #12), and Russia (#3, #10, #13). This is not to say these steps are not helpful for future disarmament, only that it is a list of U.S. aims that may not be inclusive of what other countries would prioritize. Moreover, in reading this long and challenging list, it is difficult not to see it as being meant to delay talk of nuclear reductions. But, giving the initiative the benefit of the doubt, it merits considering which of the conditions are best suited to a multilateral working group approach.

To begin, some of these topics should or could be addressed in other existing groups. Halting the increase of current arsenals (#10) and improving transparency (#11) could be undertaken in existing bilateral arms control arrangements and by meetings of the NPT's five nuclear weapons states...with the eventual inclusion of India, Pakistan, and a less opaque Israel. Ensuring the peaceful use of nuclear technology (#15) could be addressed within the NPT or the NSG, the 48-country group that sets rules about global nuclear supply. Developing Middle East weapons of mass destruction-free zone (#7) has been a goal enshrined in many past NPT meetings. It is probably best tackled in a regional forum with additional stakeholders and will no doubt also have to address Israel's right to exist (#6).

To date, the stakeholders have been unable to convene an official meeting on this topic, so it is unclear how a U.S.-led working group would be able to bring the relevant states (i.e., Iran, Israel, Egypt) to engage face to face on this issue. The development of verification technology and protocols (#12) is perhaps best covered within the group for which this new initiative takes inspiration, the International Partnership for Nuclear Disarmament Verification. Established

during the Obama administration, the partnership brings a group of states together to consider the technical challenges of nuclear disarmament verification.

It would be unwise to address some of the other topics in the proposed multilateral working group structure. As verified by the IAEA on multiple occasions, Iran is in compliance with its non-proliferation commitments (#2), and the Iran nuclear deal, formally known as the Joint Comprehensive Plan of Action, was one means by which to ensure this. With the U.S. withdrawal from the Iran deal, it seems unlikely that Iran would participate in a working group on this topic, nor would others in the international community welcome U.S. leadership. The highest levels of the U.S. administration are

focused on the North Korean nuclear weapons program (#1), so it is hard to imagine what a multilateral working group would add, unless it means a reconvening of the six-party talks, which none of the key players wish to do. All states should renounce terrorism as a means of foreign policy (#5).

Unfortunately, this working group is likely to run into the same problem that has befuddled the United Nation's work on terrorism: the inability of its members to agree on a definition. The moratorium on producing fissile material (#9) — the key ingredients to nuclear weapons — is also a good idea and many nations have supported the establishment of a fissile material cut-off treaty. A working group is unnecessary to achieve support from most states, but it could convene to figure out next steps for negotiating the treaty outside of the Conference on Disarmament. At the Conference, the effort is stymied by the consensus-based rules where one state can stop the progress of negotiations. A working group is unnecessary to solve this problem, however. High level prioritization by a significant number of governments to move

To date, the stakeholders have been unable to convene an official meeting on this topic, so it is unclear how a U.S.-led working group would be able to bring the relevant states (i.e., Iran, Israel, Egypt) to engage face to face on this issue. The development of verification technology and protocols is perhaps best covered within the group for which this new initiative takes inspiration.

negotiations to a new forum is what is needed.

Culling the list of those topics discussed above, five remain that could make for beneficial working groups:

- All states respect the sovereignty and territorial integrity of all other states (#3)
- Address regional tensions and conflicts (#4)
- All states fully comply with IAEA safeguards, including the Model Additional Protocol (#8)
- All states comply with existing and future arms control and non-proliferation obligations (#13)
- States establish the means of enforcing compliance with agreements (#14)

Addressing regional tensions and conflicts (#4), is a preposterous task for this working group model. Embedded in this "condition" is a new list of seemingly intractable challenges to include mitigating the significant tensions in the Middle East, South Asia, Southeast Asia (including the South China Sea), and Northeast Asia. In general, convening groups to address any of these areas could be useful if the major players in the conflict were willing to participate, but that is a significant "if." Convening a working group of stakeholders connected to the South China Sea, for example, could be useful if China would attend. Otherwise the group risks antagonizing China and will do less to solve the conflicts than inflame them. A refusal to sit face-to-face in a regional forum has been a persistent stumbling block in the Middle East.

A group convened on safeguards (#8) would have to examine what it would take to make the Model Additional Protocol the universal safeguards standard. This safeguards agreement was developed in the 1990s after Iraq's secret nuclear

weapons program was revealed. International inspectors had been unable to detect the program in the 1980s, though Iraq was under safeguards, so the international community worked to create a more intrusive safeguards regime. The IAEA and state partners have been successful in promoting the universalization of the 1997 Model Additional Protocol, but key holdouts remain, including Brazil, Argentina, Egypt, Venezuela, and Syria. These states cite a number of political reasons for not concluding the stronger safeguards agreement, such as a lack of disarmament progress by the nuclear weapons states or Israel's status as a non-NPT member, though there are likely security reasons as well. The working group risks isolating these states, but perhaps they should feel isolated for their position outside of the mainstream on safeguards.

The IAEA and state partners have been successful in promoting the universalization of the 1997 Model Additional Protocol, but key holdouts remain, including Brazil, Argentina, Egypt, Venezuela, and Syria. These states cite a number of political reasons for not concluding the stronger safeguards agreement, such as a lack of disarmament progress by the nuclear weapons states or Israel's status as a non-NPT member, though there are likely security reasons as well.

The final three topics (#3, #4, and #14) can be considered together as they all involve the trillion-dollar question of how to encourage states to abide by international norms and agreements — and what to

do to enforce rules when they do not. With Syria and Russia's use of chemical weapons in violation of the Chemical Weapons Convention, Russia's violation of Ukraine's sovereignty and violation of the INF Treaty, and the U.S. administration's undermining of international laws of asylum, the international community desperately needs a renewed discussion of how to address the problem of enforcement with international rules. Norms are powerful, but they are not enough. This working group topic is ripe for creative ideas. In the interwar period in the 1930s, for example, some argued that limiting the supply of a specific group of minerals to aggressor states would curtail their war-making capabilities. Scholars argued this "mineral sanction" could have helped prevent the world wars.

While that solution may not be feasible today, the group could consider how a new global consensus about rules and norms could be achieved and what new enforcement mechanisms could work to help existing and future regimes with compliance and enforcement. Finally, I offer an alternate working group topic: how to sustain the NPT for the next 50 years. 2020 is the 50-year anniversary of the entry into force of the treaty — the cornerstone of global nuclear non-proliferation efforts. In its first 50 years, these efforts were developed, supported, and maintained in large part by the global superpowers. In a time of geopolitical change and uncertainty, it is time to consider how nuclear order will be sustained for the next half century. Which powers will sustain nuclear order if this is no longer a priority of the US? How can the NPT endure given the divide between nuclear weapons state and non-nuclear weapons states over nuclear disarmament?

Is it reasonable to expect the treaty to last another five decades without the inclusion of India, Pakistan, and Israel? What adaptations should be made? These are difficult questions that few governments are currently considering. The longevity of the NPT has long been taken for granted in Washington and elsewhere. This can no longer be assumed, and whether via the conditions-based approach or other means, it is critically important that the United States devote considerable time and diplomatic capital to ensuring the treaty — and the benefits it provides to national, allied, and international security — endures.

Source: <https://warontherocks.com>, 23 January 2019.

OPINION – James J. Cameron

How the Trump Administration is Changing U.S. Missile Defense

President Trump laid out his new missile defense program on Jan. 17, which he said “will shield every city” and “invest in a space-based missile defense layer.” President Trump revealed the U.S. Missile Defense Review (MDR), a congressionally mandated statement of U.S. policy to defend the US, its forces and allies against missile attacks. Here’s what we know about U.S. missile defense policy — and how to interpret the new MDR.

Missile Defense Sounds Good - but there's a Catch:

A quick review of U.S. strategic policy can be helpful. Defending the US against a Russian or Chinese nuclear attack may seem like a no-brainer, but missile defense strategies can have dangerous consequences. In fact, during the Cold War, the US and Soviet Union signed the ABM Treaty to ban the deployment of homeland missile defense systems. This reassured arms-control advocates: With U.S. and Soviet homelands remaining vulnerable to a devastating counterblow, neither side was likely to launch a nuclear attack. In 2002, the US withdrew from the ABM Treaty so it could focus on defending against emerging missile threats from countries such as North Korea. But Washington reassured Moscow that missile defense deployments would remain limited and aimed only at smaller states.

The risk today is that both Moscow and Beijing may see any expanded missile defense as stepping up a suspected U.S. first-strike option — in a crisis, destroying their offensive nuclear forces by

While that solution may not be feasible today, the group could consider how a new global consensus about rules and norms could be achieved and what new enforcement mechanisms could work to help existing and future regimes with compliance and enforcement.

The longevity of the NPT has long been taken for granted in Washington and elsewhere. This can no longer be assumed, and whether via the conditions-based approach or other means, it is critically important that the United States devote considerable time and diplomatic capital to ensuring the treaty — and the benefits it provides to national, allied, and international security — endures.

attacking them pre-emptively. Even if ineffective against a full Russian or Chinese attack, a large-scale defensive system could make a U.S. first strike easier by intercepting any retaliatory Russian or Chinese missiles. This could prompt a new arms race, with U.S. adversaries building larger numbers of more capable missiles. And it could increase the incentives for Moscow or Beijing to attack the US first with nuclear weapons during a crisis because any delay could lead to destruction of their own forces.

The risk today is that both Moscow and Beijing may see any expanded missile defense as stepping up a suspected U.S. first-strike option — in a crisis, destroying their offensive nuclear forces by attacking them pre-emptively. Even if ineffective against a full Russian or Chinese attack, a large-scale defensive system could make a U.S. first strike easier by intercepting any retaliatory Russian or Chinese missiles.

Why the Trump MDR Marks a Change: Some analysts suggested IN 2018 that the administration's much-delayed MDR would see significant change in U.S. strategy — and a stepped-up effort against the forces of Russia and China. We learned...that the MDR stops short of advocating a large-scale U.S. missile defense system. But sections of the MDR suggest that the administration is laying the groundwork for a change in this direction.

The 2019 MDR includes subtle language shifts that push the benefits of missile defense, calling it a “stabilizing” technology because it would limit damage to the United States and its allies, while making a successful strike more difficult. This moves away from the language of great-power reassurance the US has used since 2001. Previously, the Obama administration claimed that Russia and China had nothing to fear because U.S. homeland defense systems were not capable of intercepting a major strike. The 2019 MDR states that, even if not very effective, U.S. homeland

To deal with Russian and Chinese strategic nuclear forces designed to strike the US, however, the 2019 MDR accepts that, for now, “the US relies on nuclear deterrence” — the threat of nuclear war with Russia or China — to dissuade either power from attacking the US. The administration's short-term plans call for the installation of 20 additional interceptors at an existing facility in Alaska, radar upgrades and perhaps building one additional interceptor site.

defense would be used to protect the country against an attack “from any source” — presumably including the two great powers.

Shift to Russian and Chinese Regional Capabilities:

The 2019 MDR places new emphasis on defense against Chinese and Russian regional missile capabilities — the systems with enough range to strike U.S. allies and deployed forces. This is a policy change from the Obama administration's 2010 Ballistic Missile Defense Review, which sought to cooperate with Russia on missile defense and, while reserving the right to defend against all missile threats in Asia, held out the prospect of dialogue with China on missile defense and strategic stability. To deal with Russian and Chinese strategic nuclear forces designed to strike the US, however, the 2019 MDR accepts that, for now, “the US relies on nuclear deterrence” — the threat of nuclear war with Russia or China — to dissuade either power from attacking the US. The administration's short-term plans call for the installation of 20 additional interceptors at an existing facility in Alaska, radar upgrades and perhaps building one additional interceptor site — meaning that any protection of the U.S. homeland against Russian and Chinese missiles will remain extremely limited in the near term.

The MDR Talks Regional but Looks to Dual-Use

Technologies: The long-term technological developments that the 2019 MDR sets in motion may raise questions about whether the new U.S. missile defense strategy is really aimed at regional defense or whether the ultimate goal is a defense against the strategic missiles Russia and China aim

at the U.S. homeland.

The MDR lays the groundwork for considerable integration between regional and strategic missile defense systems — including an expanded role for the SM-3 interceptor, originally designed to deal with regional threats, to strengthen U.S. homeland defense during a crisis with a small nuclear power like North Korea. But the MDR's statements about the possible role of homeland defense against Russia and China now make it likely that Moscow and Beijing will see this ambiguity between regional and strategic capabilities as a new threat to their strategic forces.

The U.S. ambiguity may be a deliberate move, in the context of the administration's emphasis on the value of missile defense in deterring attack through increasing adversary uncertainty. The MDR also places new emphasis on exploring options to intercept ballistic missiles in the "boost phase" of flight — shortly after launch and while the payload has yet to deploy — enabled by a new space-based sensor layer. The MDR suggests this may include fitting interceptors to the F-35 fighter, laser-armed drones and even space-based interceptors. The MDR emphasizes that these systems, if ever built, would be used only against rogue states. However, Moscow and Beijing are likely to remain skeptical because such a weapon could theoretically intercept advanced Russian and Chinese missiles.

And the MDR also outlines the need for greater integration of attack operations into U.S. missile defense planning — i.e., U.S. attempts to destroy enemy missiles before launch, in the case of "conflict with a rogue state, or within a region." This raises the possibility of integration of strikes and missile defense to limit damage in a regional conflict with Russia or China. But such planning highlights a fundamental problem with trying to

defend against nuclear threats. What one country calls pre-emptive defense can look like an offensive first strike. The dividing line between a regional and strategic conflict is a matter of perception — and one that may not be shared by all sides, particularly if the US is attempting to discriminate between regional and strategic missile forces in the fog of war.

Source: <https://www.washingtonpost.com>, 22 January 2019.

OPINION – James Goodby, Kenneth Weisbrode

Let's Talk about Nuclear Security — Informally

With the high-profile conclusion of Robert Mueller's investigation, a U.S. threat to withdraw from a nuclear missile treaty, a worsening political situation in Ukraine, an ongoing conflict in Syria, not to mention recent reports that the FBI began a counterintelligence investigation of President Trump, the citizens of Russia and the US should worry that their countries are soon reaching a point of no return. Diplomats will say that few such points exist, and that professionals can and will continue to keep the channels of dialogue open. What's missing here is not the capacity to talk but a political consensus on both sides to reaffirm why both countries still need to cooperate and how to go about finding it.

Mikhail Gorbachev and George P. Shultz recently called for a "broad strategic dialogue" among Americans and Russians to pull our nations out of their trough, or at least to look beyond it to a time like the one when they, along with Ronald Reagan, concluded that we were on a path to mutual destruction, and sold the world on the idea of getting rid of nuclear weapons rather than building more destructive arsenals. Gorbachev and Shultz propose an "informal forum," and that makes sense. The U.S.-Russia Bilateral

The MDR suggests this may include fitting interceptors to the F-35 fighter, laser-armed drones and even space-based interceptors. The MDR emphasizes that these systems, if ever built, would be used only against rogue states. However, Moscow and Beijing are likely to remain skeptical because such a weapon could theoretically intercept advanced Russian and Chinese missiles.

Presidential Commission, nuclear arms control talks, and other formal arrangements appear to be stalled. The establishment of dialogue at a higher level would probably be a nonstarter. What would an informal forum look like? It would comprise “the best minds of our nations,” as Gorbachev and Shultz suggest, and cover the range of bilateral security matters: “missile defenses, precision conventional weapons, space systems, cyber threats and the nuclear weapons of other countries.” There are several precedents for such an arrangement dating back to the immediate post-Cold War period, and even earlier. We worked with one in the 1990s between the Atlantic Council of the US and what was then known as the Russian Institute of World Economy and International Relations which, among other things, drafted the outlines of the START follow-on treaties.

Defining a new Euro-Atlantic order must be managed with all the nations that are now members of the Organization for Security and Cooperation in Europe. China, India, Japan and members of the European Union, as well as NATO countries and Asian allies of the US would also need to be consulted regularly.

The principal benefit of an informal forum is not its lower profile but its diversity. The members do not represent official bureaucracies. They are chosen for their special expertise, and may represent views that conflict with those of other members. The forum therefore would harmonize views among Americans and Russians, as well as contending positions on each side. This is the time-tested route to consensus — in theory. For this to work in practice, the forum will need buy-in from both governments. And it will need a precise mission that should begin with the most likely areas of broad agreement. We suggest Americans and Russians could:

Begin to work out the outlines of a security community in the Euro-Atlantic area, using the Helsinki Final Act of 1975 as a starting point. That document defined the shape of the post-Cold War order until the sanctity of existing national borders was challenged most recently by Russia's president, Vladimir Putin, in 2014 in Ukraine, and, according to him and other Russians, by NATO in the Balkans some years earlier. We need to return to a mutual acceptance of the Helsinki act's

language about peaceful change that prohibits the use of force in redrawing or modifying national borders.

Consider the threat posed to our countries and others by the proliferation of ballistic and cruise missiles. That would mean a review of cooperative defensive measures, including early warning systems and drones designed to shoot down missiles before they lift off, as well as agreed-upon limitations. The INF Treaty should be retained and compliance questions addressed. Contemplate relations in a world of multiple

nuclear states and several potential regional conflicts. The equation must include ability to cooperate in the interest of preventing conflicts and ending disputes in troubled regions of the world. Military-to-military cooperation must be a part of it.

Progress in each of these areas, of course, will

require the participation of others. Defining a new Euro-Atlantic order must be managed with all the nations that are now members of the Organization for Security and Cooperation in Europe. China, India, Japan and members of the European Union, as well as NATO countries and Asian allies of the US would also need to be consulted regularly. It is very likely that out of these consultations would come proposals for new security structures addressing new challenges. Americans and Russians could propose a framework for negotiations for doing so that builds upon their own informal forum. Gorbachev and Shultz have pointed us the right direction. It is up to the rest of us to furnish the means.

Source: <https://www.sfchronicle.com>, 20 January 2019.

OPINION – Park Sang-seek

How to Deal with a Nuclear North Korea?

North Korea says it has no choice but to become a nuclear state because it is the only way to defend itself from a nuclear attack from the US. This

reaction may be a justifiable but not wise counterstrategy. Let us assume that the US would resort to nuclear weaponry even if North Korea attacked South Korea with conventional weapons. The world would not condone such a brutal response...world opinion is likely to support the use of nuclear weapons only if the US-South Korean combined forces failed (or were likely to fail) to repulse the invading North Korean forces with conventional weapons. This is exactly the plan of the combined US-South Korean forces. By becoming a nuclear power, North Korea has discarded this "privilege." Perhaps it does not trust this Western strategy.

Instead of making the Korean Peninsula more peaceful, North Korea as a nuclear power would not only make the Korean Peninsula more insecure but would also result in North Korea becoming more isolated from the world and eventually becoming strangled by global sanctions, particularly the UNSC sanctions.

Kim Jong-un may say that the only way to safeguard North Korea from the overwhelming US-South Korean combined forces is to make North Korea a nuclear power. Is the North Korean justification realistic? Instead of making the Korean Peninsula more peaceful, North Korea as a nuclear power would not only make the Korean Peninsula more insecure but would also result in North Korea becoming more isolated from the world and eventually becoming strangled by global sanctions, particularly the UNSC sanctions. It has already suffered a serious decline in economic growth. So far, the North Korean leadership has been able to survive mainly because it has been able to feed its people barely above the survival level.

Moreover, even China may reconsider its unconditional support, mainly because it benefits more from a peaceful Korean Peninsula than a highly unstable one. If the Kim Jong-un regime continues to maintain its anti-US-South Korea alliance strategy, it will have the opposite effect:

If the US comes to the negotiating table, North Korea is most likely to put forward a peace treaty (a treaty to bring about the formal end of the Korean War). This peace treaty would undoubtedly include the following: a declaration of the end of the war, the complete withdrawal of foreign fighting forces and the non-use of nuclear weapons.

The US-South Korean alliance will be strengthened. Sooner or later, Kim will realize that a conciliatory policy toward both South Korea and the US is wiser than any plot to create a rift between South Korea and the US.

The idea of becoming a nuclear power seems to be based on the following reasoning: The US has no plans to abandon its strategy of providing a nuclear umbrella to South Korea. Therefore, North Korea has no choice but to have an equally powerful weapon to counter a US nuclear attack. It knows that US nuclear weapons are much more powerful than North Korea's. But it also knows that the

American people will never want to see their own territory attacked by a foreign enemy. Under this kind of threat, it is more likely that they would put pressure on their government to seek a compromise solution.

Second, even if Kim knows that such a strategy is a dangerous gamble, he cannot think of a better means to force the US to come to the negotiating table. If the US comes to the negotiating table, North Korea is most likely to put forward a peace treaty (a treaty to bring about the formal end of the Korean War). This peace treaty would undoubtedly include the following: a declaration of the end of the war, the complete withdrawal of

foreign fighting forces and the non-use of nuclear weapons. If the above is correct, the US is more likely to resort to powerful means to counterattack North Korea instead of coming to the negotiating table. This means a complete economic blockade against North Korea. Kim should refresh his memory about the basic strategy of the US toward North Korea's pursuit of nuclear weapons declared

by the US defense secretary and the head of the National Intelligence Agency on April 28, 2017. That strategy is called the "maximum pressure and engagement policy," and its stated aim is the unconditional denuclearization of North Korea.

Despite this warning, North Korea still clings to two conditions for denuclearization. One is that the US nuclear threat be completely removed first. The other is that the US forces around the Korean Peninsula be withdrawn because these US forces provide a nuclear umbrella. Kim has made a mistake: By developing nuclear weapons, he has made South Korea and the US more determined to maintain the US-ROK alliance and its nuclear weapons.

Because of these comprehensive economic sanctions, North Korea has been using the North Korean-Chinese border as a clandestine survival pipeline. Without China's secret support, North Korea is bound to suffer an extremely severe economic crisis. As long as North Korea seeks more concessions from the US in exchange for denuclearization, the possibility of a peaceful solution to the nuclear issue will diminish faster than before.

The best solution is negotiations between the US and North Korea toward the denuclearization of North Korea. The talks should be conducted according to the principle of the step-by-step and simultaneous implementation of both sides' obligations. Unfortunately, North Korea is likely to lose all of its quid pro quo as long as it delays the negotiations. Recently, North Korea has been making conciliatory gestures, mainly because it is completely isolated from the world and suffering immensely from the UNSC economic sanctions. All members of the UN are prohibited from exporting most oil products and new kinds of industrial equipment and heavy machinery to North Korea, along with iron, steel and other metals, as well as from importing industrial equipment and heavy machinery. They are also required to repatriate North Korean workers. Because of these comprehensive economic sanctions, North Korea has been using the North Korean-Chinese border as a clandestine survival pipeline. Without China's secret support, North Korea is bound to suffer an extremely severe economic crisis. As long as North Korea seeks more concessions from the US in exchange for

denuclearization, the possibility of a peaceful solution to the nuclear issue will diminish faster than before. The US can wait longer, but North Korea cannot afford to do so.

Under the circumstances, South Korea should be extremely careful not to violate the UNSC resolutions. Accordingly, South Korea should postpone the reopening of the Kaesong Industrial Complex until the nuclear negotiations between the US and North Korea results in an agreement. A simple and naive peace gesture from South Korea can hardly resolve one of the most difficult and dangerous issues in the world in the 21st century. Kim could use such a gesture as a means to prevent the North's

economic collapse or as a weapon to disrupt the close relationship between the US and South Korea. President Moon is willingly playing the role of mediator between the US and North Korea.

I sincerely hope and pray that he will successfully fulfil this precious but risky role of peacemaker, always bearing in mind the abovementioned trap. My personal experiences and studies show that communists never give up or compromise on their objectives. Some scholars in the West argue that North Korea's problem is that its leaders have a siege mentality, but I believe that they themselves created such a psychological war tactic and have been inculcating it in the North Korean people for the preservation of the Kim hereditary totalitarian system and for their antagonism toward South Korea. In view of this, the most important task for the Moon government is to persuade the North Korean leadership to abandon its archaic propaganda. I have always thought that if Kim Il-sung had not invaded South Korea in 1950, by now both Koreas would have achieved the final goal of the Korean people: reunification.

Source: <http://www.koreaherald.com>, 20 January 2019.

OPINION – Sebastien Roblin

Aircraft Carriers, Stealth Bombers and Nuclear Weapons: How China’s Military is Rising

On January 12, 2019, the Defense Intelligence Agency released an annual report highlighting the radical reorganization of China’s People’s Liberation Army to become faster-responding, more flexible and more lethal than ever before. The PLA was formed in 1927 as a Communist revolutionary force to oppose the Nationalist Kuomintang government and (later) invading Japanese forces.

Unlike Western militaries, the PLA remains loyal to the Chinese Communist Party, not a theoretical independent Chinese state. A cadre of political officers (commissars or *zhengwei*) still operate at every level of the command structure to ensure loyalty and manage personnel. Even after securing the mainland in 1949 and sprouting Navy and Air Force branches, the PLA adhered to a defensive “People’s War Strategy” which assumed that technologically superior foreign invaders (the United States or Soviet Union) would need to be lured deep into Chinese territory to be worn down by guerrilla warfare and superior numbers. Serious PLA modernization efforts began in 1991 when the trouncing of Iraq’s huge mechanized army in the Gulf War caused Beijing to realize its dated, World War II-style military was similarly vulnerable.

By 2004, a new doctrine focused on proactively defeating enemies *beyond* China’s borders, including through pre-emptive strike if necessary, as well as undertaking global governance missions befitting its superpower status. Between 2000 and 2016, while the Chinese economy averaged official annual growth rates around 7-8 percent, the PLA’s budget grew even faster at 10 percent. Despite that, the PLA’s current roughly \$200 billion dollar budget totals less than one-third of U.S. defense

spending. However, China pays much lower costs for hardware and personnel because of China’s “latecomer advantage” as the DIA report explains: “China has routinely adopted the best and most effective platforms found in foreign militaries through direct purchase, retrofits, or theft of intellectual property. By doing so, China has been able to focus on expediting its military modernization at a small fraction of the original cost.”

Prominent examples include China’s aircraft carriers and its J-11 jet fighters. By 2017, Chinese defense spending growth declined to 5-7% percent and the PLA shed 300,000 personnel, bringing it down to 2 million-strong—still the largest armed force on the planet. This transition sought to

China has routinely adopted the best and most effective platforms found in foreign militaries through direct purchase, retrofits, or theft of intellectual property. By doing so, China has been able to focus on expediting its military modernization at a small fraction of the original cost.

remodel the PLA into a leaner, more flexible force suited for fast-paced modern warfare. Indeed, that year Beijing fundamentally restructured how the PLA worked, consigning the traditionally dominant ground forces to their own branch on equal footing with the PLA Air Force, Navy, Rocket Force, and a brand-new Strategic Support Force.

This last addition combines satellite-launch and satellite-killing capabilities, with elite hacker and electronic warfare units to collect vital intelligence while disrupting the adversary’s own recon capabilities. Rather than being siloed in their respective branches, operational units now fall under five regional commands, each with its own Joint Operations Command Centre to enable air-, land- and sea-warfare branches of the PLA to rapidly coordinate using robust and redundant communication networks and inter-service chains of command. The theatre commands fall under the ultimate control of a Central Military Committee. The Army’s large division-sized units have mostly been dissolved, with assets devolved to seventy-eight combined-arms brigades mixing together armor and infantry with organic artillery and anti-

aircraft units. Special Forces and helicopter units also doubled in number. The new organization allows lower-ranking officers to act more flexibly without depending on higher headquarters for orders and support assets. However, the transition is proving culturally difficult for the traditionally hierarchy-obsessed PLA and complicates logistics and training for units now combining several types of equipment. Nonetheless, transforming rigid command and control and logistical systems, and rooting out endemic corruption, is one of the chief aims of the reforms. So is implementing realistic combat training emphasizing joint operations, instead of reputation-burnishing scripted exercises.

Beijing's Strategic Forces:

The PLA's huge Rocket Force has a diverse array of over a thousand ballistic and cruise missiles armed with both conventional and nuclear warheads, most of them short- or intermediate-range weapons to strike targets in Asia and the Pacific, as well as a smaller number of inter-continental ballistic missiles that can reach U.S. cities. New truck-launched DF-21D missiles may uniquely boast the precision-guidance capabilities to strike aircraft carriers hundreds of miles away from China. China's arsenal of around 300 nuclear warheads is primarily delivered by the Rocket Force, but the PLA Navy also operates nuclear-powered ballistic-missile submarines, which may soon have the ability to strike U.S. targets without sortieing far from the Chinese coast. In 2017, the PLA reintroduced a nuclear role for the Air Force, likely to be fulfilled by the forthcoming H-20 stealth bomber. However, Beijing has a no-first-use nuclear policy: it only plans to launch nukes if attacked with them first. A network of hardened underground facilities means the Rocket Force is likely to survive a first strike to inflict a retaliatory attack. China

China's arsenal of around 300 nuclear warheads is primarily delivered by the Rocket Force, but the PLA Navy also operates nuclear-powered ballistic-missile submarines, which may soon have the ability to strike U.S. targets without sortieing far from the Chinese coast. In 2017, the PLA reintroduced a nuclear role for the Air Force, likely to be fulfilled by the forthcoming H-20 stealth bomber.

does not stockpile biological or chemical weapons.

The PLA's New Mission: The PLA's strategic objectives have expanded from territorial defense to achieving regional military dominance over East Asia and the western half of the Pacific, as well as expansion into the Indian Ocean. Beijing eventually aims to displace or render indefensible the Pentagon's East Asian footholds, notably island bases in Guam and Okinawa and alliances with South Korea and Japan. Regional hotspots include a border dispute with India, potential instability in North Korea, and maritime sovereignty disputes with Japan, Vietnam and the Philippines.

Beijing also requires the PLA to maintain a credible capability for invading Taiwan, including fighting off or deterring U.S. intervention on Taipei's behalf. The PLA Navy operates Yuzhao-class

Landing Platform Docks, and its Marine Corps recently tripled in size to around 35,000 personnel in seven brigades. The Army also maintains six combined arms brigades equipped with amphibious tanks and infantry fighting vehicles. Operations other than war are also of increasing importance to the PLA, including suppressing protest and unrest in Tibet and Xinjiang—where reportedly hundreds of thousands of ethnic Uighurs have been placed in forced labour camps—as well as providing disaster relief and evacuating nationals abroad in emergencies.

Though the PLA is focused on fighting regional, not global conflicts, it's developing a limited capacity for global expeditionary operations—particularly evident in the opening of its first overseas base in Djibouti. Beijing is preparing the ground for additional overseas bases in Pakistan, Cambodia, Sri Lanka and various Pacific

islands. The introduction of huge new Y-20 “Chubby Girl” transport planes will significantly improve China’s global logistical capabilities. These technologies and reforms have only begun to address longstanding PLA deficiencies in command-and-control, logistics, unrealistic training and lack of recent combat experience.

Furthermore, while the PLA does field cutting-edge systems like the Type 99 tank, J-20 stealth fighter and Type 055 destroyer, roughly 40 percent of its armour and fighter units still use outdated 1950s-era hardware like Type 59 tanks, Type 63 APCs and J-7 fighters. The rapidly growing PLA Navy still relies on many noisy diesel submarines, and its two new carriers are less capable than U.S. nuclear-powered carriers. Despite these weaknesses, the radical reorganization of the PLA shows awareness at senior levels that overcoming the PLA’s shortcomings isn’t only a matter of procuring better technologies, but changing how the military uses them.

Source: <https://nationalinterest.org>, 19 January 2019.

OPINION – Rod Lyon

Extended (Nuclear?) Deterrence: What’s in a Word?

Over recent years, a somewhat geeky debate has emerged among the exponents of deterrence and assurance. Although the discussion typically occurs between Americans and nationals of an allied country, it’s overly simplistic to describe it as one between the US and its allies—the divisions aren’t that clear-cut. The debate is part philosophical and part phraseological. At its core sits a single adjective. Some Americans (including policymakers) say that what the US offers its allies is ‘extended deterrence’. But a number of allied nationals (again, including policymakers) find the phrase underwhelming; they’d prefer that it read

Naturally, an important stress test for the doctrine of extended nuclear deterrence is whether or not allies find it credible—that is, do they really believe that Washington would fight a nuclear war on their behalf when doing so would increase the risk of nuclear attack on the US homeland.

‘extended *nuclear* deterrence’. And so we come directly to the crux of the argument: the presence or absence of the word ‘nuclear’ in the assurance that the US provides to its allies. Some might find it difficult to imagine—in a world of great-power competition and faltering global order—that much of strategic consequence turns upon whether one particular aspect of US declaratory policy is best described by a noun with one adjective or a noun with two. But perceptions matter, so let’s unpack the distinction a little more.

The first adjective in the phrase (‘extended’, the adjective everyone can agree on) refers to geography. In essence, it says that the deterrent powers of the US arsenal are ‘extended’ to cover forward-based allies and not merely the US homeland. Since US alliances are transoceanic, that first adjective plays an important role.

But the second, disputed, adjective refers to a more specific commitment—an assurance that the deterrent effects of US nuclear weapons are extended to cover forward-based allies. The word ‘nuclear’ underlines the level of seriousness of American commitment towards its allies’ security. The first adjective focuses on the geography of obligation, the second on its intensity.

Allies tend to focus on the nuclear element of deterrence because, as signatories of the NPT, they’re not entitled to build nuclear weapons of their own. Either nuclear deterrence comes to them ‘extended’ by a nuclear-armed ally or it doesn’t come to them at all—unless, of course, they choose to withdraw from the NPT and develop their own nuclear weapons. That’s why proponents of extended nuclear deterrence often see it as the key to non-proliferation. Naturally, an important stress test for the doctrine of extended nuclear deterrence is whether or not allies find it credible—that is, do they really believe that Washington would fight a nuclear

war on their behalf when doing so would increase the risk of nuclear attack on the US homeland?

Michael Quinlan, the British strategic thinker, once described the ‘appallingly difficult dilemma’ that extended nuclear guarantees encountered: ‘how to give confidence to the forward members of an alliance in which nuclear power had for various reasons to be concentrated not in their hands but mostly in the hands of the rearmost member, on the far side of an ocean’. That confidence tends to be shaken even by small things—such as the omission of the second adjective from the phrase ‘extended nuclear deterrence’. Allies tend to see the full phrase as an important, if totemic, indicator of their own worth in the international order, whereas some in Washington probably see the phrase as entailing an unfortunately specific, and perhaps unnecessary, form of entanglement. By contrast, allies tend to interpret the phrase ‘extended deterrence’ as a specific form of abandonment, whereas some US policymakers see it as a mere statement of strategic fact—that effective deterrence depends on a spectrum of capabilities rather than mere nuclear threats.

It’s been said at the outset that this wasn’t simply a debate between the US and its allies. Sometimes US—and allied—declaratory statements shift around, using the phrases either interchangeably or in support of a broader messaging about the role of nuclear weapons in US strategic policy and their prominence in alliance relationships. The Trump administration’s Nuclear Posture Review, for example, uses ‘extended nuclear deterrence’ 11 times and ‘extended deterrence’ only six—in each case attempting to pick the version which best portrays the message it’s trying to convey. The second adjective typically appears in the context of strengthening US assurance of allies.

By contrast, the Nuclear Posture Review conducted under President Obama used ‘extended deterrence’ 13 times and ‘extended nuclear deterrence’ not at all. But that was a document published back in the halcyon days of 2010, when memories of Obama’s anti-nuclear speech in Prague the year before were still fresh, and the international security environment looked considerably more promising than it does today. In short, as international security has deteriorated, nuclear weapons have come more to the forefront of alliance politics—and the second adjective has returned.

A similar observation can just as easily be made about formal statements by US allies. The Australian government’s response to a set of questions asked by former Greens senator Scott Ludlam back in 2011, for example, shows a preference for the noun with two adjectives, even during the years of a Labour government. But it doesn’t need a particularly determined search of Hansard to show that ‘extended deterrence’ is used virtually interchangeably with its longer-format sibling. One final, real-world wrinkle deserves mention. The term ‘extended deterrence’ might seem to imply greater US

But in reality, America’s nuclear commitments to its allies remain robust under both formulations. Anyone who doubts that might like to read through section V of the Obama administration’s nuclear employment strategy. In practice, there’s less daylight between the two phrases than the debate presupposes. That there’s a debate at all turns upon the fluctuating level of confidence that sits at the heart of current alliance arrangements.

nuclear disengagement from its allies and, as I say above, perceptions matter. But in reality, America’s nuclear commitments to its allies remain robust under both formulations. Anyone who doubts that might like to read through section V of the Obama administration’s nuclear employment strategy. In practice, there’s less daylight between the two phrases than the debate presupposes. That there’s a debate at all turns upon the fluctuating level of confidence that sits at the heart of current alliance arrangements.

Source: <https://www.aspistrategist.org.au>, 22 January 2019.

NUCLEAR STRATEGY

CHINA

China is Likely Developing a Long-Range Nuclear Bomber

China is likely developing a long-range bomber capable of delivering nuclear weapons and a space-based early warning system it could use to more quickly respond to an attack, according to a new report from the US Defense Intelligence Agency. The development of the bomber, when combined with China's land-based nuclear weapons program and a deployed submarine with intercontinental ballistic missile technology, would give Beijing a "triad" of nuclear delivery systems similar to the U.S. and Russia, according to the report published on 15 January. "China is building a robust, lethal force with capabilities spanning the air, maritime, space and information domains which will enable China to impose its will in the region," the report's author, Lt. Gen. Robert Ashley, said in the introduction.

The report comes as President Trump's administration focuses on the potential for "great power" conflict with countries like China and Russia as part of its national defense strategy. It also comes amid heightened trade tensions between Washington and Beijing, and continuing disputes about China's posture in the South China Sea. Beijing's development of a nuclear-capable bomber would provide China with "its first credible nuclear triad of delivery systems dispersed across land, sea, and air — a posture considered since the Cold War to improve survivability and strategic deterrence," according to the report. Even without the bomber, China is progressing on its new Jin-class nuclear submarines which, armed with JL-2 ICBMs, are "poised to contribute to China's nuclear deterrent once they begin strategic patrols in the near future," DIA said. The DIA assessment released on 15 January underscores that China maintains a "no first-use" nuclear policy but adds that there

is "some ambiguity, however, over the conditions under which China's NFU policy would apply."

Despite a slew of disputes over Taiwan, the South China Sea and global trade, the review also says there is no indication in Chinese military strategic documents that Beijing views war with the U.S. as looming. Moreover, while China's defense spending climbed an average of 10 percent per year from 2000 to 2016, total spending remains "significantly below" the U.S., the report said. Spending was about 1.3 percent of gross domestic product from 2014-2018, compared to more than 3 percent of GDP for the U.S. over the same period.

The DIA assessment released on 15 January underscores that China maintains a "no first-use" nuclear policy but adds that there is "some ambiguity, however, over the conditions under which China's NFU policy would apply."

China is trying to strike a balance between expanding its capabilities and reach without "alarming the international community about China's rise or provoking the US, its allies and partners, or

others in the Asia-Pacific region into military conflict or an anti-China coalition," the report adds. Underlying China's concerns are its view that the U.S.-led security architecture in Asia seeks to constrain its rise and interfere with its sovereignty, particularly in a Taiwan conflict scenario and in the East and South China Seas, said DIA.

The DIA's observations will likely be used by proponents of the Pentagon's drive to modernize the U.S. aging nuclear weapons infrastructure over 30 years, an effort that, when operations and support costs are included, could total about \$1 trillion. The report also gives credence — albeit in hedged judgments — to claims that China is developing a robust capability to disable U.S. satellites, an undertaking some officials have used to justify higher spending to harden spacecraft and create a separate "Space Force" supported by Trump but questioned by many at the Pentagon. Chinese military strategists "regard the ability to use space-based systems and deny them to adversaries as central to enabling modern" information warfare," according to the report. "Space operations probably will form an integral component of other PLA campaigns," it added, using an acronym for the People's

Liberation Army. As such, China “continues to develop a variety of counter space capabilities designed to limit or prevent an adversary’s use of space-based assets during crisis or conflict” in addition to the research and “possible development of satellite jammers and directed-energy weapons,” DIA said.

Source: <https://taskandpurpose.com>, 17 January 2019.

China has ‘Underground Steel Great Wall’ to Protect Nuclear Weapons from Potential Attacks

China has built an “Underground Steel Great Wall” below the mountains to hide its nuclear weapons from the potential attacks, said a top Chinese defence scientist...Qian Qihu, 82, said China’s “underground steel Great Wall” could “guarantee the security of the country’s strategic arsenal” against potential attacks, including those from future hypersonic weapons....He further said that the “Underground Steel Great Wall” is a series of defence facilities located deep under mountains. While the mountain rock is thick enough to resist enemy attacks, entrances and exits of these facilities are often vulnerable and Qian’s work was to provide extra protection for these parts.

China’s nuclear strategy follows the principle of “no first use” and requires the country to have the capability of withstanding a nuclear attack before it responds with its strategic weapons... Qian, who received the 2018 State Preeminent Science and Technology Award during a conference at the Great Hall of the People in Beijing on 8 January, said the “Underground Steel Great Wall,” is the “country’s last national defence line.” If other lines of defence including the strategic missile interception system, anti-missile system and air defence system fail to function against hypersonic missiles and recently developed bunker-busters, his work can still thwart such attacks, he said.

“The development of the shield must closely follow the development of spears. Our defence engineering

has evolved in a timely manner as attack weapons pose new challenges,” Qian said. He said the hypersonic weapons that move 10 times as fast as the speed of sound are capable of changing trajectory mid-flight and penetrate any anti-missile installations.” National defence challenges do not only emerge from the development of advanced attack weapons but are also a result of an unpredictable international environment,” Qian said. He cited the recent US stance whereby the Trump administration is mulling lowering the threshold for nuclear weapons deployment....

Source: <https://www.financialexpress.com>, 14 January 2019.

INDIA

India’s Nuclear Doctrine Based on Policy of Minimum Credible Deterrence

India’s nuclear doctrine is based on a policy of minimum credible deterrence with a posture of no-first-use and non-use of atomic weapons against non-nuclear weapon states, Foreign Secretary Vijay Gokhale said on 14 January. Gokhale, in his keynote address at the 1st

Disarmament and International Security Affairs Fellowship organised by the Ministry of External Affairs, also said that India has an impeccable record of non-proliferation of advanced WMD technologies which has been acknowledged globally. “It is important to know that India was among the earliest advocates for the complete elimination of nuclear weapons. We continue to attach the highest priority to the goal of universal nuclear disarmament,” Gokhale said.

In fact, pending the elimination of nuclear weapons, India has put forward several proposals in a Working Paper on Nuclear Disarmament in 2006, he pointed out. “As a responsible nuclear power, our nuclear doctrine is based on a policy of minimum credible deterrence with a posture of no-first-use and non-use of nuclear weapons against non-nuclear weapon States,” he said. At

Underground Steel Great Wall,” is the “country’s last national defence line.” If other lines of defence including the strategic missile interception system, anti-missile system and air defence system fail to function against hypersonic missiles and recently developed bunker-busters, his work can still thwart such attacks.

the same time, he added India have called on all possessor states to engage in a meaningful dialogue to build trust and to reduce the salience of nuclear weapons.

"In this context, we have a robust civil nuclear programme with a range of societal applications, ranging from nuclear power generation to food security, health-care medicine and the use of radio-pharmaceuticals for diagnosis and therapy," Gokhale said. ... It is this range of technological capabilities, and India's impeccable record of non-proliferation of advanced WMD technologies, that has been acknowledged through its membership of the Missile Technology Control Regime, the Wassenaar Arrangement and the Australia Group, he said. ...

Source: <https://www.theweek.in>, 14 January 2019.

RUSSIA

Russia: New US Missile Strategy will Unleash Arms Race in Space

A renewed nuclear arms race would be a huge financial burden for Russia, whose economy is making a faltering recovery after years of low oil prices, a recession and Western trade sanctions. Russia said on 18 January that the new US missile defence strategy would unleash a dangerous arms race in space and amounts to a relaunch of the Cold War-era "Star Wars" program. US President Trump on 17 January unveiled a plan that envisages developing space-based sensors to detect incoming enemy missiles and exploring space-based weapons to shoot down missiles before they can threaten US soil.

A statement issued by the Russian Foreign

Ministry condemned the strategy as irresponsible and an act of confrontation, but made no mention of Moscow reciprocating with new plans to develop its own nuclear capability. Instead, the ministry called on Washington to think again, backtrack from its plans and engage in talks with Moscow to find agreement

It is this range of technological capabilities, and India's impeccable record of non-proliferation of advanced WMD technologies, that has been acknowledged through its membership of the Missile Technology Control Regime, the Wassenaar Arrangement and the Australia Group, he said.

on how to manage the world's nuclear missile arsenal. "The strategy, de facto, gives the green light to the prospect of basing missile strike capabilities in space," the statement said. "The implementation of these ideas will inevitably lead to the start of an arms

race in space, which will have the most negative consequences for international security and stability," it said. "We would like to call on the US administration to think again and walk away from this irresponsible attempt to re-launch, on a new and more high-tech basis, the still-remembered Reagan-era 'Star Wars' program. "A renewed nuclear arms race would be a huge financial burden for Russia, whose economy is making a faltering recovery after years of low oil prices, a recession and Western trade sanctions." President Putin's approval rating, while still high, has fallen from its peak in 2014,

"A renewed nuclear arms race would be a huge financial burden for Russia, whose economy is making a faltering recovery after years of low oil prices, a recession and Western trade sanctions." President Putin's approval rating, while still high, has fallen from its peak in 2014, in part because of unhappiness about living standards and a drop in household incomes.

in part because of unhappiness about living standards and a drop in household incomes.

Financial Burden: The revamped US missile strategy cited concerns about the burgeoning capabilities of Iran, Russia, China and North Korea and said this required a review of US

capability. It marked a departure from the approach taken by Trump's predecessor, Barack Obama, to tamp down concerns among other major nuclear powers about expanding US missile defences. Even before the new US

strategy was unveiled, Moscow and Washington were at loggerheads over missile defence. The Trump administration has said it plans to withdraw from the 1987 INF treaty, on the grounds Moscow is flouting it. Russia though says it is in compliance, and that Washington is in fact in violation. In its statement about the new US strategy, the Foreign Ministry said: "It is openly confrontational in character, and once again demonstrates that Washington is trying to secure for itself unrivalled military supremacy in the world." It said Russia had made repeated offers to Washington to negotiate about nuclear arms control, but that these offers had been ignored or rebuffed. "We call on the US administration to display political will and, once and for all, engage in a joint search for ways to resolve the problems that have built up in the strategic field, before it's too late," the statement said.

Russia has itself been accused of flirting with a new nuclear arms race, an allegation it rejects. In March 2018, Putin announced that work was underway on an array of new Russian weapons which he said could hit almost any point in the world and evade US missile defences. The new weapons included a hyper-sonic, nuclear-capable missile called Avangard. Putin oversaw what the Kremlin said was a pre-deployment test of the new missile in December last year, and afterwards he declared it a complete success. Defending his stance, Putin said he was not trying to trigger a new arms race but rather to stop that from happening. By developing weapons capable of evading US defences, Putin said, he was showing US officials it was futile for them to beef up their own nuclear missile capability.

Putin said he was not trying to trigger a new arms race but rather to stop that from happening. By developing weapons capable of evading US defences, Putin said, he was showing US officials it was futile for them to beef up their own nuclear missile capability.

Russia's "decision to violate the INF Treaty and other commitments all clearly indicate that Russia has rebuffed repeated U.S. efforts to reduce the salience, role, and number of nuclear weapons," the administration wrote in a nuclear strategy document last year.

Source: <https://www.dhakatribune.com>, 21 January 2019.

RUSSIA-USA

Kremlin Says Russia is Ready to Work with US to Save Nuclear Arms Treaty

Russian Foreign Minister Sergey Lavrov on 16 January said the Kremlin is willing to work to salvage the INF Treaty, a nuclear deal signed between Washington and Moscow during the Cold War. He said that, during talks in Geneva earlier, he offered to allow U.S. experts to inspect a missile that the White House says violates the deal, but that the offer was declined, according to The Associated Press.

The U.S. negotiators instead insisted that the missile be destroyed. President Trump said in October that the U.S. would withdraw from the landmark pact after his administration accused Russia of violating the deal. Russia's "decision to violate the INF Treaty and other commitments all clearly indicate that Russia has rebuffed repeated U.S. efforts to reduce the salience, role, and number of nuclear weapons," the administration wrote in a nuclear strategy document last year. The pact bans all land-based missiles with ranges of 310 to 3,420 miles and includes missiles carrying both nuclear and conventional warheads. The original ban between Moscow and Washington resulted in 2,692 missiles being destroyed. Russia claims the missile's range and dimensions put the missile outside the scope of the INF, but U.S. Undersecretary of State Andrea Thompson maintained in a statement on 15 January that "Russia continues to be in material breach of the treaty."

Source: <https://thehill.com>, 16 January 2019.

USA

US Nuclear Weapons: First Low-Yield Warheads Roll off the Production Line

The US has begun making a new, low-yield nuclear warhead for its Trident missiles that arms control advocates warn could lower the threshold for a nuclear conflict. The NNSA announced in an email it had started manufacturing the weapon at its Pantex nuclear weapons plant in Texas, as ordered by Donald Trump's nuclear posture review (NPR) last year.

The NNSA said the first of the new warheads had come off the production line and that it was on schedule to deliver the first batch – an unspecified number referred to as “initial operational capability” – before the end of September. The new weapon, the W76-2, is a modification of the existing Trident warhead. Stephen Young, a senior Washington representative of the Union of Concerned Scientists, said its yield had most likely been cut by taking away one stage from the original two-stage, W76 thermonuclear device.

...The Trump administration has argued the development of a low-yield weapon would make nuclear war less likely, by giving the US a more flexible deterrent. It would counter any enemy (particularly Russian) perception that the US would balk at using its own fearsome arsenal in response to a limited nuclear attack because its missiles were all in the hundreds of kilotons range and “too big to use”, because they would cause untold civilian casualties.

Low-yield weapons “help ensure that potential adversaries perceive no possible advantage in limited nuclear escalation, making nuclear

employment less likely”, the 2018 nuclear posture review said. Many critics say that is an optimistic scenario that assumes there will be no miscalculation on the US side. “There are many other scenarios, especially with a president who takes pride in his unpredictability and has literally asked: ‘Why can’t we use our nuclear weapons?’”, Young said. ...

Source: Julian Borger, <https://www.theguardian.com>, 28 January 2019.

The Trump administration has argued the development of a low-yield weapon would make nuclear war less likely, by giving the US a more flexible deterrent. It would counter any enemy (particularly Russian) perception that the US would balk at using its own fearsome arsenal in response to a limited nuclear attack because its missiles were all in the hundreds of kilotons range and “too big to use.”

BALLISTIC MISSILE DEFENCE

RUSSIA

New Satellite Images Show Russian Anti-Satellite Weapon Systems

New commercial satellite imagery shows hidden launch areas of the Russian anti-ballistic missile and anti-satellite weapon system in the area of Plesetsk spaceport in northern Russia. In reports released by Russia's media, researchers said that launch areas of the newest PL-19 Nudol anti-satellite weapon system located at the Plesetsk military spaceport (approximately 800 km north of Moscow), at the ex-launch site of the Cyclone- the summer of 2017. The western site was ready; the construction of the eastern site was completed somewhat later.

Russia has developed new mobile weapon system to target communication and imagery satellites in low Earth orbit and counter enemy missiles targeting important industrial regions. The PL-19 Nudol anti-ballistic missile system should replace the current one — Soviet-era A135 anti-ballistic missile system.

Around the sites where preparations are underway for large-scale construction of infrastructure, deforestation and preparation of construction sites for facilities are being carried out. While Moscow claims that the Nudol is an anti-missile system, U.S. intelligence officials say the system is designed primarily for anti-satellite missions. Russia has developed new mobile

weapon system to target communication and imagery satellites in low Earth orbit and counter enemy missiles targeting important industrial regions. The PL-19 Nudol anti-ballistic missile system should replace the current one — Soviet-era A135 anti-ballistic missile system. It consists of the Don-2N battle management radar and three types of missiles installed on MZKT-792911 chassis.

The long-range version, based on the 51T6 and capable of destroying targets at distances up to 1500 km (930 miles), at altitudes up to 800,000 m; medium-range, an update of the 58R6, designed to hit targets at distances up to 1000 km (620 miles), at altitudes up to 120,000 m; and short-range (the 53T6M or 45T6 (based on the 53T6)), with an operating range of 350 km (215 miles) and a flight ceiling of 40,000-50,000 m. The long-range missiles will most likely be equipped with nuclear warheads, while the others will have kinetic energy warheads. According to military experts, the future of missile defense system Nudol and other modern S-500 missile system will form the basis for comprehensive, integrated aerospace defense system of Russia, which will include a variety of modern ground-based detection tools, which include included missile attack warning stations. Head developer of the complex is Concern PVO "Almaz-Antei". The development of long-range intercept missiles is probably done by OKB "Innovator". The Nudol was first successfully tested in late-2015.

US network CNBC also reported that Russia conducted the latest flight test of its new anti-satellite missile system in December 2018, according to two people with direct knowledge of a classified U.S. intelligence report. The anti-satellite missile flew for 17 minutes and 1,864 miles before successfully splashing down in its target area. In December 2014, the general designer of Almaz-Antey Pavel Sozinov said that in the near future the Russian military will receive domestic counterparts of US missile defense systems THAAD and GMD. At the same time, the analogue of GMD, Sozinov noted, is being created in the mobile version and should be more efficient than the system from the USA.

Source: <https://defence-blog.com>, 20 January 2019.

USA

The Next Six Months could Define America's Missile Defense for a Generation

When the Missile Defense Review was rolled out Jan. 17, it represented the culmination of almost two years' worth of work. So some experts were left scratching their head when they opened up the document and found a significant number of items that still need reviewed or hashed out, the majority of which involve a six-month study period.

...The review — expected by some to be a definitive layout of America's direction in missile defense — calls for 11 different follow-ups to be completed within six months. They are: Designating a service or defense agency with acquisition authority — by using the existing requirements-generation process — to find ways to defend the homeland against offensive cruise missiles.

The Army, the Joint Chiefs of Staff and the Missile Defense Agency will prepare a report that assesses the number of THAAD battery requirements needed to support worldwide deployments. The Navy and MDA must deliver a report on how the entire fleet of Aegis destroyers can be converted to become fully capable against incoming missiles, including ballistic missiles, within 10 years.

MDA and Northern Command must prepare a plan to "accelerate efforts to enhance missile defense tracking and discrimination sensors, to include addressing advanced missile threats," particularly focused on the homeland. The Air Force and MDA are on the hook for a joint report on how best to integrate the F-35 Joint Strike Fighter, including its sensor suite, into America's missile defense networks for both regional and homeland defense. The MDR posits that the F-35 could eventually be used to take out ballistic missiles during their boost phase, which experts have said is unlikely to be technically feasible.

The Department of Defense is looking at the potential to operationalize the Aegis Ashore Missile Defense Test Center location in Hawaii into a full-up missile defense site to counter potential missile launches from North Korea. MDA and the Navy will evaluate the option and develop

a plan that could operationalize the location within 30 days, if needed. MDA will study development and fielding of a space-based missile intercept layer capable of boost-phase defense, including the most promising technologies, estimated schedules, cost and personnel requirements.

A big point of emphasis from officials talking about the MDR is that they believe the acquisition and development of new technologies can and will go faster. To that end, the review calls for reviews of the current Warfighter Involvement Process, which determines missile defense requirements, in order to make sure commanders who will use the systems are involved early in the process of developing the systems and requirements.

While the Pentagon divides the world into regional areas of responsibility, the nations capable of threatening American assets or allies with missiles do not necessarily. The chairman of the Joint Chiefs as well as the head of U.S. Strategic Command are therefore ordered to come up with a plan for “optimal roles, responsibilities, and authorities for achieving greater transregional missile defense integration.”

Another requirement from the 2017 National Defense Authorization Act is for the designation of an office with acquisition authority specific to pre-launch attack operations — that is, someone who leads procurement of new technologies designed to destroy an enemy missile before it can take off. That agency must be identified within six months; after that happens, a larger review will begin to examine roles and responsibilities for updating operational doctrine in terms of left-

of-launch strikes.

And for a change of pace, the Pentagon will have nine months to research improvements for timely warnings on hypersonic and advanced cruise missiles launched at the U.S. homeland. At the completion of the study, the Office of Cost Assessment and Program Evaluation will initiate an analysis of alternatives for materiel solutions to provide early warning and attack assessment against these advanced threats, and their

integration into the nuclear command-and-control architecture.

Asked why the six-month studies were necessary after the length of the review, John Rood, undersecretary of defense for policy, said the issue isn't seeing if the technology is viable, but rather “the application of that technology to a specific mission, consistent with the vision put forward from the Missile Defense Review.” “When you're dealing with large organizations that are composed of a series of other large organizations, coordinating the efforts of

the team, if you will, around objectives, and getting them to work together to do those examinations is a substantial part of” the challenge, he added.

Source: Aaron Mehta, <https://www.defensenews.com>, 28 January 2019.

Trump Pledges to Protect America from Any Enemy Missile

When it comes to defending America against the threat of a missile attack from any nation, President Trump said... that “the goal is simple. It is to ensure we can detect and destroy any missile

While the Pentagon divides the world into regional areas of responsibility, the nations capable of threatening American assets or allies with missiles do not necessarily. The chairman of the Joint Chiefs as well as the head of U.S. Strategic Command are therefore ordered to come up with a plan for “optimal roles, responsibilities, and authorities for achieving greater transregional missile defense integration.

When it comes to defending America against the threat of a missile attack from any nation, President Trump said... that “the goal is simple. It is to ensure we can detect and destroy any missile launched against the United States, anytime, anywhere and any place.” Trump gave his remarks at the Pentagon at the announcement of the release of the 2019 Missile Defense Review.

launched against the United States, anytime, anywhere and any place.” Trump gave his remarks at the Pentagon at the announcement of the release of the 2019 Missile Defense Review.

Missile defense is so important in a time of rapidly evolving threats from around the world, he said. Adversaries are acquiring bigger and stronger arsenals. They’re increasing their lethal strike capabilities and they’re focused on building long-range missiles that can reach targets within the US. “As president, my first duty is the defense of our country,” he said. Trump then outlined six missile defense priorities, which he said will be reflected in upcoming Defense Department budgets: First, 20 new ground-based interceptors are being constructed, which will bring the total to 64, he said. Currently 40 GBIs are at Fort Greely, Alaska, and four are at Vandenberg Air Force Base, California. Second, DOD will focus on developing new missile defense technologies, such as more powerful sensors and radars that will be deployed to detect missile launches and track them so countermeasures can be taken.

Third, he said, that besides protecting “all American cities” from ballistic missile attacks; DOD will develop an effective missile defense against emerging advanced cruise and hypersonic weapons. Fourth..., a big part of future DOD budgets will reflect the importance of the space domain. “It will be a big part of both defense and offense. The system will terminate any missile launches from any type or place.” Fifth, he said bureaucratic obstacles that hinder speedy deployment of cutting-edge missile defense technologies will be eliminated. And finally, Trump said the U.S. will work with allies on missile defense protection, such as prioritizing the sale of American missile defense and technologies so they can be defended as well. The U.S. will also share with them early warning and tracking to detect missile launches.

DOD is pursuing the development of small but powerful lasers that can be mounted on unmanned aerial vehicles that could potentially destroy enemy missiles. According to the MDR, one impetus for the new missile defense strategy is that hypersonic glide vehicles are being developed by Russia and China that can fly at Mach 5 plus – meaning in excess of 5 times the speed of sound.

Other Missile Defense Information: During a news briefing following Trump’s remarks, Air Force Lt. Gen. Samuel A. Greaves, the director of the Missile Defense Agency, said a determination will be made where the new GBIs mentioned by the president will be placed, with more than one site now under consideration. Greaves added to the President’s remarks about cutting bureaucratic obstacles. He said DOD will pursue a disciplined acquisition process with timelines, disciplined milestones and decisions based on rigorous experimentation and analysis of the effectiveness of new missile defense technologies.

Michael D. Griffin, under-secretary of defense for research and engineering, noted that space-based sensors will enable “global awareness” of missile launches and targeting data and he added that “rapid progress” will be made in this endeavour. He also mentioned that more weapon systems are being developed for the F-35 Lightning II that will enable the aircraft to take out enemy missiles. The F-35 can already take out certain types of missiles, but not more advanced weapons such as hypersonics.

Also, the MDR report mentions that DOD is pursuing the development of small but powerful lasers that can be mounted on unmanned aerial vehicles that could potentially destroy enemy missiles. According to the MDR, one impetus for the new missile defense strategy is that hypersonic glide vehicles are being developed by Russia and China that can fly at Mach 5 plus – meaning in excess of 5 times the speed of sound. North Korea has successfully tested its road-mobile Hwasong-13 and Hwasong-14 intercontinental ballistic missile, which could potentially hit portions of the US. Also, Iran’s progress in its space program could shorten its path to an ICBM.

In particular, hypersonic weapons have been a concern because they can fly low, fast and can quickly change course. Therefore that makes them

hard to target, according to the MDR. The goal, perhaps in a decade, is to develop space-based sensors that can detect the launch of a ballistic or hypersonic weapon, the review explains. Ideally, the aim is to detect the missile at the initial boost stage and then use missiles or lasers to shoot these down or during the mid-course phase and hopefully, at least by the terminal stage when it's about to lock onto its target, it said. The new missile defense initiative is not a strategy for a preemptive strike, according to the MDR. It is purely a defensive action "if deterrence fails and conflict with a rogue state or within a region ensues." Russia and China have their own versions of missile defense already, the review notes.

Source: <https://www.globalsecurity.org>, 17 January 2019.

Space is New Arena for War, Donald Trump Says as He Unveils Missile Defence Strategy

Space is the new arena for war, Trump said on 17 January as he announced a major drive to update America's missile defence system and touted his "Space Force" proposal. The US president said that he wants a "layer" of sensors placed among the stars that can detect missile launches and will demand that the technology is funded in his next budget. The item was one of a host of improvements the Pentagon is attempting to make to its decades-old missile system, outlined in its new Missile Defence Review. It drew comparison to Ronald Reagan's costly and ambitious project to create a space-based anti-missile system at the height of the Cold War in the 1980s which was derisively dubbed "Star Wars" by critics.

Speaking at the Pentagon, Mr Trump explained the new strategy and insisted that now was the time to modernise to keep America safe. China, whose space programme is run by the Peoples Liberation Army, is launching more rockets into space than any other country these days "Our goal is simple: To ensure we can detect and

destroy any missile launched against the US - anywhere, anytime, anyplace," Mr Trump said.

The review picked out four countries that pose a missile threat to Americans on home soil – North Korea, Iran, Russia and China – and warned that adversaries were rapidly developing their programs. It said that North Korea posed an "extraordinary threat", in contrast to Mr Trump's declaration after meeting its leader Kim Jong-un last year that "there is no longer a nuclear threat". "We have some very bad players out there," Mr. Trump said. "We're a good player. But we can be far worse than anybody if need be."

Mr Trump named six priorities: Putting the defence of Americans first; developing new technologies; being prepared for all types of missile attacks; recognising space is now in play; removing obstacles to US projects; and demanding "burden sharing" from allies. It was his comments on space

that especially raised eyebrows. "We will recognise that space is a new war-fighting domain, with the Space Force leading the way," Mr Trump said. Space Force is Mr Trump's proposal – seemingly popular with his supporters – for a free-

Mr Trump named six priorities: Putting the defence of Americans first; developing new technologies; being prepared for all types of missile attacks; recognising space is now in play; removing obstacles to US projects; and demanding "burden sharing" from allies.

standing military department focussed specifically on space. Currently such issues largely fall under the US Air Force. The move has faced some opposition in the Pentagon, including from former defence secretary James Mattis, over whether the major reorganisation needed for its creation would be enough benefit. Mr Trump said that his next budget will invest in a "space-based missile defence layer". US officials have suggested a layer of sensors in space would help detect missiles moving at hypersonic speeds. "It's new technology," Mr Trump said. "It's ultimately going to be a very, very big part of our defence and, obviously, of our offence."

Another area Mr Trump focused on was removing "bureaucratic obstacles" that limit his administration's ability to develop its missile defence program. Late in 2018, the Trump

administration announced it was pulling America out of 1987 Intermediate-range Nuclear Forces treaty, which bans ground-launch nuclear missiles up to certain heights. The treaty has been a key plank of arms control for the last 30 years but the Trump administration argues that Russia has repeatedly violated its terms while other adversaries are not signed up. Mr Trump said on 17 January: "In the past, the US lacked a comprehensive strategy for missile defense that extended beyond ballistic missiles. "Under our plan, that will change. The US will now adjust its posture to also defend against any missile strikes including cruise and hypersonic missiles." "We are committed to establishing a missile-defense program that can shield every city in the United States. And we will never negotiate away our right to do this." Responding to the new strategy, the chair of Russia's upper house defence and security committee, Viktor Bondarev, said it would ramp up global tensions, according to Interfax news agency.

In its 'Missile Defense Review' report released on 17 January, the Pentagon said Russia and China were developing advanced cruise missiles and hypersonic missile capabilities that can travel at exceptional speeds with unpredictable flight paths which challenge the existing defensive systems. These are challenging realities of the emerging missile threat environment that US missile defense policy, strategy, and capabilities must address.

China has deployed 75-100 ICBMs, including a new road-mobile system and a new multi-warhead version of its silo-based ICBM. While Russia illegally occupies territory outside its borders, seeks to coerce and destabilise its neighbours, and flouts treaty obligations, China has adopted an increasingly assertive posture in disputes with its neighbours, many of whom are US allies or partners.

Source: <https://www.telegraph.co.uk>, 17 January 2019.

US Announces New Missile Defence System to Counter Threats from Russia, China

The US has announced a new missile defense policy aimed at addressing the challenges posed by Russia and China, which seeks to displace America in the Indo-Pacific region and has adopted an assertive posture in disputes over territorial boundaries with its neighbours. In its 'Missile Defense Review' report released on 17 January, the Pentagon said Russia and China were

developing advanced cruise missiles and hypersonic missile capabilities that can travel at exceptional speeds with unpredictable flight paths which challenge the existing defensive systems. These are challenging realities of the emerging missile threat environment that US missile defense policy, strategy, and capabilities must address, it said. ...

The report presents a comprehensive and layered approach to prevent and defeat adversary missile attacks through a combination of deterrence, active and passive missile defences, and attack operations to destroy offensive missiles prior to launch. This comprehensive approach to missile defense strengthens America's ability to protect the homeland, allies and partners and deters adversary threats and attacks, Shanahan said. It assures allies and partners, engages in diplomacy from a position of strength, hedges against future risk and preserves America's freedom of action to conduct regional military operations in defense of its interests,

Shanahan said.

"China seeks to displace the US in the Indo-Pacific region and reorder the region to its advantage," the report said. Offensive missiles play an increasingly prominent role in China's military modernisation, its coercive threats and efforts to counter US military capabilities in the Indo-Pacific, it said. China has deployed 75-100 ICBMs, including a new road-mobile system and a new multi-warhead version of its silo-based ICBM. While Russia illegally occupies territory outside its borders, seeks to coerce and destabilise its

neighbours, and flouts treaty obligations, China has adopted an increasingly assertive posture in disputes with its neighbours, many of whom are US allies or partners, the Pentagon said. "These include disputes over territorial boundaries, claims to contested island territory, and a campaign to build and militarise islands in the South China Sea. The military forces and doctrines of these and other States feature offensive missile capabilities that are growing rapidly in size, sophistication and prominence," the Pentagon said. "China can now potentially threaten the US with about 125 nuclear missiles, some capable of employing multiple warheads, and its nuclear forces will increase in the coming years. Beijing also is developing advanced technologies, such as MaRVs and HGVs," it said.

Observing that China is developing missile capabilities intended to deny it the capability and freedom of action to protect US allies and partners in Asia, the Pentagon said a key component of Beijing's military modernisation was its conventional ballistic missile arsenal designed to prevent US military access to support regional allies and partners. "China is improving its ability to strike regional targets, such as US bases and naval assets, at greater ranges with the addition of the growing number of medium and intermediate-range ballistic missiles. This includes sophisticated anti-ship ballistic missiles that pose a direct threat to US aircraft carriers," it said. The Pentagon said the wide-ranging developments in China's expansive offensive missile arsenal posed a potential nuclear and non-nuclear threat to US forces deployed abroad, and are of acute concern to US allies and partners in the Indo-Pacific region.

China is aggressively pursuing a wide range of mobile air and missile defense capabilities, including the purchase of S-400 systems from Russia, each with four interceptor missiles, and is developing additional theatre ballistic missile defense systems. It also has announced that it is

testing a new mid-course missile defense system. Russia considers the US and the NATO to be the principal threats to its contemporary revisionist geopolitical ambitions and routinely conducts exercises involving simulated nuclear strikes against America, the report said.

The Russian leaders claim that Moscow possesses a new class of missile, the hypersonic glide vehicles (HGV), which manoeuvre and typically travel at velocities greater than Mach 5 in or just above the atmosphere, it said. North Korea continues to pose an extraordinary threat and the United States must remain vigilant, the report said. "One of Iran's primary tools of coercion and force projection is its missile arsenal, which is characterised by increasing numbers, as well as increases in accuracy, range, and lethality," it said.

Source: www.millenniumpost.in, 18 January 2019.

USA-INDIA

US Discussing Missile Defence Cooperation with India

The cornerstone of US security and diplomacy in the region was its strong bilateral alliances with Japan, South Korea, and Australia, and emerging security relationships with others such as India. Beijing was seeking to displace the US in the Indo-Pacific and reorder the region to its advantage.

The US has confirmed that it has discussed potential missile defence cooperation with India. "This is a natural outgrowth of India's status as a 'Major Defence Partner' and key element of our

Indo-Pacific Strategy," stated the Pentagon's Missile Defence Review for 2019, unveiled by the Donald Trump administration. It noted that a number of countries in South Asia were developing an advanced and diverse range of ballistic and cruise missile capabilities.

Talking about the Indo-Pacific, the review said the cornerstone of US security and diplomacy in the region was its strong bilateral alliances with Japan, South Korea, and Australia, and emerging security relationships with others such as India. Referring to China, the review said Beijing was seeking to displace the US in the Indo-Pacific and reorder the region to its advantage. "Offensive

missiles play an increasingly prominent role in China's military modernisation, its coercive threats, and efforts to counter US military capabilities in the Indo-Pacific," it added. The review claimed that China has deployed 75-100 ICBMs, including a new road-mobile system and a new multi-warhead version of its silo-based ICBM.

Beijing also now possessed four advanced JIN class SSBN, each capable of carrying 12 new SLBM, the CSS-N-14. Consequently, China could now potentially threaten the US with about 125 nuclear missiles, some capable of employing multiple warheads, and its nuclear forces would increase in the coming years. Beijing also was developing advanced technologies, such as MaRVs and HGVs. While the US relied on deterrence to protect against large and technically sophisticated Russian and Chinese intercontinental ballistic missile threats to the US homeland, US active missile defence could and must outpace existing and potential rogue state offensive missile capabilities.

To do so, the US would pursue advanced missile defence concepts and technologies for homeland defence. The review said China was also developing missile capabilities intended to deny the US the capability and freedom of action to protect its allies and partners in Asia. A key component of China's military modernisation was its conventional ballistic missile arsenal designed to prevent US military access to support regional allies and partners. China was improving its ability to strike regional targets, such as US bases and naval assets, at greater ranges with the addition of the growing number of medium- and intermediate-range ballistic missiles. This included sophisticated anti-ship ballistic missiles that pose a direct threat to US aircraft carriers.

Source: <https://www.thestatesman.com>, 18 January 2019.

USA-ISRAEL

US Army Eyes \$373 Million Purchase of Israel's Iron Dome Missile Defense System

Only Iron Dome could meet US Army goal of implementing an interim missile defense capability by 2020. The US army has asked Congress to approve \$373 million to purchase two of Israel's successful Iron Dome missile interception batteries, the American defense website *Inside Defense* reported on 16 January, 2019. If approved, the sale would mark the first time Israel has sold a complete weapons system to the US, which rarely purchases weapons from foreign countries both due to their technological superiority over most countries as well as for national security reasons. According to *Inside Defense*, the army is seeking to acquire the two

Only Iron Dome could meet US Army goal of implementing an interim missile defense capability by 2020. The US army has asked Congress to approve \$373 million to purchase two of Israel's successful Iron Dome missile interception batteries.

Iron Dome batteries with 12 launchers, two radar systems, two battle management systems and 240 interception missiles by 2020 to provide US ground forces interim protection against unmanned air vehicles, mortars, rockets, artillery and cruise missiles in conflict zones around the world. The previously unreported decision was detailed to Congress in a 14-page document dated Oct. 26, 2018 by Army acquisition executive Bruce Jette, the report said.

"Based on an analysis of cost, schedule and performance, the Army [has decided to]: field two interim IFPC batteries of Iron Dome in [fiscal year] 2020," the Congressional document said, adding that it would concurrently explore the full adoption of the Israeli system by 2023. The Iron Dome, developed by Rafael Advanced Defense Systems, is a short-range missile interceptor and the first layer of Israel's three-tier missile defense array which also includes the medium-range David's Sling interceptor and the longer-range Arrow missile defense system. The different tiers of Israel's missile defense array are intended to protect against a wide variety of threats, from

rudimentary rockets and mortars to advanced ballistic missiles, aimed at Israel by various states and organizations: From Iran and Syria to Hezbollah, Hamas and Islamic State.

The US has reportedly been seeking a system to protect US ground forces from such threats in various conflict zones for several years now, and in the past has attempted to develop interceptor systems of their own. Only Iron Dome, however, could meet the US Army's mandated goal of implementing an interim cruise missile defense capability by 2020, according to the report. The US Army document submitted to Congress said that based on cost analysis and recent simulation results the Iron Dome system was the best option to fulfil immediate needs and requirements."The Iron Dome system provides the best value to the Army based on its schedule, cost per kill, magazine depth, and capability against specified threats," the Congressional document said.

In 2016, the US and Israel signed an unprecedented \$38 billion in military aid deal which included \$5 billion earmarked for the development of missile defense systems. The 10-year agreement signed under former President Obama came into force this year, and will see Israel receive \$3.3 billion per year in foreign military financing – up from \$3.1 billion – and \$500,000 in funding annually for missile defense until 2028. In addition to the \$38 billion aid package, US Congress in March 2018 approved a record-setting \$705 million budget for Israel's missile defense programs.

Source: <https://www.i24news.tv>, 16 January 2019.

NUCLEAR ENERGY

CHINA

China's Guangdong to have 26 Nuclear Reactors

China's southern Guangdong province is on a spree constructing nuclear power plants, with the

latest addition to the province's nuclear plant cluster in the city of Huizhou, 90 kilometres northeast of Hong Kong. Six reactors there will generate 50 billion kilowatt-hours per year to quench the province's thirst for electricity. The 120 billion yuan (US\$17.74 billion) megaproject, to be run by the state-owned China General Nuclear Power Corp (CGN), will bring the total number of nuclear reactors in Guangdong, a manufacturing powerhouse and China's largest provincial economy, to 26. CGN's ultimate plan is to boost that number to 46, spanning 11 plants, to power Guangdong's booming economy, whose gross domestic product in 2018 is tipped to hit the 10-trillion-yuan mark and surpass South Korea and Canada.

The 10-year agreement signed under former President Obama came into force this year, and will see Israel receive \$3.3 billion per year in foreign military financing – up from \$3.1 billion – and \$500,000 in funding annually for missile defense until 2028. In addition to the \$38 billion aid package, US Congress in March 2018 approved a record-setting \$705 million budget for Israel's missile defense programs.

The new reactors in Huizhou, already given the go-ahead by China's environmental watchdog, will be built around China's indigenous, third generation Hualong (China Dragon) pressurized water nuclear reactor standards. The total power generation capacity will be equivalent to Hong Kong's annual

electricity consumption, according to CGN. China's Hualong reactors are modeled after France's three cooling loop reactor design. In the event of an emergency, they are capable of automatically shutting down fission reactions and cooling down reactor cores to safe levels within 72 hours, to avoid reactor core meltdown which triggered the devastating nuclear disaster and leakage at Japan's Fukushima Daiichi Nuclear Plant in March 2011. The reactors to be installed in Huizhou also feature 4.5-meter thick metal and concrete containment domes as an extra layer of protection to minimize the risk of fallout. A combination of both passive and active safety systems with a double containment dome underpins the safety standards and "infallible" operations of the Hualong reactors, according to CGN and Guangdong officials.

The first Hualong reactor went live in Fujian province in 2017. Still, concerns are being raised

about the safety of so many nuclear plants, including Daya Bay, Ling'ao, Taishan, Lufeng, Yangjiang and Huizhou, within a radius of about 100 km from Hong Kong and Macau. Guangdong's aggressive plans to harness nuclear energy have long stoked fears about safe operations and the disposal of spent fuel rods. CGN has sought to allay misgivings by promising more transparent consultation, reactor management and notification of incidents, but the company has given scant information about the Huizhou plant, the built-in safety infrastructure and contingency plans. The company told Xinhua that the National Nuclear Safety Administration would conduct a further assessment of the plant's design and safety facilities and decide the start of its construction.

Source: <http://www.atimes.com>, 17 January 2019.

INDIA

India's Details Nuclear Construction Plans

By 2031, India expects to bring 21 new power reactors online with a combined generating capacity of 15,700 MWe, according to Dr Jitendra Singh, the minister of state for the DAE and the Prime Minister's Office. He told parliament on 3 January that nine power reactors are currently at various stages of construction, including two units each in the states of Gujarat, Rajasthan and Haryana, and three in Tamil Nadu. All these units are scheduled to be completed by 2024-2025. Singh also noted that 12 further reactors had been accorded administrative approval and financial sanction by the government in June 2017. "Thus, 21 nuclear power reactors, with an installed capacity of 15,700 MWe are under implementation, envisaged for progressive completion by the year 2031."

Singh noted that five sites had been granted "in principle" approval to establish a further 28 reactors: Jaitapur in Maharashtra; Kovvada in

Andhra Pradesh; Chhaya Mithi Viridi in Gujarat; Haripur in West Bengal and Bhimpur in Madhya Pradesh. India currently has 22 reactors in operation at seven sites with a combined capacity of 6780MWe.

Earlier in January, Singh told parliament that North India's first nuclear plant was under construction up at village Gorakhpur in the Fatehabad district of Haryana. The first phase of the project, comprising two units (700MWe PHWRs), is expected to be completed in 2025. Most of India's reactors have previously been sited the South Indian states such as Tamil Nadu and Andhra Pradesh or the Western States such as Maharashtra and Gujarat.

The Haryana plant is expected to generate employment for over 2000 persons once it is in operation. Excavation work is in progress at an advanced stage. Land acquisition formalities have been completed and orders have been placed for long delivery equipment including end-shields and steam-generators.

The first phase of the project, comprising two units (700MWe PHWRs), is expected to be completed in 2025. The Haryana plant is expected to generate employment for over 2000 persons once it is in operation. Excavation work is in progress at an advanced stage. Land acquisition formalities have been completed and orders have been placed for long delivery equipment including end-shields and steam-generators.

Expenditure incurred on this project up to November 2018 was INR14,840 million (\$211m). However, the approved completion cost of the project is INR206 billion.

Source: <https://www.neimagazine.com>, 14 January 2019.

JAPAN

Koizumi Says Japan Must Say 'No' to Nuclear Energy

When he was prime minister, Junichiro Koizumi championed the use of atomic power to generate electricity. Then the 2011 earthquake and tsunami disaster struck, triggering a crisis at the Fukushima No. 1 nuclear power plant in Fukushima Prefecture. Koizumi, in office from 2001 to 2006, and widely regarded as one of Japan's most popular post-war leaders, started reading up on the nuclear issue,

and had a change of heart. Koizumi, 76, published his first book by his own hand titled "Genpatsu Zero Yareba Dekiru" (We can abolish all nuclear plants if we try) in December. It is available from Ohta Publishing Co. In it, he lambasts consumers for lacking a sense of crisis and simply believing a serious accident like the Fukushima disaster will never happen again in Japan during their lifetime. In a recent interview with *The Asahi Shimbun*, Koizumi said it was "a lie" to claim that nuclear power is "safe, low-cost and clean," although that is precisely what he espoused when he held the reins of power. Excerpts from the interview follow.

Q: An opinion poll by The Asahi Shimbun in February 2018 showed that 61 percent of people oppose the restart of idle nuclear reactors, and yet, reactors are successively being brought back online. What is your view about this?

A: Many people still support the zero nuclear power generation policy. When I teamed up with Morihiro Hosokawa, (a former prime minister), who ran for the Tokyo governor's election (in 2014), to call for abolition of nuclear power facilities, voters on the streets showed a positive reaction. But now many people do not realize how dangerous nuclear reactors are. They probably believe a nuclear accident will never occur again while they live because of all the attention that has been paid to safety since the Fukushima crisis.

However, in the 2012 report compiled by the government's panel to investigate causes of the disaster, the panel's chair said, "Things that are possible happen. Things that are thought not possible also happen." In other words, there are no totally safe technologies.

Q: Many people seemingly believe that they have no choice but to accept nuclear power because it costs less than other types of electricity generation and electricity rates are cheaper. Do you agree?

A: The argument is doubtful. Nuclear power is relatively cheap just because the government covers part of the costs. Nuclear plants cannot be operated without assistance from the government. Private financial institutions would

not extend loans to operators of nuclear facilities if the state did not provide guarantees. Were it not for governmental support and taxpayers' money, nuclear power would be more expensive than other kinds of energy. Renewable energy (such as solar and wind power) currently accounts for 15 percent of total power production in Japan. The percentage is much higher than before the Fukushima crisis. Even if costs slightly increase, citizens would accept the zero nuclear policy.

Q: Is it really possible to replace all the nuclear reactors with other sorts of power plants?

A: No reactors were operated for two years after the Fukushima disaster. But no power shortages were reported during the period. That means Japan can do without nuclear plants. It is a fact.

Q: During your tenure as prime minister (between 2001 and 2006), it emerged in 2002 that Tokyo Electric Power Co. had concealed problems at its nuclear facilities. Didn't that cause you to lose your trust in nuclear power even then?

A: No. Power supply is important and the risk of power failures could damage the economy. It was then said to be difficult to replace (nuclear plants that produced) 30 percent of the nation's electricity needs with other power sources.

As there were few facilities to generate power based on renewables at the time, I believed nuclear reactors were essential. I simply trusted the Ministry of Economy, Trade and Industry, which said "nuclear energy is safe, low-cost and clean." But that was a big lie. Although some people argued "nuclear plants are dangerous" even before the Fukushima crisis, I was deceived by the ministry and did not take their words seriously. I did some soul-searching and decided I ought to spread the word that Japan can do without nuclear plants.

Q: The issue of nuclear plants and their safety has hardly featured in recent national election campaigns. What's your take on this?

A: The construction of a nuclear reactor is estimated at 1 trillion yen (\$9.28 billion) now. Building reactors requires many materials; so

many companies are involved in the nuclear power business. Many tiny, small and midsize companies benefit from nuclear plants. Many of them insist that abolishing nuclear power would throw people out of work. Some labour unions that support opposition parties are engaged in the nuclear power generation industry, though the (main opposition) Constitutional Democratic Party of Japan says it is in favour of the zero nuclear power policy.

Q: What do you think is important in realizing a nuclear-free society?

A: Prime Minister Shinzo Abe insists nuclear plants are essential; so many lawmakers remain silent about the issue. But there are lawmakers even in the (ruling) Liberal Democratic Party who support the zero nuclear power policy. If Abe declares the state will abolish all nuclear plants, the situation will drastically change. Both ruling and opposition parties can cooperate over the issue. Why hasn't the government set dream-inspiring goals to promote solar, wind and geothermal power generation?

Q: Could you explain the words in your book that "it is regrettable and irritating that I was deceived"?

A: When meeting with Abe, I always tell him, "Be careful not to be deceived by the economy ministry." But he just smiles a wry smile and does not argue back. He should not miss the current political opportunity that he has the upper hand (to change the government's conventional nuclear energy policy).

Source: <http://www.asahi.com>, 17 January 2019.

KENYA

Kenya on Course towards First Nuclear Power Plant by 2027

The Ministry of Energy is seeking to have the country's first nuclear power plant commissioned

by 2027. Among the major challenges that nuclear energy development in the country has been facing is the lack of skilled personnel in nuclear energy, an impediment which the ministry is taking measures to overcome.

Through the Kenya Nuclear Energy Board (KNEB), the ministry has been training some of its personnel in Korea. The board has this year partnered with the University of Nairobi (UoN) to locally train professionals in this field, a move that will cut down the cost of training outside the country. "The country has a shortage of skilled human resource to work at nuclear power plants. The Ministry has sponsored 15 students to pursue

Masters degree in nuclear energy and related studies at UoN," said KNEB Communications officer Emmanuel Wandera.

Wandera who was speaking in Nakuru during a workshop, said that a team of experts have in the past six years conducted research in 26 counties to establish the most

appropriate location for the inaugural nuclear power plant.

Although the deadline for the first plant is 2027, this is subject to the passing of the draft Nuclear Regulatory Bill which was first tabled in parliament in November 2018 by majority leader Aden Duale. Kenya joins other African countries such as Ghana, Nigeria, Algeria and Uganda in the quest for nuclear energy. Last year Sudan entered into an agreement with Russia to build a nuclear plant for peaceful purposes starting mid of this year.

Source: Kennedy Gachuhi, <https://www.standardmedia.co.ke>, 28 January 2019.

UK

Nuclear is Less Costly than You Think

Does it make any sense to build nuclear plants in Britain? Not obviously, unless you are an atomic

The construction of a nuclear reactor is estimated at 1 trillion yen (\$9.28 billion) now. Building reactors requires many materials; so many companies are involved in the nuclear power business. Many tiny, small and midsize companies benefit from nuclear plants. Many of them insist that abolishing nuclear power would throw people out of work.

evangelist. In recent months, half the participants in the country's once-vaunted "nuclear renaissance" have packed their bags and departed. First Toshiba and then Hitachi dropped reactor projects, each citing their inability to get finance on terms that would deliver power to consumers at acceptable cost.

Critics point to the widening gap between the strike prices demanded by nuclear and renewable investors, highlighting the new low of £57.50 per megawatt hour for two UK offshore wind schemes due for delivery in 2022-23.

These are well below Britain's one live nuclear project, which gets £92.50 (in 2012 money) indexed for 35 years. In a letter to the *Financial Times*, business secretary Greg Clark said the government wanted nuclear's zero-carbon capacity, just not "at any price".

But is building nuclear really as uncompetitive as it is painted? Let's compare two hypothetical projects; one a nuclear plant producing 1 gigawatt of electricity, and the other an offshore wind project generating the same amount.

Now to get a similar amount of energy from offshore wind as from nuclear, you need more than just 1GW of nameplate capacity. The reactor will produce at a 90 per cent capacity factor and the wind farm about half that. So you need roughly 2GW. Then there's another problem: those moments when the wind doesn't blow for a protracted period. Bridging that with battery storage remains prohibitively expensive. So to protect against it, you need almost 1GW of back-up generation.

Now with nuclear and renewables, the main driver of the cost of the electricity is the capital devoured

by the project. So how does our hypothetical offshore scheme fare? The average price per kilowatt to build it is about £3,000, based on data in the 2018 Annual Technology Baseline compiled by the US National Renewable Energy Laboratory. Multiply that by 2 and that gives you £6,000 per effective kW. Then there's the back-up gas plant on top: a further £1,200/kW. So the total cost is about £7,200/kW.

Now compare that to the estimated cost of Hinkley Point, seen as an absurdly expensive project. That comes in at £6,400/kW, plus a further £3,000-£4,000/kW for financing costs.

Remember that nukes last at least twice as long as offshore renewables, meaning the latter will require a further round of capex in the reactor's lifetime. The apparent gap in prices shrinks.

So why are renewable projects able to post such low strike prices? One reason is that they don't bear all the costs on the network they generate, such as the need for back-up capacity that fires up only a few days a year, or being paid to switch off when there's too much wind. These costs are mutualised; something that's easier when renewables are a small part of the energy mix. They

don't disappear though. And the more renewables on the system, the more they intrude.

Of course, this is not a static picture. Renewable strike prices have fallen from £140-£150/MWh in 2014 to £82.50 for projects delivered this year. As efficiency improves, they should fall further. Technology may find solutions to intermittency, reducing the need for back-up power. But here's the other surprising news: nuclear can get cheaper, too. Analysis for the Energy Technologies

Critics point to the widening gap between the strike prices demanded by nuclear and renewable investors, highlighting the new low of £57.50 per megawatt hour for two UK offshore wind schemes due for delivery in 2022-23. These are well below Britain's one live nuclear project, which gets £92.50 (in 2012 money) indexed for 35 years.

Nuclear can get cheaper, too. Analysis for the Energy Technologies Institute (an organisation backed by the government and a number of energy companies) looked at 34 delivered nuclear projects round the world. While some first-of-a-kind schemes in Europe and North America came in at \$9,000-\$12,000/kW (£6,900-£9,200), 85 per cent came in at less than \$5,500/kW, and nearly 40 per cent at below \$3,500/kW (£2,700).

Institute (an organisation backed by the government and a number of energy companies) looked at 34 delivered nuclear projects round the world. While some first-of-a-kind schemes in Europe and North America came in at \$9,000-\$12,000/kW (£6,900-£9,200), 85 per cent came in at less than \$5,500/kW, and nearly 40 per cent at below \$3,500/kW (£2,700).

Much of that is down to time-saving efficiencies such as repeating the same design and having a more efficient supply chain. Low-cost projects don't just come from low-cost countries. Some of the cheapest were built in Japan and Korea.

Now, none of that is an argument for buying nuclear over renewables. Reactors last a long time, 60 years or more. There's a big opportunity cost to building lots if other cheaper solutions emerge. But in a world where Britain has a commitment to make stringent emission reductions, there are no simple, easy answers. On its present course, the country may end up with just 4.4GW of nuclear out of a 90GW system. That requires great faith in other technologies — whether renewables, interconnectors or others — somehow stepping up and delivering the goods.

Source: Jonathan Ford, <https://www.ft.com>, 27 January 2019.

USA

US Military Bosses Plan to Use Tiny Nuclear Reactors to Give Troops Power on the Battlefield

US Military bosses are developing truck-sized nuclear reactors that could power basecamps in remote areas. It is hoped the reactors, which will fit on a truck, could be deployed to the hard to reach bases - such as the hillside forward bases U.S. troops set up in places like Afghanistan. According to a government request discovered by Defence One, the 'Project Dilithium,' reactor should fit on a truck and a C-17 aircraft and generate from one to 10 megawatts of electric power for three years without refueling.

The Strategic Capabilities Office has already issued a request for information on a 'Small

Mobile Nuclear Reactor'. It hopes to fund prototypes of the system. 'Energy is a critical enabling component of military operations and demand for it will continue to increase over time,' the document says. 'The modern operational space has amplified the need for alternative energy sources to enable mobility in forward land based and maritime military operations.

'The Office of the Under Secretary of Defense for Research and Engineering, OUSD(R&E), acting through the Strategic Capabilities Office (SCO), is requesting information on innovative technologies and approaches to enable a future demonstration of a small mobile nuclear reactor prototype design.'

Soldiers will have to be able to build the reactor on site in 72 hours and take it down in a week - and the document specifies it must be 'meltdown-proof'. According to the document, the 'Core design must use high-assay low enriched uranium (HALEU) advanced gas reactor (AGR) tristructural isotropic (TRISO) fuel.' The office is looking to fund three different prototype designs and will then select a winner from among them.

The Army has long considered reactors, and in 1954, launched the Nuclear Power Program, under its Corps of Engineers developed a variety of nuclear reactor cores of different sizes. They were deployed to places like Fort Greely, Alaska; Sundance, Wyoming; Camp Century, Greenland; even a barge in Lake Gatun in the Panama Canal, according to Defence One. Currently, Idaho National Lab and Los Alamos National Lab are working toward new designs for modular nuclear power.

Source: Mark Prigg, <https://www.dailymail.co.uk>, 28 January 2019.

UZBEKISTAN

Uzbekistan Turns to Nuclear Energy to Power Economy

Country's decision to build first commercial reactor is latest move to boost GDP. When you run a large landlocked central Asian state rich in uranium and with big economic ambitions, what do you do?

You build a nuclear power plant. That has been the thinking in Uzbekistan, Central Asia's most populous country with about 33m people, and with the population and energy demand both forecast to grow. Tashkent has embarked on a range of reforms to open itself up to the world, improve the business climate and boost its economy since Shavkat Mirziyoyev in 2016 succeeded Islam Karimov, who had ruled the country for almost three decades, as president. The decision to build the first commercial nuclear reactor is the latest move to develop the Uzbek economy. The long-mooted project will involve Russian help that Mr Mirziyoyev has said provides "a strong impulse for co-operation between the states".

Together with Russian counterpart Vladimir Putin, Mr Mirziyoyev launched the initiative in Tashkent in October with the start of survey works for the plant, the only nuclear project in central Asia after Kazakhstan decommissioned its nuclear reactors in the late 1990s. Kazakhstan, the world's leading uranium producer, has been reluctant to launch new nuclear reactors because of public opposition as memories of the ecological harm from nuclear tests at the Semipalatinsk site in Soviet times remain strong. But Uzbekistan, itself the world's seventh largest uranium producer, sees the nuclear project as a pass into the "elite club" of nuclear powers, according to Jurabek Mirzamakhmudov, head of Uzatom state nuclear agency, which was established in July to lead national nuclear development.

"We will be joining the club of countries with peaceful use of nuclear energy. That is an elite club. This is a whole new level, different type of

relationships, new technologies, science and education development," he told the Financial Times. Stanislav Pritchkin, head of Central Asia and Caucasus group at the Institute of Oriental Studies at Russia's Academy of Sciences, said: "This is a positive achievement and big success of Shavkat Mirziyoyev. It would make Uzbekistan the first country in the region using a nuclear power plant and will make it a leading producer of electricity. "It adds to Uzbekistan's prestige but certainly follows a rational approach. Uzbekistan needs electricity. It often experiences gas shortages, and the nuclear power station project solves this issue. To be a regional power and to attract investors, Uzbekistan needs stable electricity supply."

Some 30 countries operated nuclear power plants as of the end of 2017; 20 had past or planned nuclear projects, according to the International Atomic Energy Agency. Uzatom and its strategic partner, Russia's state nuclear agency Rosatom, plan to build two reactors of the latest generation, starting the first in 2022 and launching it in late 2028, with the second following 18 months later, according to Mr Mirzamakhmudov. "The choice was made in favour of nuclear power given uranium availability and most importantly, economic benefits to the country. Today this is one of the cleanest, ecologically safest sources of power, as well as the cheapest one after hydropower," Mr Mirzamakhmudov said. Uzbekistan's current reliance on coal, gas, oil and hydropower will not be enough to meet growing demand, even with plans to double hydropower capacity by 2030.

Nuclear energy is expected to account for 15 per cent of the country's power balance and ensure

Kazakhstan, the world's leading uranium producer, has been reluctant to launch new nuclear reactors because of public opposition as memories of the ecological harm from nuclear tests at the Semipalatinsk site in Soviet times remain strong. But Uzbekistan, itself the world's seventh largest uranium producer, sees the nuclear project as a pass into the "elite club" of nuclear powers.

Nuclear energy is expected to account for 15 per cent of the country's power balance and ensure stable energy supply with expectations of power demand doubling by 2030, according to Uzatom. Uzbekistan was also taking steps to develop solar and wind energy, but would only rely on them for about 3 per cent of power generation in a decade as neither was a stable supply source.

stable energy supply with expectations of power demand doubling by 2030, according to Uzatom. Uzbekistan was also taking steps to develop solar and wind energy, but would only rely on them for about 3 per cent of power generation in a decade as neither was a stable supply source, said Mr Mirzamakhmudov. The project is of strategic interest to both Russia and Uzbeks. It will help Uzbekistan generate economic growth. It will enable the Russians, who are providing financial backing, to re-establish themselves as the primary regional power in terms of security and economic muscle, according to Camilla Hagelund, principal analyst at UK-based risk consultancy, Verisk Maplecroft. "Central Asia is often described as the soft underbelly of Russia. You have continued security issues in Afghanistan. Central Asia is like a buffer in between that and a potential security threat in its own right," she said.

Moreover, China had been expanding its influence in the region: "There is a level of competition between Russia and China, and it is very important for Russia to continue to demonstrate that it is the primary regional power for central Asia. "In part, it is an element of a wider ambition to be a great power. If you are not important in your local neighbourhood, then that undermines in essence that you're a global power," she added. Mr Putin has expressed hopes for deeper economic and trade co-operation. Other large Russian companies, including giant gas producer Gazprom and the second-largest oil producer Lukoil, already invest in Uzbekistan's gas processing industry, and may look to increase their involvement. Uzbekistan has said it is open to co-operation with any investors — "be they Russian, Korean, Chinese, or others", said Mr Mirzamakhmudov. If it chooses to export gas, its most likely buyers are Gazprom or neighbouring Kyrgyzstan or Tajikistan, according to state officials and experts. On top of this, revenue also may come from planned electricity exports to neighbours, primarily Afghanistan, Mr Mirzamakhmudov added.

Source: <https://www.ft.com>, 14 January 2019.

NUCLEAR COOPERATION

INDIA-UZBEKISTAN

Govt Signs Long-Term Contract with Uzbekistan for Uranium

The Indian government on 18 January entered into a long term contract with Uzbekistan to supply uranium ore concentrates to fuel the nuclear reactors. The contract was signed in the presence of Prime Minister Modi and Uzbekistan President Mirziyoyev, who are here for the Vibrant Gujarat summit that began on 18 January.... The agreement was signed between the DAE and Novoi Minerals & Metallurgical Company of Uzbekistan, the external affairs ministry said in a statement without offering more details. Meanwhile, the Exim Bank entered into an agreement with Uzbekistan to offer a USD 200-million credit line to finance housing and social infrastructure projects in the former Soviet republic, it said, adding this was announced by Modi during the official visit of Mirziyoyev in October 2018.

Mirziyoyev said he was keen on attracting Indian capital in areas like IT, education, pharma, healthcare, agri business and tourism. According to the World Nuclear Association, the landlocked Central Asian country is the seventh largest exporter of uranium in the world. New Delhi has been working on securing a stockpile of nuclear fuel for its strategic uranium reserve to sustain the country's nuclear reactors for the next five years so that the reactors stop functioning for want of fuel as had happened after the Pokhran II nuclear tests.

...Attempts are also being made to procure uranium from Australia. A nuclear cooperation pact between the two nations was signed in 2014 and came into force in 2015. After the Indo-US nuclear cooperation agreement, New Delhi's quest to have a uranium reserve got traction as importing fuel became much easier. Apart from domestic production, India currently imports uranium from Kazakhstan and Canada. This is primarily used to fuel its indigenously built pressurised heavy water reactors. Some uranium

is also produced from Russia. Apart from that, it has agreements in place to import uranium from Namibia and Mongolia.

Source: <https://www.moneycontrol.com>, 18 January 2019.

URANIUM PRODUCTION

UZBEKISTAN

Uzbekistan Creating Single Uranium Extraction Enterprise

Uzbekistan will create a unified state enterprise for extraction and processing of uranium in the near future, Trend reports via Podrobno.uz. The state enterprise will be organized using the Navoi Mining and Metallurgical Combine's assets. Nowadays, Navoi MMC ranks seventh in uranium mining and production of nitrous oxide in the world. It is the sole operator in Uzbekistan engaged in extraction of uranium and exporting finished products. Uzbekistan supplies its uranium to Japan. It also signed a seven-year \$300 million contract for uranium supply to the United States in 2017. Indian UCIL signed a contract in August 2014 with Navoi MMC to purchase up to 500 tons of Uzbek uranium per year in a period from 2014 to 2018. A new long-term contract was signed for exporting Uzbek uranium during Uzbekistan President Shavkat Mirziyoyev's visit to India.

Source: <https://www.azernews.az>, 21 January 2019.

NUCLEAR PROLIFERATION

IRAN-EUROPE

Why the Iran Nuclear Deal Still Matters for Europe

Three years ago, Iran and global powers implemented the JCPOA, curtailing the country's nuclear weapons programme in exchange for

sanctions relief. The deal continues to hang together – but only just. There are growing indications of signatory states' fatigue and frustration in attempting to prevent the collapse of the JCPOA, following the US withdrawal from it last May. In this climate, it is important for the deal's stakeholders to remember why it remains valuable:

- The JCPOA is the product of more than a decade of negotiation. The West worried that Iran's expanding nuclear programme posed a major nuclear proliferation risk. Most troublingly for Europe, there was a possibility that the US, Israel, or both would launch military attacks on a country of 80 million people. After the invasions of Afghanistan in 2001 and Iraq in 2003, Europeans wanted to avoid further instability in their neighbourhood.

Navoi MMC ranks seventh in uranium mining and production of nitrous oxide in the world. It is the sole operator in Uzbekistan engaged in extraction of uranium and exporting finished products. Uzbekistan supplies its uranium to Japan. It also signed a seven-year \$300 million contract for uranium supply to the United States in 2017.

- The JCPOA is imperfect for all sides. But it centres on a political compromise that addresses the core concerns of Iran and P5+1. According to US estimates, the JCPOA increased the period it would take Iran to create a nuclear bomb – its "break-out time" – from two or three months to roughly one year. In return, Tehran received relief from UN, EU, and US nuclear-related sanctions. Although the US has re-imposed the sanctions it originally lifted under the JCPOA, the UN and the EU have refrained from doing so.

- Under the JCPOA, Iran shipped out 98 percent of its enriched uranium; capped its level of uranium enrichment at 3.67 percent; removed two-thirds of its installed centrifuges; agreed to convert Fordow enrichment plant into a research facility; redesigned the Arak heavy water reactor; and provided international inspectors with broader access to its nuclear facilities. (For more on this, see ECFR's JCPOA explainer.)

- The IAEA, which oversees the JCPOA, has produced more than ten reports verifying that Iran continues to comply with the deal. The country has done so despite President Donald Trump's

abrogation of US responsibilities under the deal. Trump did so despite the US intelligence community's confirmation of IAEA conclusions on Iranian compliance.

Besides its nuclear benefits, the JCPOA created a political opening for the West and Iran to gradually ease their mutual hostility on the nuclear issue – and to perhaps work towards eventually normalising their relationship.

This normalisation is an outcome that Iran's foes in the Middle East fear most. Thus, Israel and Saudi Arabia have stepped up their efforts to precipitate the collapse of the JCPOA. The US withdrawal from the deal and "maximum pressure" campaign – as Trump calls it – is a gift to both this camp and to hardliners in Tehran, all of whom seek to undermine relations between Europe and Iran.

Europe faces growing pressure from the US, Israel, and Saudi Arabia to downgrade its ties with Iran at all levels and jump onto the maximum pressure bandwagon. The summit on the Middle East (which will reportedly focus on Iran) that the US and Poland plan to host in Warsaw next month forms part of this strategy to drive a wedge between Europe and Iran.

Until now, despite the difficulties facing the JCPOA, mounting US pressure, and recent strains on relations with Iran, European governments and the EU have continued to engage with Tehran. Europe's strong political commitment to the nuclear deal, not least through its promise to create a special purpose vehicle (SPV) designed to facilitate trade with Iran, is one of the key factors in the country's adherence to the JCPOA. Given the severity of the latest US secondary sanctions, Iran is likely to only continue complying with the nuclear deal if Europe, China, and Russia provide it with far more tangible reasons for doing so.

There are growing signs that Iran's patience will not last forever, especially given that its oil sales, a critical source of revenue for the country, have reportedly fallen by almost 60 percent since the US re-imposed its sanctions. Ultimately, all signatories to the JCPOA recognise that it will only fully function once the US re-engages with it in some fashion, at least easing its secondary sanctions on foreign firms that do business with Iran. Until then, Europe must maintain its efforts to hold the JCPOA together. This will require the registration and operationalisation of the SPV (while genuine work on the measure is under way, it is reportedly still weeks away from completion). China must also do its part to address the recent

decline in trade with Iran rather than waiting to see whether it can benefit from a European SPV.

The collapse of the JCPOA would create a real risk of further military conflict in the Middle East. Indeed, influential figures in the Trump administration, especially National Security Advisor John Bolton, have long advocated a US military

operation against Iran. As recent history suggests, such an intervention would come at a high cost for Europe – and it is an outcome that Europe must do all it can to avoid.

Source: <https://www.ecfr.eu>, 16 January 2019.

USA

Nuclear Instability at Levels not Seen since Cuban Missile Crisis, Says former US Ambassador

The risk of a global nuclear arms race has risen to a level not seen since the aftermath of the Cuban Missile Crisis of 1962, according to a former U.S. ambassador to Russia. In October, President Trump announced the U.S. will end its 1987 INF Treaty with Russia, accusing Moscow of violating its terms. At the same time, Trump has also called for billions of dollars of new spending on new missile defense programs.

Despite the difficulties facing the JCPOA, mounting US pressure, and recent strains on relations with Iran, European governments and the EU have continued to engage with Tehran. Europe's strong political commitment to the nuclear deal, not least through its promise to create a SPV designed to facilitate trade with Iran, is one of the key factors in the country's adherence to the JCPOA.

Speaking at the World Economic Forum in Davos on 22 January, the president of the Carnegie Endowment for International Peace and former US ambassador, William Burns, said a conflation of events was creating instability. "2019 could be as consequential a year for nuclear order since the immediate aftermath of the Cuban Missile Crisis where that brush with Armageddon cause the beginnings of a serious U.S./Soviet effort at arms control," Burns said.

The INF Treaty between the US and Russia was signed in 1987 and sought to eliminate nuclear and conventional missiles, as well as their launchers, with short ranges (310–620 miles) and intermediate ranges (620–3,420 miles). Burns said following U.S. accusations that Russia has developed a missile banned by the agreement he saw little prospect of the INF treaty being renewed and both sides would "walk away from it now." The former ambassador added that a separate 2010 "New START" arrangement, which sought to limit nuclear missile launchers and improve inspections, could also fall by the wayside when its terms expire in 2021. Burns said the bilateral breakdown between Washington and Moscow was putting pressure on the global situation when previously the two countries had acted in concert to prevent unruly actors or countries "For better or worse, America and Russia have unique capabilities and responsibilities on nuclear issues and when we are not living up to them it tends to inspire the worst behaviours on the part of other countries," said Burns. Trump's promise to spend billions on missile defense would also trigger a new arms race according to Burns who predicted a greater temptation in Beijing or Moscow to invest even more actively in offensive nuclear technology. ...

Source: <https://www.cnbc.com>, 22 January 2019.

NUCLEAR DISARMAMENT

INDIA

UN Lauds India for Training Foreign Diplomats on Disarmament

India is the first member country of the UN to have launched a fellowship programme on disarmament and international security for foreign diplomats. "This is a demonstration of India's commitment to nuclear issues and disarmament," a senior official of the MEA said. With its focus on

junior diplomats from a geographically diverse range of countries, the programme has a close parallel with the UN Programme of Fellowships on Disarmament, which was established in 1978 by the first special session of the General Assembly devoted to disarmament. Since then, more than 1,000 young women and men, drawn from the vast majority of member states, have been United Nations disarmament fellows. India has been one of the most active participants in the programme. The subsequent career paths of these fellows stand as an impressive testament both to the value of the training and to the high calibre of individuals selected to participate.

Within the framework of the fellowship programme, the External Affairs Ministry's Foreign Service Institute is hosting 27 young diplomats – all below the age of 35 – for three weeks until February 1. Countries that have sent participants include Vietnam, China, Bangladesh, Sri Lanka, Myanmar, Mongolia, Egypt and Ethiopia. The UN Under-Secretary-General and High Representative for Disarmament Affairs Izumi Nakamitsu and Foreign Secretary Vijay Keshav Gokhale inaugurated the first edition of the annual event on January 14. According to Nakamitsu, the value of engaging younger professionals and students

For better or worse, America and Russia have unique capabilities and responsibilities on nuclear issues and when we are not living up to them it tends to inspire the worst behaviours on the part of other countries.

India is the first member country of the UN to have launched a fellowship programme on disarmament and international security for foreign diplomats. "This is a demonstration of India's commitment to nuclear issues and disarmament."

in disarmament is not just a matter of investing in future potential. The UN Secretary-General's Agenda for Disarmament, released in May 2018, emphasizes the need to empower the young generation as the ultimate force for change.

Young people have worked at the forefront of successful international campaigns to ban landmines, cluster munitions and more recently nuclear weapons. "The cut-off age for your programme could not have been more appropriately chosen – every member of the staff of the ICAN was under the age of 35 when it was awarded the Nobel Peace Prize in 2017,"

Nakamitsu said. "Youth-led dialogue can offer a wellspring of creativity as we seek to understand possible threats from emerging technologies like cybertools, drones and artificial intelligence," she added. "Such creativity will be crucial as we seek to adapt how we pursue disarmament so that our efforts are relevant to other priorities, such as the 2030

Agenda for Sustainable Development, humanitarian action, the prevention and resolution of armed violence and the protection of the environment," the UN High Representative for Disarmament Affairs noted. Moreover, youth-led political coalitions have amplified the voices of women, who remain significantly underrepresented in intergovernmental disarmament processes. Only by ensuring the full and equal participation of women in all disarmament and international security processes can we apply the fullest range of ideas and talents to effectively address the formidable challenges facing our planet, Nakamitsu said.

India considered 65 member states of Geneva based UN Conference on Disarmament as the conduit for participants in the new fellowship programme. Based on geographical representation, 30 countries were finally selected and asked to nominate their diplomats. A key

criterion was that they should have prior background in disarmament issues. The programme covers a range of issues relevant to disarmament and international security such as global security environment, weapons of mass destruction, certain conventional weapons, space security, maritime cooperation, security of cyberspace, export controls, emerging technologies etc. The Fellowship Programme aims at equipping participants with knowledge and perspectives on various contemporary disarmament, non-proliferation, arms control and international security affairs.

Youth-led political coalitions have amplified the voices of women, who remain significantly underrepresented in intergovernmental disarmament processes. Only by ensuring the full and equal participation of women in all disarmament and international security processes can we apply the fullest range of ideas and talents to effectively address the formidable challenges facing our planet.

The resource persons for the programmes include senior officials from the UNIDIR, IAEA, Organisation for the Prohibition of Chemical Weapons (OPCW) and The Wassenaar Arrangement (WA) on Export Controls for Conventional Arms and Dual-Use Goods and Technologies.

... According to MEA officials, the programme also includes field visits to the Narora Atomic Power Station in Uttar Pradesh, Inland Container Depot at Tughlakabad and the ISRO. Explaining the background to this unique initiative, EAM official said India had organised a conference on UNSC Resolution 1540, which puts on the member states the onus to have domestic controls to prevent non-proliferation of nuclear and delivery materials. "We have organised different workshops on various aspects of export control and nuclear issues like 1540 and chemical weapons convention. But this is the first time that India is organising an umbrella programme which encompasses all related issues," the official said.

Inaugurating the programme, UN High Representative for Disarmament affairs Nakamitsu said India's offer to train officials in nuclear disarmament and international security is in line with one of the key aspects of the

disarmament agenda: investing in disarmament education, interpreted as one of the contributors for attaining Sustainable Development Goal 4, which calls for “promotion of a culture of peace and non-violence”.

The fourth pillar of the agenda is partnership. Achieving meaningful progress in disarmament also requires effective coalitions across the UN system, with regional organizations, and with scientists, engineers and

the private sector, and civil society. “It is in the last connection that I commend India for launching this fellowship programme. I believe such actions are in line with India’s historical role as a vocal champion for global nuclear disarmament,” said the UN High Representative for Disarmament Affairs. In this period of deteriorating strategic security relations and growing multipolarity, she added, all States that possess nuclear weapons, including India, have a special responsibility to pursue renewed dialogue, to seek reciprocal steps to reduce risks, and to lead efforts to return us to a common vision and path leading to the total elimination of nuclear weapons.

Source: <https://www.indepthnews.net>, 21 January 2019.

NUCLEAR WASTE MANAGEMENT

JAPAN–RUSSIA

Japan to Allocate \$17Mln for Radioactive Waste Storage Centre in Russian Far East – RosRAO

Japan will allocate more than 1.1 billion rubles (about \$17 million) to create a centre for conditioning and storage of radioactive waste in Russia’s Primorsky Region, Konstantin Sidenko, the director of the Far-Eastern branch of Russian state-run Radioactive Waste Management Enterprise RosRAO, said on 22 January. “RosRAO cooperates with its colleagues from Japan in the framework of international agreements. Thus, the Japanese side will allocate 1.158 billion rubles for the creation

of a regional centre for conditioning and long-term storage of radioactive waste. These funds will be used the purchase equipment for the management of radioactive waste,” Sidenko said at a meeting with local lawmakers.

Japan will allocate more than 1.1 billion rubles (about \$17 million) to create a centre for conditioning and storage of radioactive waste in Russia’s Primorsky Region, Konstantin Sidenko, the director of the Far-Eastern branch of Russian state-run Radioactive Waste Management Enterprise RosRAO.

Sidenko also stressed that Japan’s financial participation in the creation of the centre in no way meant that the country’s nuclear waste could be stored at the facility as it was prohibited

by Russian law to import and keep radioactive waste from abroad. “The agreement provides for the assistance of the Japanese side exclusively on the elimination of the Cold War legacy,” the chief of RosRAO’s branch added. The project aimed at the construction of the centre for conditioning and storage of radioactive waste in the region was launched back in 2013. The facility is scheduled to be put into operation in 2020. Meanwhile, local residents have expressed their concern over the construction of the centre, fearing that Japan might start piling up its own nuclear waste there.

Source: <https://www.urdupoint.com>, 22 January 2019.

USA

US to Offer Nuclear Waste Technology to Other Countries

The U.S. Department of Energy’s nuclear security office is developing a project to help other countries deal with nuclear waste. The information comes from two sources who spoke to the Reuters news agency. They asked not to be named because of the sensitivity of the issue. The sources say the plan aims to keep the United States competitive against other countries that are developing their own waste technology. For example, both Russia and France offer services to take care of nuclear waste.

Dov Schwartz is the spokesman for the National Nuclear Security Administration. He confirmed the

group is thinking about how to help other countries reduce nuclear waste. However, Schwartz did not give details. The NNSA also declined a Reuters request for an interview with Brent Park, who is leading the effort.

What would the Technology Do? The unnamed sources say the technology could involve crushing, heating or sending an electric current through nuclear waste to reduce its size. The machinery to do so would be put in a "black box" the size of a shipping container. It would be sent to other countries with nuclear energy programs; however, it would remain owned and operated by the United States, the sources said.

The sources did not name countries to which the service would be offered. They also did not say where the waste would be stored after it is run through the equipment. But they said they were worried the processes could increase the risk of dangerous materials reaching militant groups or

nations unfriendly to the United States.

Former U.S. President Jimmy Carter banned nuclear waste reprocessing in 1977. The reprocessing opens pure amounts of uranium and plutonium, both of which could be used to make nuclear bombs. NNSA spokesperson Dov Schwartz said the plans under consideration do not involve reprocessing. But he did not say what technologies could be used.

Concerns: The government of U.S. President Donald Trump has made promoting nuclear technology abroad a high priority. The U.S. Energy Secretary, Rick Perry, visited Saudi Arabia this month for talks on a nuclear energy deal with the kingdom. And the American business Westinghouse hopes to sell nuclear power technology to countries from Saudi Arabia to India.

Source: <https://learningenglish.voanews.com>, 27 January 2019.



Centre for Air Power Studies

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

Centre for Air Power Studies

P-284

Arjan Path, Subroto Park,

New Delhi - 110010

Tel.: +91 - 11 - 25699131/32

Fax: +91 - 11 - 25682533

Email: capsnetdroff@gmail.com

Website: www.capsindia.org

Edited by: Director General, CAPS

Editorial Team: Dr. Sitakanta Mishra, Hina Pandey, Anushree Dutta, Dr. Poonam Mann, Wg Cmdr Kaura, Sreoshi Sinha

Composed by: CAPS

Disclaimer: Information and data included in this newsletter is for educational non-commercial purposes only and has been carefully adapted, excerpted or edited from sources deemed reliable and accurate at the time of preparation. The Centre does not accept any liability for error therein. All copyrighted material belongs to respective owners and is provided only for purposes of wider dissemination.