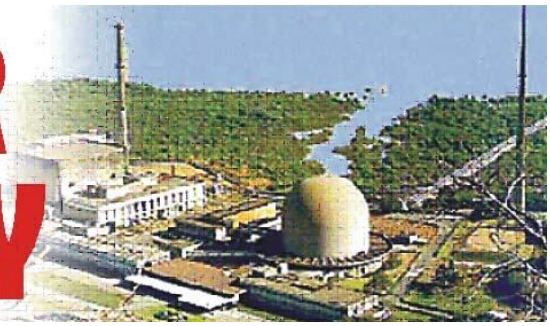
NUCLEAR SECURITY



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

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OPINION- Matthew Kroenig

Yesterday's Bipolar Nuclear Strategy Isn't Going to Cut It in Asia

In a region with nuclear powers declared, undeclared, and potential, the US needs a strategy to match. Much of what we think we know about the politics of nuclear weapons is derived from the bipolar Cold War nuclear rivalry between the United States and the Soviet Union. That's not going to help us in Asia.

Perhaps the world's most important center of geopolitical competition, the Asia-Pacific region is certainly its most complex nuclear security environment. It is home to established nuclear powers, such as Russia, China, India, and Pakistan; states that have significant "latent" nuclear capabilities, including Iran, North Korea, Japan, and South Korea; and a handful more that may yet seek to join the nuclear club. We need a better grasp of this changed Asian deterrence landscape and how it will affect US national security interests, for simply applying bipolar models from the past is inadequate and potentially disastrous.

At present, the major nuclear-armed states each have multiple nuclear-armed adversaries, and these competitor states are not aligned with one another US officials need to move away from thinking about US"nuclear strategy" in the singular and toward a new model of separate strategies, postures, and capabilities for each potential adversary. a traditional assured retaliation strategy may be sufficient to deter China, with its relaxed nuclear posture. But to counter Russia's nuclear "escalate-to-de-escalate" strategy, Washington must cultivate the ability to deter limited nuclear war.

The most important and fundamental differences with the Cold War are that, at present, the major nuclear-armed states each have multiple nuclear-armed adversaries, and these competitor states are not aligned with one another.

This has a number of important implications for US nuclear policy. First, US officials need to move away from thinking about US"nuclear strategy" in the singular and toward a new model of separate strategies, postures, and capabilities for each potential adversary. The old approach made sense during the Cold War when, for all intents and purposes, Washington faced a single nuclear-armed rival. But a single nuclear strategy does

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not work for a world with multiple nuclear adversaries. For example, a traditional assured retaliation strategy may be sufficient to deter China, with its relaxed nuclear posture. But to counter Russia's nuclear "escalate-to-de-escalate" strategy, Washington must cultivate the ability to deter limited nuclear war. And for plausible North Korea nuclear attack scenarios, it must also be prepared for nuclear preemption. The old approach made sense during the Cold War when, for all intents and purposes, Washington faced a single nuclear-armed rival.

Asian allies must question whether the US nuclear umbrella, which was originally extended to protect the US and allies from a specific nuclear threat, applies equally to each and every new nuclear danger that arises.

Second, extended deterrence and assurance are also challenged by Asian nuclear multipolarity. Asian allies must question whether the US nuclear umbrella, which was originally extended to protect the US and allies from a specific nuclear threat, applies equally to each and every new nuclear danger that arises. As growing Chinese and North Korean nuclear capabilities place the US homeland in ever greater danger, for example, East Asian allies wonder whether Washington remains willing and able to provide for their security. For decades, stability in East Asia has been undergirded by overwhelming US power and to preserve this equilibrium, Washington must strive to maintain a clear advantage in strategic capabilities over potential Asian adversaries.

Asia's multipolar nuclear environment increases the risks of nuclear instability that result from overlapping redlines and strategic dynamics. Layered against simmering tensions in the South China Sea, the Korean Peninsula, the Senkaku/Diaoyu Islands and elsewhere, there is a low but non-zero probability that the nuclear taboo could be broken in Asia.

Third, turning to arms races and arms control, the United States cannot only worry about traditional action-reaction arms race dynamics, but it must also be attuned to the possibility of action-reaction-reaction-reaction arms races as enhancements to US capabilities, in the form of missile defenses, hypersonic glide vehicles, or other new technologies, ripple through a string of nuclear powers from China to India to Pakistan, and perhaps others. This chain also creates opportunities, however, for new and more creative arms control arrangements between states in different positions that lock in asymmetric limits or that link unlike capabilities. For example, there may be room for negotiated constraints that allow Washington to assure Beijing that it does not seek to undermine China's nuclear retaliatory capability in exchange for China agreeing to grant a quantitative nuclear superiority to the United States.

Fourth, Asia's multipolar nuclear environment increases the risks of nuclear instability that result from overlapping redlines and strategic dynamics. Layered against simmering tensions in the South China Sea, the Korean Peninsula, the Senkaku/Diaoyu Islands and elsewhere, there is a low but non-zero probability that the nuclear taboo could be broken in Asia. These and other threats to nuclear stability should be addressed in official diplomacy, tabletop exercises, and Track II dialogues with both Washington's friends and enemies because the time to avoid nuclear escalation is now, not in the heat of a crisis. The challenges posed by a multipolar nuclear Asia are severe, but not insurmountable.

Fifth, and finally, the number of nuclear powers in the region is not magically capped. Washington must hold the line on future nuclear proliferation in the region and, where possible, take proactive steps to roll back existing nuclear capabilities. Past predictions of widespread proliferation in Asia have been exaggerated, but with each new nuclear power, the demand and supply-side drivers of nuclear pursuit increase, making future proliferation "cascades" more likely. Fortunately, there is also an element of good news as Washington and Beijing both have strong

incentives to limit additional entries into Asia's nuclear club. Dealing with North Korea will be difficult, but dissuading and halting nuclear programs in new proliferant states could become an important pillar of bilateral cooperation between Washington and Beijing for decades to come.

The challenges posed by a multipolar nuclear Asia are severe, but not insurmountable. In the past, the United States has managed to understand, adapt to, and thrive in equally challenging security environments. By following the above steps, there is reason to believe that addressing the challenges of a multipolar nuclear Asia will be no different.

Source: http://www.defenseone.com/, 15 July 2016.

OPINION- Kaveh L. Afrasiabi

Year One of Iran Nuclear Deal

14 July 2016 marks the first anniversary of the historic Iran nuclear agreement that, by all accounts, represents a net plus for both regional and global peace as well as nuclear non-proliferation. Achieved through marathon, both open and secret, marathon negotiations, the agreement, known as the Joint Comprehensive Plan of Action (JCPOA), is a complex international agreement that denotes international cooperation to bring to an end a vexing, and potentially dangerous, crisis, one that had resulted in comprehensive punitive sanctions on Iran crippling its economy. It is, by all accounts, in the interest of the international community, worth saving and defending — against its various opponents, including the hawkish anti-Iran lawmakers in US Congress, who are now keen on scuttling a major commercial deal between US and Iran permitted under the deal.

The latter refers of course to the nearly $18 billion dollar deal between Iran Air and Boeing, covering 109 aircraft for Iran's sanctions-hit airline industry, maliciously misinterpreted by the Republican lawmakers as a means of "weaponizing the Iranian regime." That is sheer nonsense and a clear sign of the degree to which Iran's opponents are willing to twist the facts in order to torpedo any tangible progress in the troubled US-Iran relations.

Few, if any, of the Iran-bashing US lawmakers are willing to concede the merits of the JCPOA, according to which Iran agreed to substantially reduce its civilian nuclear program, adopt the intrusive Additional Protocol, and allow extensive monitoring of its nuclear activities on a long-term basis, in exchange for the lifting of nuclear-related sanctions. According to the various reports by the IAEA, Iran has fully complied with its obligations under the JCPOA, even though the other side, i.e., mainly the US, has dragged its feet and fell short of full compliance, thus instigating loud complaints from Tehran.

During this past year, Iran's missile program has been a focus of controversy, with the US slapping new sanctions on Iran over Iran's multiple test-firing its conventional missiles, which it insists are purely conventional and for deterrent purposes, although both sides have been careful not to let this spoil the agreement, which went into effect in mid-January, 2016.

As the New York Times editorial on July 5, 2016 rightly put it, "It's important that Iran benefit from meetings its commitments." Unfortunately, the move by the US Congress to prevent the Boeing deal with Iran, which will have direct ramifications for the related $27 billion dollar Iran deal with Airbus, threatens the well-spring of the JCPOA and, should it pass both houses, then it ought to be vetoed by President Obama, who counts on the JCPOA as one of the shining examples of his legacy.

On the other hand, if the Boeing deal is blocked as a result of the Congressional meddling, then we are likely to witness a strong backlash against the agreement in Iran, in light of the strong criticisms of the US's inaction with respect to its obligations under the agreement. Chances are that Iran would retaliate by engaging in selective non-compliance, in order to send a strong signal to Washington regarding the rule of reciprocity. Bottom line, the JCPOA will go to waste if the Iranophobic politicians in US gain the upper hands

in dictating the nature of US's compliance with its (international) obligations.

Hopefully, the US realizes the risks to the JCPOA if Iran continues to be deprived of harvesting the economic benefits of the JCPOA, which has also benefited the cause of broader US-Iran diplomacy, such as with respect to anti-terrorism and the conflict in Syria.

Source: Kaveh L. Afrasiabi, Ph.D. is an Iranian-American political scientist and author specializing in Iran's foreign and nuclear affairs, and author of several books. http://www.eurasiareview.com/, 09 July 2016.

OPINION- Dave Majumdar

Why the US Navy Should Fear China's New 093B Nuclear Attack Submarine

Is China's new Type 093B nuclear-powered attack submarine on par with the US Navy's Improved Los Angeles-class boats? At least some US naval analysts believe so and contend that the introduction of the new People's Liberation Army Navy (PLAN) submarines is an indication of just how quickly Beijing is catching up to the West.

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"The 93B is not to be confused with the 93. It is a transition platform between the 93 and the forthcoming 95," said Jerry Hendrix, director of the Defense Strategies and Assessments Program at the Center for a New American Security—who is also a former US Navy Captain. "It is quieter and it has a new assortment of weapons to include cruise missiles and a vertical launch capability. The 93B is analogous to our LA improved in quietness and their appearance demonstrates that China is learning quickly about how to build a modern fast attack boat."

Other sources were not convinced that Beijing could have made such enormous technological strides so quickly—but they noted that the topic of Chinese undersea warfare capability is very classified. Open source analysis is often extremely difficult, if not impossible. "Regarding the question on the Type 093B, I really don't know, anything is possible I suppose, but I doubt it," said retired Rear Adm. Mike McDevitt, now an analyst at CNA's Center for Naval Analyses. "I have no doubt that the PLAN has ambitions to at least achieve that level of capability and quietness."

Though the Seawolf and Virginia-classes have surpassed the Improved Los Angeles-class as the premier US Navy attack submarines, such older vessels will remain the mainstay of the service's undersea fleet for many years to come. If the People's Liberation Army Navy's newest boats are able to match the capabilities of the US Navy's shrinking undersea fleet, Washington could be in serious trouble. Indeed, the US Navy already anticipated that it could be facing-off against a Chinese submarine fleet that is nearly twice its size, but not as technically capable.

The US Navy—which has roughly 52 attack submarines—is on track to have 41 attack boats by 2029. The Chinese, meanwhile would have "at least 70, and they're building," Vice Adm. Joseph Mulloy, the service's deputy chief of naval operations for integration of capabilities and resources told the House Armed Services Committee's seapower and projection forces subcommittee on February 25.

"You get back into the whole quality versus quantity issue, but at the same time the Russians are also building...and they build much higher-end submarines."

In a 2016 report to Congress, the Pentagon noted that Beijing continues to upgrade and expand its submarine fleet: "China continues to improve its SSN force, and four additional SHANG-class SSN (Type 093) will eventually join the two already in service. The SHANG SSN will replace the aging HAN class SSN (Type 091). These improved SHANG

SSNs feature a vertical launch system (VLS) and may be able to fire the YJ-18 advanced anti-ship cruise missile (ASCM). Over the next decade, China may construct a new Type 095 nuclear-powered, guided missile attack submarine (SSGN), which not only would improve the PLAN's anti-surface warfare capability but might also provide it with a more clandestine land-attack option."

The problem, however, is if Hendrix's assessment is correct and future Chinese submarines are only slightly less capable than the Virginia or Seawolf-class vessels, the Navy could be in trouble. The technological edge the US Navy—which is already woefully short on attack boats—is counting on might not be sufficient to counter Chinese numerical superiority. However, the service is continuing to improve the performance capabilities of its submarines on a continual basis. Nonetheless, one former US Navy undersea warfare officer suggested that the service would come to regret having truncated the high-performance submarine-hunting Seawolf-class at three boats and focusing instead on the more multi-role Virginia-class.

The technological edge the US Navy—which is already woefully short on attack boats—is counting on might not be sufficient to counter Chinese numerical superiority.

Aware of the coming attack boat shortfall, the US Navy is hoping to boost its attack submarine fleet by continuing to build two Virginia-class vessels per year even while it builds the next-generation Ohio Replacement Program ballistic missile submarine. However, if the Chinese are truly catching up technologically, Congress might consider accelerating the attack submarine build rate to the maximum capacity of America's two nuclear-capable shipyards. At the same time, the US Navy might have to accelerate the development of the next-generation successor to the Virginia-class, which has been tentatively designated the SSN(X) program and is scheduled to enter service in 2044.

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Source: The Author is the defense editor of The National Interest, http://www.scout.com/, 28 June 2016.

OPINION- Asim Bashir Khan

Is Pakistan's Nuclear Spending Exaggerated?

Pakistan's nuclear programme is of strategic importance in context of modern security paradigm and changing regional strategic calculus. For Pakistan, investing in modern non-conventional security assets serves as peace-preserving investment and safeguards country's territorial existence from multifaceted threats. Robert Crockett in National Security Implications of Eliminating Nuclear Weapons says "without nuclear weapons, Pakistan loses military parity," and would thus have an incentive to keep a nuclear-capable military. Likewise, another study Tough Talk Is Cheap: Washington's Real Options in Islamabad by Stephen D Krasner and Alexander Evans seconds this view and states "nuclear weapons work for Pakistan: they are a deterrent against a much larger and stronger India."

Pakistan's Nuclear Arsenal to Increase Significantly over Next 10 Years: SIPRI

There is a growing maligning propaganda about the nuclear programme of Pakistan, broadly with reference to its cost. The cost of Pakistan's nuclear programme is often reported with exaggerated and upward biased estimates. As a matter of ready reference estimates from few studies are mentioned below. The authors who have estimated the cost of Pakistan's nuclear programme have clearly mentioned paucity of the data in this context. Ramesh Thakur and John Page in Nuclear Weapons: The Opportunity Cost estimate a total cost of $2.2 billion for the year 2011 out of the core cost reported to be $1.8 billion.

Zia Mian and MV Ramana in Asian War Machines have estimated it costs $2.5 billion per year.

Exactly similar figure reported by Palash Ghosh in Pakistan Rapidly Expanding Nuclear Weapons Arsenal with reference to a report of Women's International League for Peace and Freedom. Another study by Mian, in Assuring Destruction Forever: Around the World says the Pakistan's nuclear spending is $800 million per year and adds up to $2 billion per year if environmental costs are included. The $1.2 billion cost of negative externalities is really hard to authenticate in the absence of comprehensive data and author's assumptions. The tendency of including environmental costs without data and background workings may overstate the estimates.

China Says More Talks Needed To Build Consensus on Nuclear Export Club

Bruce G Blair and Matthew A Brown, in Nuclear Weapons Cost Study: Global Zero reported a credible cost estimate of $781 million for 2009. As Mian they pointed out hidden costs pertaining to health and environment are significant. None of the studies mentioned above have enumerated assumptions, data, methodology and limitations. Therefore, these estimates are difficult to validate and authenticate. Not only the cost estimates reported by these authors is exaggerated and upward biased, they also lack supporting data.

I recently conducted a study titled The Price of Nonconventional Security on the latest cost estimates for 2014-2015. It defines a theoretical framework for direct and indirect costs and a practicable cost estimation methodology with certain assumptions and caveats. Adding budgetary allocations for primary institutions, imports data from International Trade Centre (ITC) and approximating human resource cost would cumulatively add to $1.1 billion, including cost of civil use of nuclear technology. This is even less than 1% of Pakistan's GDP. This estimated cost is in line with and validates Blair and Brown's estimate of $781 million for 2009 and Mian's estimate of $800 million for 2012.

This shows Pakistan's nuclear programme is very cost effective, for which Pakistan Army and allied civil nuclear institutions deserve much appreciation. No doubt, investing in nuclear programme is peace preserving investment and prevents the country from external aggression of whatever nature and magnitude.

The commitment for military security of such highest order is praiseworthy, but sill there is a dark side of state's neglect of human development. Pakistan's Human Development Index ranking is 146 out of 185 countries. Comparing nuclear-armed states, Page and Thakur in their study mentioned Pakistan's public spending on education and health is 2.4% and 0.8% of GDP, respectively, which is the lowest of all nuclear-armed states. This has further decreased to 2.1% and 0.4% of GDP as per Pakistan Economic Survey 2014-2015. The 2007 Fourth National Report for the Convention on Nuclear Safety emphasised Pakistan's future challenges are food, clothing, education, environmental degradation and its effects on health, irrigation and drinking water; and creating means of employment for the country's very large and growing population.

Pakistan seeks NSG membership to curb nuclear proliferation

It is need of the hour that state should focus on improving the socio-economic conditions of its citizens. For such social spending, institutional development, good governance and above all increasing tax collection across the board, are important determinants. An economically stable Pakistan would be conducive to democracy and political stability. As I concluded in my study: "Although military security is no doubt essential, it is high time for the state to assign a high priority to investing in human capital, lest the country's miserable state of human development continue indefinitely."

Source: The Author is a PhD scholar at Institute of Business Administration in Karachi, http:// tribune.com.pk, 11 July 2016.

OPINION-Richard Falk

Why Arms Control is the Enemy of Nuclear Disarmament

No First Use: Arms Control versus Disarmament Perspectives

I have long believed that it is important to disentangle the advocacy of nuclear disarmament from the prevailing arms control approach. The core difference in perspective can be summarized as follows: arms controllers seek to stabilize

nuclearism, reserving nuclear weapons for use as deterrent weapons of last resort; nuclear disarmers seek to get rid of nuclear weapons as reliably as possible, and forever; disarmers regard their possession, development, and potential use as deeply immoral as well as dangerous from the perspective of long-term human security.

President Barack Obama ever since his 2009 speech at Prague projecting a vision of a world without nuclear weapons has confused public understanding by straddling the fence between these two incompatible perspectives. He often talks like a potential disarmer, as during his recent visit to Hiroshima, but acts like an arms controller, as in the appropriation of $1 billion for the modernization of the existing nuclear weapons arsenal over the next 30 years or in NATO contexts of deployment.

Obama signaled his own confusion in two features of his Prague speech: first, indicating without giving any rationale (there is none) that achieving nuclear disarmament might not be achieved in his lifetime; secondly, avoiding any mention of the legal imperative of a good faith commitment to pursue nuclear disarmament that was unanimously endorsed by an otherwise divided court in the ICJ's Advisory Opinion of 1996.

There is a quite prevalent confusion among those constituencies that purport to favor nuclear disarmament of supposing that the adoption of arms control measures is not only consistent with, but actually advances toward the realization of their objectives. Such reasoning is deeply confused in my view. It is not just that most formulations of arms control regard nuclear disarmament, if at all, as an 'ultimate' goal, that is, as no goal at all falling outside the domain of policy feasibility.

Such an approach makes the advocacy of nuclear disarmament appear to be superfluous idealism, at best, and an imprudent challenge to deterrence and realism, at worst.

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Incidentally, the label 'advisory' is deeply misleading as this legal pronouncement by the highest judicial body in the UN System is the most authoritative interpretation attainable of relevant international law by distinguished jurists drawn from the main legal and cultural traditions active in the world. For such a diverse group to agree on the legal imperative of disarmament is notable, and for it to be ignored by a supposed advocate who is in a position to act is both revealing and irresponsible.

My view of the tension between the two perspectives can be briefly articulated: arms control measures unless tied to a disarmament scenario make the retention of nuclear weapons less prone to accident, inadvertent use, and unnecessary missions while reinforcing the logic of deterrence and indirectly expressing the view that a reliable nonproliferation regime is the best that can be hoped for ever since the nuclear genie escaped confinement. Such an approach makes the advocacy of nuclear disarmament appear to be superfluous idealism, at best, and an imprudent challenge to deterrence and realism, at worst. There is a coherent argument for such a posture, but it is not one that credible supporters of a nuclear zero or nuclear disarmament should feel comfortable with as it undercuts their supposed priority to eliminate the weaponry once and for all, although moving to zero by verified stages. This contrasts with the central undertaking of the arms control community to live with nuclear weapons as prudently as possible, which translates into nonproliferation, safety, prudent foreign policy, non-provocative weapons development and

deployment, and trustworthy crisis management.

Printed below is a recent editorial of the Arms Control Association proposing the American adoption of a no first use policy as a crucial declaratory step in advancing their agenda of nuclear prudence. Its line of argument well illustrates the overall nuclearist logic of the arms control establishment, which also tries to justify its proposal by showing that nuclear weapons are not needed to fulfill America's worldwide geopolitical ambitions. These ambitions can be satisfied in all circumstances, it is alleged, except a nuclear attack by a nuclear weapons state, by relying on U.S. dominance in conventional weaponry.

Here is a further issue raised: for states that possess or contemplate the possession of nuclear weapons, yet are vulnerable to conventional weaponry of potential adversaries, the implicit rationale of the Arms Control Association editorial is that such states have strong justifications for retaining, and even for developing such weaponry. In effect, countries such as Iran and North Korea can read this editorial as suggesting that they need nuclear weapons to deter surrounding countries with superior conventional weaponry from exerting undue influence via intervention or coercive diplomacy. In effect, the Arms Control Association no first use position, by treating that the U.S. Government and think tank policy community as its target audience, is undercutting the ethical and political rationale for nonproliferation as a rule of world order. As security is the acknowledged prime value in state-centric world order, an argument justifying nuclear weapons for the leading military power in the world is in effect providing non-nuclear states that feel threatened with a powerful argument for acquiring a nuclear deterrent.

A final clarification: I have long favored the adoption of a no first use policy on its own merits, including at the height of the Cold War. It not only underscored the immorality and criminal unlawfulness of any initiating use, but if properly explained could be taken as a vital step in a disarming process. As long as no such posture was adopted even by the US, with its formidable conventional military options, it meant that the potential use of nuclear weapons was never taken off the geopolitical table. This meant, as well, that the nuclear weapons labs were encouraged to envision potential roles for these weapons of mass destruction and design weaponry configured to carry out such missions.

In effect, a nuclear disarmament position also entails a repudiation of geopolitical ambitions to project worldwide military power as the United States has done ever since the end of World War II. This grandiose undertaking has weakened the UN, undermined respect for international law, and subverted democratic institutions within the United States and elsewhere, all while making the country more insecure than at any time in its history and its enemies more bold and aggressive. The common flaw of dominant political actors is to underestimate the will and capability of its militarily weaker adversaries to develop effective modes of resistance. Both the Vietnam experience and 9/11 should have imparted this basic message that the United States was endangering its future (and that of the world) by its posture of geopolitical hubris built on the false belief that the effective agent of change in the twenty-first century is military dominance. The nuclear dimension of this hubris is particularly dangerous, and ultimately debilitating.

Both the Vietnam experience and 9/11 should have imparted this basic message that the United States was endangering its future (and that of the world) by its posture of geopolitical hubris built on the false belief that the effective agent of change in the twenty-first century is military dominance. The nuclear dimension of this hubris is particularly dangerous, and ultimately debilitating.

It is long overdue to distinguish arms control from disarmament. Arms controllers have made such a choice, purging genuine advocates of disarmament from their ranks as dreamers. The arms control voice

is welcome in government even when their proposals are rejected because they collide with geopolitical goals. In contrast, the voice of disarmers is popular among the peoples of the world. Obama's Prague speech made such a worldwide social impact, and continues to resonate, because it was widely heard (incorrectly) as putting the United States firmly on a disarmament path.

There has been a groundswell of activity and investment in recent years surrounding advanced nuclear reactors. A dynamic group of nuclear engineers and scientists are chasing the future – and racing against China and Russia – to develop innovative reactor designs.

Unfortunately, after eight years of an Obama presidency it is as clear as ever that it is civil society alone that carried the disarmament torch during this period, somewhat backed by a series of non-nuclear governments that are not complicit beneficiaries of America's nuclear umbrella (e.g. Japan, South Korea, Taiwan). In this spirit, although not always sufficiently clear about the policy implications of their nuclear disarmament agenda, the best vehicle for those favoring nuclear disarmament is the Nuclear Age Peace Foundation and such initiatives as Chain Reaction 2016 and the Lawyers Committee on Nuclear Policy.

Will this new wave of innovative reactors live up to its promise For starters, these advanced reactors differ significantly from their predecessors. Rather than water, they use materials like molten salt or noble gasses as coolants. Most are considered "walk away safe," since they are designed to use the laws of physics, rather than equipment, to prevent accidents.

Source: http://newsclick.in/, 11 July 2016.

OPINION-Jim Inhofe, Sheldon Whitehouse, Mike Crapo & Cory Booker

The New Nuclear Renaissance

There has been a groundswell of activity and investment in recent years surrounding advanced nuclear reactors. A dynamic group of nuclear engineers and scientists are chasing the future – and racing against China and Russia – to develop innovative reactor designs. These technologies hold enormous promise to provide clean, safe, affordable, and reliable energy, not just for our country, but for the world. These innovators have a vision for the future, and they charge ahead backed by more than $1 billion in private capital. The future of nuclear energy is bright.

Some would argue that we have been here before. In 2005, Congress passed incentives to encourage a "nuclear renaissance" amid high natural gas prices. The industry stood ready to build a large number of modern light-water reactors, improved versions of existing nuclear technology.

But reality fell short of expectations and the result was only five new nuclear plants, with a price tag of $8 billion to $10 billion each. Now, in an age of low-cost natural gas, it is becoming harder for the nearly 100 existing reactors to compete. The Energy Information Administration calculates that electricity generation from a new nuclear plant would cost about 25 percent more than electricity from a new gas-fired combined-cycle power plant. This is causing some nuclear energy companies to scale back their operations. For instance, Chicago-based Exelon Corporation announced just a few weeks ago that it would shutter two of its nuclear plants in Illinois in the coming years, citing pressure from natural gas as a major factor.

So this begs the question: Will this new wave of innovative reactors live up to its promise? Investors think so, and so do we. For starters, these advanced reactors differ significantly from their predecessors. Rather than water, they use materials like molten salt or noble gasses as coolants. Most are considered "walk away safe," since they are designed to use the laws of physics, rather than equipment, to prevent accidents. If a natural disaster strikes, for instance, these reactors would simply shut down, substantially

reducing the threat of a meltdown. Many are designed to be small and modular, so they could be built in factories with construction costs that are a fraction of their big, custom-built forerunners. Small reactors could also be plugged into future micro-grid systems without requiring extensive transmission infrastructure. Some of these new reactor technologies could actually help to reduce the amount of nuclear waste we've accumulated through the years by using that waste as fuel. That could alleviate a major challenge facing the industry. And of course, all of this would be achieved without any air pollution.

Nuclear energy used to be just another partisan issue. Thankfully, that is changing. The four of us represent opposite ends of the political spectrum in the Senate, but we are all pulling in the same direction, backing various pieces of legislation to promote advanced nuclear innovation and development. One bill would open the doors of our national laboratories to entrepreneurs and their innovative new companies to develop public-private partnerships with the potential to bring new ideas to market. Another bill looks to build a sensible regulatory framework to allow diverse advanced reactor concepts to go from the drawing board to reality.

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These bills have been moving through Congress and are garnering broad bipartisan support. The Nuclear Energy Innovation Capabilities Act recently passed the Senate as part of a bipartisan energy bill, on an 87-4 vote. The Nuclear Energy Innovation and Modernization Act was approved by the Senate Environment and Public Works Committee on a 17-3 vote.

Though we may come to this issue for different reasons, our end goal is the same. We want to promote new technologies that provide cleaner energy and get them built by and for Americans. We can't take a back seat as China and Russia build test reactors and lure away American innovators. This new nuclear renaissance is primed for success. It has broad bipartisan support in Congress, serious private capital investment and the ability to help address environmental challenges – all while encouraging American innovation. The world is heading into a new age of nuclear energy, and the United States must lead the way.

Source: http://www.usnews.com/, 11 July 2016.

NUCLEAR STRATEGY

CHINA

Image Reveals China's New Nuclear Attack Submarine

A newly published image allegedly depicts the latest variant of the PLAs's Type 093 nuclear-powered attack submarine. In June 2016, the Chinese People's Liberation Army-Navy published an image purportedly depicting the latest variant of a Type-093B (also dubbed Type-093A) Shang-class nuclear-powered attack submarine (SSN). The picture appears to show PLAN sailors loading an anti-ship missile canister, a buoyant capsule, into a torpedo tube.

The submarine's conning tower ('sail') features diving planes. According to IHS Jane's Defense Weekly, a hydrodynamic structure after the conning tower "may be intended to help dissipate root vortices that emerge from the base of the sail, which can help reduce drag and noise." Analysts over at Popular Science, believe that the hump is a vertical launch system (VLS) battery blended into the hull. Indeed, Chinese media reported in the past that upgraded Type-093 boats will be equipped with VLS. China Daily claims that the new subs are capable of firing the PLAN's most modern supersonic anti-ship missile (ASCM), the YJ-18.

The vertically-launched YJ-18 ASCM is purportedly specifically designed to defeat the US Aegis Combat System and has often been described as

a "carrier killer." Interestingly, the YJ-18, however, was not displayed during last year's grand military parade in China, as I noted in September 2015. A 2016 Pentagon report to Congress on the Chinese military notes:

China continues to improve its SSN force, and four additional SHANG-class SSN (Type 093) will eventually join the two already in service. The SHANG SSN will replace the aging HAN-class SSN (Type 091). These improved SHANG SSNs feature a vertical launch system (VLS) and may be able to fire the YJ- 18 advanced anti-ship cruise missile (ASCM).

This new type of SSGN boasts improved speed, reduced noise, and an increased operational range, according to Chinese state media.

It has also been reported that the upgraded Type-093B subs are stretched versions of the original boats and feature a teardrop hull. Some analysts believe that this is due an attempt to accommodate a dry dock shelter for PLA Special Forces. As I reported previously, the Type-093 Shang-class boat depicted in the picture could also be a nuclear cruise missile submarine (SSGN), designated Type-093G, and fitted with a large stockpile of cruise missiles. This new type of SSGN boasts improved speed, reduced noise, and an increased operational range, according to Chinese state media. "The Type-093G is reported to be an upgraded version of Type-093... With a teardrop hull, the submarine is longer than its predecessor and has a vertical launching system," China Daily said.

The engine is expected to be showcased at the Army-2016 International Military Technology Forum, which is set to take place on 6-11 September 2016 in the Moscow Region. "The idea is that the bomber will take off from a normal home airfield to patrol Russian airspace. Upon command it will ascend into outer space, strike a target with nuclear warheads and then return to its home base.

As I explained elsewhere:

The Type-093G Shang-class are technologically on par with 1980s NATO nuclear-powered fast-attack submarines (i.e. roughly three decades behind current Western sub technology), according to some experts. The Taiwanese media reports that the upgrades on two Type-093G Shang-class subs were completed in December 2014 by the Bohai Shipyards in Huludao, while a third vessel is still in a dry dock.

Improved variants of the Type-093 Shang-class submarines are allegedly comparable to somewhere between the US Navy's Los Angeles-class "flight I" and the advanced "flight III' in terms of stealthiness and other capabilities. China is purportedly also working on an even more advanced variant of the Shang-class, designated Type-095. While no boat has been launched, the PLAN revealed a Type-095 sub simulator last year (See: "Revealed: China's New Carrier Killer Sub Simulator").

The Pentagon's Office of Naval Intelligence (ONI) said in a report that Type-095 submarines will "provide a generational improvement in many areas such as quieting and weapon capacity," in comparison to previous boats of the class.

Source: The Diplomat, 08 July 2016.

RUSSIA

New Russian Bomber to Be Able to Launch Nuclear Attacks from Outer Space

The Russian Strategic Missile Forces Academy is developing a hypersonic strategic bomber capable of striking with nuclear warheads from outer space, Lt. Col. Aleksei Solodovnikov told RIA Novosti ...A trial model of Russia's nuclear-capable outer space strategic bomber will be developed by 2020, according to its developer

Russian commander of the Strategic Missile Forces (SMF), Colonel General Sergei Karakayev, had earlier reported that the Russian Strategic Missile Forces Academy has already developed and tested an engine for the experimental aircraft. The engine is expected to be showcased at the Army-2016 International Military Technology Forum, which is set to take place on 6-11 September 2016 in the Moscow Region. "The idea is that the bomber will take off

from a normal home airfield to patrol Russian airspace. Upon command it will ascend into outer space, strike a target with nuclear warheads and then return to its home base," Solodovnikov told RIA Novosti.

..."We are cooperating with Russia's Central Aerohydrodynamic Institute on the design of an airframe and the aircraft's characteristics. I think that its lift-off mass must be 20-25 metric tons for it to be a strike aircraft. It will [be able to accelerate to] hypersonic speed in rocket mode," he added.

Source: http://sputniknews.com/, 12 July 2016.

USA-SOUTH KOREA

S. Korea, US Reach Decision to Deploy THAAD Defense System In Korea

South Korea and the US have agreed to deploy a high-tech antiballistic-missile interception system in the Northeast Asian country to upgrade the allies' defense against North Korea's increasing nuclear and missile threats, the defense ministry said....

South Korea and the US have agreed to deploy a high-tech antiballistic-missile interception system in the Northeast Asian country to upgrade the allies' defense against North Korea's increasing nuclear and missile threats.

The decision came after five months of negotiations between Seoul and Washington over whether to deploy the Terminal High Altitude Area Defense (THAAD) system, an advanced air defense shield that makes up the US' mainland missile defense system.

..."South Korea and the US have made the joint decision to deploy the THAAD system with US Forces Korea as part of defensive action to guarantee the security of the Republic of Korea and our people from North Korea's nuclear weapons, weapons of mass destruction and ballistic missile threats," the Ministry of National Defense's deputy minister for policy Yoo Jeh-seung said in a press conference...Gen. Thomas Vandal at a news conference in Seoul on July 8, 2016. The two allies agreed to deploy the THAAD defense system in South Korea. (Yonhap). The deployment is also designed to secure the military power of the bilateral alliance, he said.

The allies' joint working group is currently in the final stages of proposing a site for the THAAD deployment to the countries' defense chiefs, Yoo said... When THAAD is deployed, it will not target countries other than North Korea and be exclusively used to deal with the communist country's nuclear and missile threats, Yoo said, brushing off China's protests raised over the deployment move.

"The deployment of THAAD will contribute to (the buildup of) a multi-layer missile defense and strengthen the South Korea-US alliance's missile defense capabilities against North Korea's missile intimidation," the official also said.

Joining the announcement, USFK Chief of Staff Lt. Gen. Thomas Vandal said ... decision is a critical one in advancing the capabilities of the Republic of Korea and US alliance as we work together to defend our alliance's military forces and people of South Korea from growing North Korean ballistic missile threats."

The deployment of THAAD will contribute to (the buildup of) a multi-layer missile defense and strengthen the South Korea-US alliance's missile defense capabilities against North Korea's missile intimidation.

...The allies plan to announce the site for deployment "within a couple of weeks," Yoo said. But the specific location will not be made public due to operational secrets, he added. Currently, about four counties are being cited as possible deployment sites including Pyeongtaek, south of Seoul, where USFK's new headquarters are based; Wonju, a eastern city close to the inter-Korean border; as well as the southern town of Chilgok.

"The allies aim to be able to start actually operating THAAD in South Korea at least by the end of 2017, but we will make efforts to complete

deployment before the target period," Yoo said.

Source: http://english.yonhapnews.co.kr/, 08 July 2016.

BALLISTIC MISSILE DEFENCE

INDIA-ISRAEL

The missile has been made by India's DRDO, in collaboration with the Israeli Administration for the Development of Weapons and Technological Infrastructure, as revealed by the defense officials. The missile designed to level any airborne threat including aircraft and helicopters was successfully test launched from a mobile launcher in the Integrated Test Range at Chandipur, Balasore ...

A new production facility to deliver 100 long and mid-range surface-to-air ballistic missiles at M/s Bharat Dynamics Limited, India has been established. The missile was initially proposed to be tested yesterday but, was rescheduled in the last moment for today.

Source: http://www.pc-tablet.co.in/, 30 June 2016.

NUCLEAR ENERGY

INDIA

First Criticality for Indian Reactor

Construction of the Russian-designed VVER-1000 reactor was completed at the Tamil Nadu site in July 2015, and it was loaded with its first fuel in May 2016. Following the completion of safety tests, NPCIL began the process of approaching criticality on 8 July 2016 by diluting neutron-absorbing boric acid in the primary coolant water. A controlled self-sustaining nuclear fission chain reaction - or criticality - was attained on 10 July 2016...

The reactor's power will now be increased in stages, in line with procedural and regulatory requirements. It will be synchronized to the grid when output reaches about 400 MWe. Kudankulam 2 is the second of two AES-92 VVER-1000 reactors supplied by Russia's Atomstroyexport under a Russian-financed contract. The two Kudankulam units have been built by NPCIL and also commissioned and operated by NPCIL under IAEA safeguards, with supervision from Russian specialists. Enriched uranium fuel for the entire life of the plant is to be supplied by Russia.

Construction of the Kudankulam units began in 2002. Kudankulam 1 achieved first criticality in mid-2013 and entered commercial operation in December 2014. The Kudankulam units are India's first pressurized water reactors to enter operation and are the largest reactors in the country. With the exception of two boiling water reactors at Tarapur, the rest of India's operating nuclear fleet are pressurized heavy water reactors (PHWR).

...Two further AES-92 VVER-1000s are planned for construction at Kudankulam, with longer-term plans for up to 12 Russian reactors....

Source: World Nuclear News, 11July 2016.

India Poised to Ramp up Nuclear Energy Sector: Union Minister Piyush Goyal

India is looking at ramping up nuclear energy production in a big way with renewed thrust on clean energy resources, Union Minister Piyush Goyal said...Goyal said the country is looking at "ramping up its clean energy source significantly" without compromising on safety of people and the government would ensure that power from this source is affordable.

"We will never compromise on safety of our people... we will ensure power is affordable... with these two caveats we are very keen to promote nuclear energy in a big way. We are able to get uranium supplies," the minister said. He added the country is close to setting a technology framework and is very close to getting into the nuclear suppliers group...Goyal said the country has significant resources of thorium in the southern coastline of Tamil Nadu but the technology is still not tested and tried.

He expressed hope that the technology would soon be proven so that the indigenous raw

material, important for country's energy security could be utilised fully...

Source: http://indianexpress.com/,07 July 2016.

India Rules Out GE Reactors Lacking Working Plant Elsewhere

India Won't Buy GE Hitachi nuclear energy's atomic reactors that haven't been used in nuclear power plants before, the country's top atomic-energy bureaucrat said. "Right now they have offered us reactors that do not have a reference plant," Sekhar Basu, secretary at India's DAE, said in a phone interview referring to the need for an operating example. "We will not buy a reactor that doesn't have a reference plant."GE Hitachi has signed an accord for supplying reactors for an atomic power plant at Kovvada in India's southern state of Andhra Pradesh...

Strong international ties among nuclear industry players will remain, both on the part of major contractors and the vast international supply chain. Despite voices on both sides of the English Channel that are hoping for a complete breakdown in development of the Hinkley Point project.

Liability Risk

India's reservations come nine months after General Electric Chairman Jeffrey Immelt said his company won't risk building a nuclear plant in India, citing the nation's nuclear liability law, which exposes equipment suppliers to claims and litigation if there is an accident. The law has stood in the way of India's nuclear expansion plans, as reactor suppliers including GE and Westinghouse Electric Co. weigh risks of doing business in the country.

"GE Hitachi continues to have a strong interest in providing our technology to India for the eventual construction of multiple" economic simplified boiling-water reactors, or ESBWRs, the company said in an e-mailed statement. "We believe the path forward requires a sustainable regulatory environment, which would include a nuclear-liability law that channels liability to plant operators consistent with global best practices."

India plans to expand its nuclear generation capacity 10-fold by 2032, for which it needs larger, foreign-designed reactors. Earlier this year, the nation ratified the Convention on Supplementary Compensation for Nuclear Damage, or the CSC, a global treaty on nuclear liability, responding to demands from the global reactor suppliers.

First Approval

Westinghouse is building four AP1000 reactors each in the US and China, while EDF is installing EPR reactors at plants in France, Finland and China. In May 2015, the US Nuclear Regulatory Commission approved construction of the first plant to use GE Hitachi's ESBWR design...Basu said...EDF has a pact to build a plant in the western state of Maharashtra, while the Russian-designed reactors are being used for a plant in the southern state of Tamil Nadu

Source: http://www.bloomberg.com/, 29 June 2016.

UK

Brexit Implications for UK Nuclear Power

When the UK, EU's second-largest economy, voted to leave the union on 23 June 2016, reactions were swift and sometimes unexpected, but what does the Brexit vote mean for the nuclear power industry, which is an increasingly global one? Based on comments made at this week's World Nuclear Exhibition (WNE) outside Paris, the most honest assessment is that it is too soon to tell.

For one thing, even though the vote was to leave the EU, the formal process of exiting the EU has not begun and may not begin, if the buyer's remorse expressed even by some in favor of the exit leads to some form of backpedaling on the move. Whether or not the breakup is finalized, strong international ties among nuclear industry players will remain, both on the part of major contractors and the vast international supply chain. Despite voices on both sides of the English Channel that

are hoping for a complete breakdown in development of the Hinkley Point project, those within the industry appear committed to seeing that it moves forward.

At WNE, both representatives of 85% state-owned EDF, the French nuclear operator that has plans to build the UK's Hinkley Point C plant in the south of England, and Emmanuel Macron, the French minister for the economy, industry, and the digital sector, assured attendees that EDF and the French government remain committed to the project.

In October last year 2015, EDF and China General Nuclear Power Corp. signed a strategic investment agreement with EDF to hold a 66.5% share. However, a final investment decision by EDF has yet to be made and is expected soon. Though most of the attention has been given to Hinkley Point, the UK has a second new build project planned by NuGen, a Toshiba and ENGIE joint venture. That project aims to use the Westinghouse AP1000 at a 3,800-MW plant near the Sellafield site to be on the grid by 2020. NuGen CEO Tom Samson underscored on Tuesday at WNE that UK policy supports nuclear and that funding support through contracts for difference make new builds easier than in some countries.

Brexit may actually have more of an impact on the multinational ITER fusion project, being developed in France. Though the consequences of the Brexit vote are not yet clear, should the UK actually break from the EU, its companies and people would no longer be eligible to work on the massive fusion project.

Brexit may actually have more of an impact on the multinational ITER fusion project, being developed in France. Though the consequences of the Brexit vote are not yet clear, should the UK actually break from the EU, its companies and people would no longer be eligible to work on the massive fusion project,... At the World Nuclear Exhibition, ITER Office Deputy Head, Central Integration Office, Guenter Janeschitz noted that if the UK finalizes an exit from the European Union, it would have major consequences for the multinational fusion project....

Source: http://www.powermag.com/, 29 June 2016.

NUCLEAR COOPERATION

CHINA-ARGENTINA

China and Argentina Reaffirm Reactor Agreement

China and Argentina have signed a memorandum of understanding (MOU) reaffirming their plans to construct two new nuclear power reactors in the Latin American country with financing from Chinese banks. Construction of Argentina's fourth reactor is to start early next year in 2017.

Last November (2015), Argentina signed deals with China for the construction of its fourth and fifth nuclear power plants: a third CANDU pressurized heavy water reactor (PHWR) at the Atucha site and a pressurized water reactor (PWR) at an unspecified site. The projects are worth around $15 billion and China will contribute 85% of the required financing, according to a statement issued at that time by the Argentine president's office.

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An MOU affirming the November 2015 agreement - made under the previous government of then-president Cristina Fernandez - was signed in Beijing by Argentina's minister of energy and mining Juan José Aranguren and Nur Bekri, director of China's National Energy

Administration. A statement from the Argentine ministry said, "According to the document, both Argentina and China commit to speed up negotiations to begin construction of the first of the two agreed units for the first quarter of 2017 and the second by 2019."

The two ministers signed the memorandum of understanding regarding the mutual development of nuclear technologies and cooperation between Turkey and China.

...In July 2014, China and Argentina signed a new high-level agreement towards construction of a third pressurized heavy water reactor (PHWR) at the Atucha plant in Argentina. Through the agreement, China National Nuclear Corporation (CNNC) is to assist Nucleoeléctrica Argentina SA (NASA) by providing goods and services under long-term financing. That agreement was ratified in February 2015. The accord provides for NASA - holder of rights to Candu technology - to be designer, architect-engineer, builder and operator of the new reactor.

"China and Argentina, though a world apart, are in close nuclear cooperation," CNNC general manager Qian Zhimin was quoted as saying by the People's Daily. "The two countries share a tradition of friendship and both governments also attached much significance to nuclear cooperation."

The EDF, which took over the nuclear energy arm of Areva, the company which was initially supposed to build the reactors, will construct six reactors with a capacity of 1650 MW each at Jaitapur in Maharashtra. After completion, this will be one of the largest nuclear parks in the world.

Source: World Nuclear News, 01 July 2016.

CHINA-TURKEY

Turkey and China Sign Deal On Nuclear Cooperation

Energy and Natural Resources Minister Berat Albayrak and Chinese National Energy Administration Director Nur Bekri signed a memorandum of understanding regarding the cooperation between the two countries in the field of nuclear power, yesterday. The memorandum covers the mutual development of the nuclear technologies and cooperation between Turkey and China.

Arriving China in the morning with local time for the G20 Energy Ministers Meeting in Beijing, Minister Albayrak also attended the opening ceremony. After the family photo shooting and opening session, Albayrak held a series of bilateral meetings...

...Albayrak held his last meeting with Chinese National Energy Administration Director Nur Bekri. During this meeting, the two ministers signed the memorandum of understanding regarding the mutual development of nuclear technologies and cooperation between Turkey and China. It was also indicated that the two ministers agreed upon reflecting the strong cooperation in the field of energy to the other fields.

...At his first stop, Albayrak visited the Wind Power Center in Beijing, and meet the world's most important wind power firms, later followed by meetings with the representatives of the China Development Bank and several finance institutions. Later he met Bekri, and discussed the collaboration between Turkey and China regarding the energy sector as he did in his latest visit as well. As the last stop of his Beijing program, Albayrak met the giants of the Chinese coal mining sector. Another important agenda topic for the China visit was again nuclear power. Albayrak later visited the city of Weihai and examined the Chinese national State Nuclear Power Technology Corporation's CAP-100 Nuclear Plant (a so-called "third-generation" Nuclear Plant). The last stop of Albayrak's four-day visit was Shanghai where he visited Shanghai Nuclear Engineering Research and Design Institute, and met the world's leading firms operating in the fields of thermal power plants and renewable energy....

Source: http://www.dailysabah.com/, 29 June 2016.

FRANCE-INDIA

France Submits Fresh Plan for Six Nuclear Plants in Jaitapur

France has given a fresh techno-commercial proposal for building six atomic reactors in Jaitapur even as it again raised concerns over India's civil liability law and sought "same level of protection" which are available for companies at the international level.

An Electricite de France (EDF) team, comprising senior officials, is currently holding talks with the MEA and NPCIL on setting up of these plants. We have raised our concerns over the liability issue. France is a party to Vienna Convention on Civil Liability for Nuclear Damage. We want similar binding conditions in the Jaitapur contract.

France has given a fresh techno-commercial proposal for building six atomic reactors in Jaitapur.

...The proposal includes negotiating with India for six reactors as against two, which was the case earlier. This would help bring down the cost. It also includes a proposal for localisation of technology to make the project cost effective. The EDF has raised concern over various clauses dealing with the Right to Recourse under the Civil Liability for Nuclear Damage (CLND) Act 2010. Though the French side still has some concerns over the impact of India's liability law, they acknowledged the Indian government has taken several steps to assuage those through initiatives like formation of Nuclear Insurance Pool.

In February 2016, in a significant move aimed at putting an end to the contentious liability issue and assuage suppliers' concerns, India ratified the Convention on Supplementary Compensation for Nuclear Damage. The move will help establish a worldwide liability regime of enhanced compensation for nuclear damages. The EDF, which took over the nuclear energy arm of Areva, the company which was initially supposed to build the reactors, will construct six reactors with a capacity of 1650 MW each at Jaitapur in Maharashtra. After completion, this will be one of the largest nuclear parks in the world.

The EDF, which took over the nuclear energy arm of Areva, the company which was initially supposed to build the reactors, will construct six reactors with a capacity of 1650 MW each at Jaitapur in Maharashtra. After completion, this will be one of the largest nuclear parks in the world.

During French President Francois Hollande's visit to India earlier this year 2016, India and France had drawn up a road map for concluding techno-commercial negotiations for the Jaitapur project by the end of 2016. Accordingly, an MOU was signed by EDF and the NPCIL.

Source: http://economictimes.indiatimes.com/, 07 July 2016.

USA-JORDAN

Jordan's Nuclear Chief Says Kingdom Keen on Deal with US

Jordan is eager to reach a nuclear cooperation deal with the US after a long impasse over uranium enrichment and both sides appear ready to compromise, the kingdom's nuclear chief said.

An agreement would give Jordan access to US technology, including small modular reactors that could fit well into the country's fledgling nuclear energy programme, said Khaled Toukan, chairman of the Jordan Atomic Energy Commission. Talks with the United States stalled after Jordan refused to drop the right to pursue future uranium enrichment capabilities, which can have peaceful and military uses. As part of non-proliferation efforts, the US insisted that Jordan forgo that right, as the UAE previously did in a deal with Washington in 2009.

...For now, the centrepiece of Jordan's programme is a US$10 billion (36.7bn) deal with Russia for two larger reactors, to be built by 2025. Mr Toukan acknowledged that financing was not yet decided and that Jordan was still looking for a third partner. The probability of the two reactors being built is "70 to 75 ... it is not 90 per cent,"" he said.

... "It is important for us to have the US on board," Mr Toukan said. "Even if we build the Russian

reactors, you might have small modular reactors for water desalination in the future." Jordan launched its nuclear programme almost a decade ago to address the country's worsening energy woes. Jordan has to import fossil fuels for 98 per cent of its electricity generation. With demand contantly rising, the country is buckling under growing debt from energy imports.

Jordan needs a mix of alternatives, including nuclear energy, Mr Toukan said. Domestic critics say Jordan rushed into a risky programme it cannot afford at the expense of developing solar and wind energy and that Mr Toukan's commission lacks transparency and oversight...

It appears that the increased pace of testing of North Korea's Musudan missile is not limited to that program. It is quite possible that there will be more frequent SLBM tests and failures as well. Even with frequent testing, North Korea's SLBM program still faces significant technical challenges and will likely require several years to deliver an operational system.

...In its report, to be published later this July 2016, the panel said Jordan is on a "well-planned path" to acquiring nuclear energy, including training local scientists at a domestic research reactor. The panel said Jordan could do more to bring the public on board and should get more international experts involved. Financing of the two power reactors appears "somewhat nebulous" and the 2025 deadline for completing two reactors is "overly optimistic", the report said. Meanwhile, revived nuclear talks with the US could open the door to alternatives, such as the smaller reactors. Mr Toukan suggested that there was room for compromise on the uranium enrichment issue.

"We are trying to find an intelligent way in the middle to more or less give the US assurance about non-proliferation, safeguards and so on, but at the same time not relinquishing rights under international treaties," he said.

Source: http://www.thenational.ae/, 04 July 2016.

NUCLEAR PROLIFERATION

NORTH-KOREA

North Korea Still Faces Significant Challenges in Developing a Sea-Launched Missile: Expert

North Korea conducted what appeared to be another test of a submarine-launched ballistic missile (SLBM) off the east coast ..., according to South Korea's Joint Chiefs of Staff and a report by Seoul's Yonhap News Agency. The missile was reportedly fired from Sinpo, South Hamgyong Province, at around 11:30 a.m. KST. The test came one day after the US and South Korea announced an agreement on the deployment of the Terminal High Altitude Area Defense (THAAD) system. An operational sea-launched missile, because it could be launched from different areas around the peninsula, would be one approach to overcome such a defense.

"Little information is available about North Korea's submarine-launched ballistic missile (SLBM) test... beyond that the missile launched successfully and then broke up or exploded at about ten kilometers altitude," said John Schilling, an Aerospace Corporation Satellite and Launch Vehicle Propulsion Systems Specialist, and frequent contributor to 38 North, a project by the US-Korea Institute at Johns Hopkins SAIS. ...it appears that the increased pace of testing of North Korea's Musudan missile is not limited to that program. It is quite possible that there will be more frequent SLBM tests and failures as well. Even with frequent testing, North Korea's SLBM program still faces significant technical challenges and will likely require several years to deliver an operational system."

Sinpo Shipyard is located on the east coast, and is the primary manufacturing facility for North Korea's submarines. An analysis of satellite imagery in January 2016 indicated that the shipyard was undergoing upgrades in preparation for a significant naval construction program. A report in May 2016 showed continued progress, and two weeks later on 17 May 2016 , camouflage netting was spotted on the deck of a submarine, ostensibly meant to conceal ongoing development at the shipyard.

Source: http://38north.org/, 09 July 2016.

NUCLEAR NON PROLIFERATION

CHINA-NORTH KOREA

China's Xi says Beijing will not recognize N. Korea's nuclear policy

Chinese President Xi Jinping told South Korean Prime Minister Hwang Kyo-ahn the he will not recognize North Korea's policy of simultaneously pursuing nuclear advance and economic development... Xi also repeated China's stance that Beijing "firmly opposes" North Korea's development of nuclear weapons and is faithfully implementing UN sanctions against the North's nuclear and missile programs. Hwang told Xi that the implementation of UN sanctions and other pressures on North Korea must continue for North Korea to "change calculations," the official said...

In the wake of North Korea's fourth nuclear test and the launch of a long-range rocket earlier this year, South Korea and the US started formal talks on deploying a THAAD battery to South Korea to better defend Seoul from Pyongyang's growing threats. For South Korea, the decision to adopt the US missile system was based on its national security interests to enhance its defense posture against North Korea's advances in nuclear and missile programs.

Russia and China have long voiced opposition to the deployment of a THAAD battery to South Korea, claiming that the US missile shield may undermine the strategic balance in the region. South Korea and the US have dismissed the concerns, saying the THAAD system is defensive in nature and would only target North Korea.

Source: http://english.yonhapnews.co.kr/, 29 June 2016.

NUCLEAR TERRORISM

ARMENIA

Easy Target for Terrorists: Armenia's Metsamor Nuclear Plant

...The recent ISIS attack on Istanbul's Ataturk Airport hints at an alarming trend in which highly strategic areas are increasingly being targeted by international terrorist groups. A similar attack had taken place at Belgium's Zaventem Airport a few months before, which revealed that ISIS may have been planning an operation at Belgian atomic plant. While nuclear terrorism was a remote threat during the 9/11 attacks, with al-Qaeda originally wanting to target nuclear power facilities, it is becoming a dangerously feasible possibility that ISIS followers could launch a successful strike.

One such potential target finds itself at the very borders of the EU: the Metsamor nuclear power plant, in Armenia. The dangers it incurs are multiple: The lack of a cooling mechanism makes the outdated nuclear centre an easy target; the continuous smuggling of radioactive material by jihadists increases the risk of producing a dirty bomb; the uncontrolled zone of the Armenian-occupied territories of Nagorno-Karabakh are used to dump radioactive waste, which could leak or be dispersed as a result of terrorist action.

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The big concern is that the plant, built in 1976 with old Soviet technology similar to that of Chernobyl, in a seismically active area, has no cooling mechanism or containment building to prevent radiation from escaping during an accident. Described by the EU as 'the oldest and least reliable' reactor and referred as to the 'world's most dangerous' nuclear power plant by National Geographic, the facility was closed following an earthquake in 1988, only to be reopened during the Nagorno-Karabakh War. Until then, the relaunch of a shuttered nuclear station was unprecedented.

On numerous occasions, the EU has called for the 'earliest possible closure' of the nuclear centre, which completed its life span in 2010. The 2012 Country Progress Report for Armenia under the ENP Programme highlighted that the facility 'cannot be upgraded to meet the internationally recognized nuclear safety standard'. Yet, Armenia refused the EU's offer of €200 million to finance Metsamor's closure in order to avoid energy

shortages, as the power plant accounts for 40% of Armenia's electricity supplies. Moreover, it was recently announced that the operation of the plant would be extended until 2026, although Armenia was planning to decommission the centre in 2016. This would mean that it would continue to be a potential target for terrorists and to pose a threat for the South Caucasus for another 10 years.

The fact that ISIS seeks to find supplies in order to obtain enriched uranium or to produce dirty bombs from radioactive waste or byproducts also prompts worries. It is increasingly reported that uranium and other radioactive material is being smuggled from Armenia because of the lack of control. In April 2016, alarm bells were ringing, when Armenian and Georgian smugglers were arrested for attempting to sell $200 million worth of Uranium-238.

Last but not least, the nuclear waste in the uncontrolled zone of Nagorno-Karabakh and its seven surrounding regions, occupied by Armenian military forces, causes serious danger for the South Caucasus region and beyond. It is estimated that there are 29 radiation centres in the occupied territories, where radioactive waste from Metsamor nuclear power station is being buried. Apart from its disastrous effects for the environment, their leakage or dispersal by terrorist action would be devastating not only for Armenia, but for the entire region.

During the Nuclear Security Summit at the end of March 2016, more than 50 world leaders gathered in Washington in order to reduce the menace of dangerous nuclear material falling into the wrong hands but they failed to deliver tangible solutions for the South Caucasus region, which is in close proximity to terrorist groups in the Middle East.

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The EU took timely action to ensure the dismantlement of the nuclear installations in Bulgaria and Slovakia before these two countries joined the Union. Similar action is needed in the European neighbourhood to stop the time bomb called Metsamor, which constitutes an easy target for ISIS militants. The region could not afford a second Chernobyl by non-state actors. Hence, the EU must take immediate measures to eliminate the risk that such a strategically sensitive and dangerous facility falls into the wrong hands.

Source: Eli Hadzhieva, http://www.euractiv.com/ , 07 July 2016.

NUCLEAR SAFETY

BRAZIL

Brazil Police Arrests Nine Over Corruption At Nuclear Plant

Brazil's federal police ...said it served nine arrest warrants in two states as part of a corruption investigation into a nuclear power plant in Rio de Janeiro.

Police did not disclose the names of the suspects. The probe into Eletronuclear, the nuclear power subsidiary of state-run electric utility Eletrobras, is an outgrowth of a corruption investigation over kickbacks and price-fixing at state-run oil company Petroleo Brasileiro SA, police said.

In a statement, police said engineering companies colluded to overcharge Eletronuclear for the construction of the Angra 3 plant near Rio de Janeiro. Angra 3 is being built by many of the same firms whose executives are on trial or in jail on charges of forming a cartel that overcharged Petrobras for work and used the excess funds to bribe executives and politicians. Eletronuclear expects Angra 3 to start operating in December 2018, with capacity to generate up to 1,405 megawatts.

Source: http://news.trust.org/, 06 July 2016.

JAPAN

Kagoshima's New Governor Vows to Halt Sendai Nuclear Plant for Safety Checks

Incoming Kagoshima Gov. Satoshi Mitazono says he plans to ask Kyushu Electric Power Co. to suspend operation of the Sendai nuclear power plant for safety checks. ...Mitazono said he will make the request to the utility at a yet to be decided date to examine the effects of powerful earthquakes that hit nearby Kumamoto and Oita prefectures ....

The latest proposal is for a dump in the spectacular Flinders Ranges, 400 km north of Adelaide in South Australia, on the land of the Adnyamathanha Traditional Owners.

The former TV commentator was elected ... as governor of the only prefecture in Japan with an operating nuclear power plant. During campaigning, Mitazono pledged to halt its operation. "I will require Kyushu Electric to temporarily suspend the operation" for a survey of nearby faults and a review of evacuation plans to ensure safety, he said. "There are many citizens in this prefecture concerned about the nuclear power plant operating after the quakes in Kumamoto," he said.

Prefectural governors are not authorized to stop the operation of a nuclear reactor, but utilities require local consent to restart them. Backed by an anti-nuclear camp, Mitazono defeated incumbent Yuichiro Ito, who allowed two reactors at the Sendai complex to be reactivated last year in 2015.

Source: Japan Times, 14 July 2016.

NUCLEAR WASTE MANAGEMENT

AUSTRALIA

Radioactive Waste and the Nuclear War On Australia's Aboriginal People

Australia's nuclear industry has a shameful history of 'radioactive racism' that dates from the British bomb tests in the 1950s, writes Jim Green. The same attitudes persist today with plans to dump over half a million tonnes of high and intermediate level nuclear waste on Aboriginal land, and open new uranium mines. But now Aboriginal peoples and traditional land owners are fighting back!...From 1998-2004, the Australian federal government tried - but failed - to impose a national nuclear waste dump on Aboriginal land in South Australia. Then the government tried to impose a dump on Aboriginal land in the Northern Territory, but that also failed.

Now the government has embarked on its third attempt and once again it is trying to impose a dump on Aboriginal land despite clear opposition from Traditional Owners. The latest proposal is for a dump in the spectacular Flinders Ranges, 400 km north of Adelaide in South Australia, on the land of the Adnyamathanha Traditional Owners.

The government says that no group will have a right of veto, which is coded racism: it means that the dump may go ahead despite the government's acknowledgement that "almost all Indigenous community members surveyed are strongly opposed to the site continuing." The proposed dump site was nominated by former Liberal Party politician Grant Chapman but he has precious little connection to the land. Conversely, the land has been precious to Adnyamathanha Traditional Owners for millennia...

The whole area is Adnyamathanha land. It is Arngurla Yarta (spiritual land). The proposed dump site has springs. It also has ancient mound springs. It has countless thousands of Aboriginal artefects.

..."Adnyamathanha land in the Flinders Ranges has been short-listed for a national nuclear waste dump. The land was nominated by former Liberal Party Senator Grant Chapman. Adnyamathanha Traditional Owners weren't consulted. Even Traditional Owners who live next to the proposed dump site at Yappala Station weren't consulted..."The whole area is Adnyamathanha land. It is Arngurla Yarta (spiritual land). The proposed dump site has springs. It also has ancient mound springs. It has countless thousands of Aboriginal artefects...

...The battle over the proposed dump site in the Flinders Ranges will probably be resolved over the next 12 months. If the government fails in its third attempt to impose a dump against the wishes of Aboriginal Traditional Owners, we can only assume on past form that a fourth attempt will ensue.

Australia as the world's nuclear waste dump

Now Aboriginal people in South Australia face the imposition of a national nuclear waste dump as well as a plan to import 138,000 tonnes of high-level nuclear waste and 390,000 cubic metres of intermediate level waste for storage and disposal as a commercial venture.

The plan to turn South Australia into the world's nuclear waste dump has been met with near-unanimous opposition from Aboriginal people. The Aboriginal Congress of South Australia, comprising people from many Aboriginal groups across the state, endorsed the following resolution at an August 2015 meeting.

The plan is being driven by the South Australian government, which last year established a Royal Commission to provide a fig-leaf of independent supporting advice. The Royal Commissioner is a nuclear advocate and the majority of the members of the Expert Advisory Committee are strident nuclear advocates....

...Announcing the establishment of the Royal Commission in March 2015, South Australian Premier Jay Weatherill said: "We have a specific mandate to consult with Aboriginal communities and there are great sensitivities here. I mean we've had the use and abuse of the lands of the Maralinga Tjarutja people by the British when they tested their atomic weapons."...Aboriginal people repeatedly expressed frustration with the Royal Commission process. One example (of many) is the submission of the Anggumathanha Camp Law Mob (who are also fighting against the plan for a national nuclear waste dump on their land)...

The Labor Party has repeatedly driven or supported bipartisan attempts to impose nuclear waste dumps against the wishes of Aboriginal communities.

The plan to turn South Australia into the world's nuclear waste dump has been met with near-unanimous opposition from Aboriginal people. The Aboriginal Congress of South Australia, comprising people from many Aboriginal groups across the state, endorsed the following resolution at an August 2015 meeting...The Royal Commission acknowledged strong Aboriginal opposition to its nuclear waste proposal in its final report - but it treats that opposition not as a red light but as an obstacle to be circumvented...

Self-styled Aboriginal leaders

Just as self-styled 'pro-nuclear environmentalists' ignore the nuclear industry's systemic racism, so too do a number of self-styled Aboriginal 'leaders'. One such 'leader' is Warren Mundine. At various times he has been a member of the federal government's Indigenous Advisory Council, a National President of the Australian Labor Party, a Director of the Australian Uranium Association and co-convenor of the Association's 'Indigenous Dialogue Group' (which never initiated any dialogue with indigenous people).

Mundine... remains silent today as the Adnyamathanha Traditional Owners struggle to prevent the imposition of a nuclear waste dump on their land; and as one after another state government passes legislation weakening Aboriginal land rights and heritage protections at the behest of uranium mining companies.

Mundine says Australia has "a legal framework to negotiate equitably with the traditional owners on whose land many uranium deposits are found." In fact, only in the Northern Territory do Traditional Owners have any right of veto over mining - and that legislation has a clause specifically exempting the Ranger uranium mine from the Act!

Systemic Racism

Bill Shorten, leader of the federal Labor Party, recently said that "systemic racism is still far-too prevalent" in Australia. He should know - the Labor Party has repeatedly driven or supported bipartisan attempts to impose nuclear waste dumps against the wishes of Aboriginal communities.

And both the Labor Party and the Liberal/National Coalition believe that uranium mining is more

important than Aboriginal rights. One example concerns the 1982 South Australian Roxby Downs Indenture Act, which sets the legal framework for the operation of BHP Billiton's Olympic Dam uranium mine in SA. The Act was amended in 2011 but it retains exemptions from the South Australian Aboriginal Heritage Act. As things stand, BHP Billiton must partially comply with an old version of the Aboriginal Heritage Act - a version that was never proclaimed.

Traditional Owners were not even consulted about the 2011 amendments. The government's spokesperson in Parliament said: "BHP were satisfied with the current arrangements and insisted on the continuation of these arrangements, and the government did not consult further than that." That disgraceful performance illustrates a broader pattern. Aboriginal land rights and heritage protections are feeble at the best of times. But the legal rights and protections are repeatedly stripped away whenever they get in the way of nuclear or mining interests.

Thus the Olympic Dam mine is largely exempt from the South Australian Aboriginal Heritage Act. Subsection 40(6) of the Commonwealth's Aboriginal Land Rights Act exempts the Ranger uranium mine in the Northern Territory from the Act and thus removed the right of veto that Mirarr Traditional Owners would otherwise have enjoyed.

New South Wales legislation exempts uranium mines from provisions of the NSW Aboriginal Land Rights Act. The Western Australian government is in the process of gutting the WA Aboriginal Heritage Act 1972 at the behest of the mining industry. And on it goes:

• Native Title rights were extinguished with the stroke of a pen to seize land for a radioactive waste dump in South Australia;

• Aboriginal heritage laws and land rights were repeatedly overridden with the push to dump nuclear waste in the Northern Territory;

• and near-unanimous Aboriginal opposition to a nuclear waste dump in South Australia's Flinders Ranges is being ignored by the federal Liberal / National Coalition government (and the Labor Opposition) and the South Australian Labor government (and the Liberal Opposition). It wouldn't be an overstatement to say that the never-ending nuclear war against Australia's Aboriginal people amounts to cultural genocide. Indeed it would be a statement of the obvious.

Source: Dr Jim Green is the national nuclear campaigner with Friends of the Earth Australia and editor of the Nuclear Monitor newsletter, (Excerpted from) http://www.theecologist.org/, 01 July 2016.

Centre for Air Power Studies

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