



NUCLEAR SECURITY



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

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OPINION – Sitakanta Mishra

Parity Syndrome and Strategic Blunder Tango

Nuclear proliferation is a form of national suicide that Pakistan committed a few decades ago. It expects now to be forgiven, and treated as a normal nuclear state in response to modicum adjustments in its nuclear governance, in what will be a mockery of the nonproliferation order. If the normalization gospel is promoted, it would culminate in yet another tango of Pakistan's India-parity syndrome with strategic blunder on the part of the United States.

A Normal Nuclear Pakistan by Michael Krepon and Toby Dalton is another enthusiastic inquisition, after Mark Fitzpatrick's *Overcoming Pakistan's Nuclear Dangers*, on the possibility of making Pakistan a normal nuclear state, which is otherwise incorrigible, unless a miracle befalls. The authors rightly observe:

“The global nuclear order will not be strengthened by trying to accommodate a Pakistan that is greatly increasing its nuclear capabilities while rejecting the Comprehensive Test Ban Treaty and Fissile Material Cutoff Treaty. Nor will Pakistan become a normal, nuclear state by competing with India or by harboring groups that could spark a war with

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India.”

However, their inquiry on Pakistan's place in the global nuclear order, whether it will always be punished, and whether the nuclear mainstream will continue to elude Islamabad, is undertaken solely and erroneously within the Indo-Pak parity framework. Nuclear normalization cannot be exclusively for Pakistan, as North Korea, another proliferator of concern, has a similar threat perception and strategic scenario. Should we vouch for a normal nuclear North Korea along with Pakistan? Moreover, the rationale behind treating India as

a normal nuclear country must be distinguished from the argument in case of Pakistan. In India's case, the non-proliferation discourse had to be adjusted for "a responsible state with advanced nuclear technology", whereas Pakistan, a breeding ground for proliferation and jihadi terrorists, needs to reform itself to be accommodated in the regime.

As for revamping the administrative-security structure of nuclear assets in Pakistan, the gains are far from secure. Recently, the adviser to the Pakistani prime minister on foreign affairs, Sartaj Aziz, said that

although Pakistan has some influence over the Taliban, it has no control. George Perkovich rightly states that, in the larger context of deterrence stability, "a state cannot be a responsible possessor of nuclear weapons if it does not have sovereign control over organized perpetrators of international violence operating from its territory".

According to Krepon and Dalton, Pakistan's three main arguments are namely, i) "it deserves the same treatment and status in the global nuclear

order as India," ii) "the subcontinent will grow increasingly unstable if India and Pakistan are treated differently," and iii) "the global nuclear order will remain abnormal as long as Pakistan is excluded." This rhetoric is

infused with the parity syndrome that Pakistan is suffering since its inception. In no realistic judgment can Pakistan match India in any respect. Its futile attempts to compete with India during the last seven decades have in fact exhausted it. And the United States is to be partly blamed for fueling Pakistan's urge to compete with India. An India-type deal with Pakistan will certainly elevate Pakistan's India-parity syndrome to greater heights, and would be another strategic blunder by the United States. It is worth recalling that the

Reagan administration "deliberately overlooked Pakistan's clandestine nuclear activities" during the 1980s.

Hyphenating India and Pakistan during the last six decades did not help Pakistan emerge from the plunge, nor did it stabilize the subcontinent. The Indo-US partnership in the post-1998 phase gave a sense of de-hyphenation of India and Pakistan discourse in US strategic calculations. Now, the idea of normalizing Pakistan with an India-type nuclear deal would convey a sense of the United States' Janus-

faced South Asia policy. More importantly, it would convey the thriving confusion on the part of the United States as to how to fit emerging India in its scheme of the world order. As a result, though highly conjectural, India will be closer to the Chinese scheme of building an alternate world order through groupings and institutions like BRICS, SCO, New Development Bank, and Asian Infrastructure Investment Bank (AIIB). China has given indications of accommodating India by bestowing equal voting rights in institutions such as the New Development Bank, even though its financial contribution to these institutions is larger than others.

The argument that the global nuclear order will remain abnormal as long as (only) Pakistan is denied a pathway to nuclear normalcy is shortsighted. What about North Korea and Israel? Are they normal? Is the non-proliferation regime not abnormal without them?

The authors succinctly support normalization of Pakistan's nuclear status, provided that "the net result of mainstreaming would strengthen nonproliferation norms." This vindicates the argument that no one is assured whether the idea of normalizing Pakistan is worth attempting, and

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if Pakistan will deliver as desired. For that matter, who will determine if mainstreaming of Pakistan will, or will not, strengthen the regime? Should India not have a major say?

The five initiatives that the authors suggest Pakistan undertake are a mix of only declaratory policy and posture shifts, with no big bargains to justify the magnitude of risk they will pose to the non-proliferation regime in particular, and the world in general. Pakistan can keep doing whatever it is doing, while proclaiming its adherence to the conditions suggested for getting a deal. Only the suggestion to sign the CTBT without waiting for India would be hard for Pakistan to digest. Above all, if Pakistan accepts, the process and outcome of a deal on the basis of these conditions will never be equal with India's deal. The report suggests that Pakistan concede on its nuclear posture from "full spectrum" to "strategic" deterrence, but this will prove Pakistan's deterrence posture feeble. Lifting its veto on FMCT negotiations and stopping fissile material production will heighten Pakistan's fear of India's upper hand in fissile material stockpile. For Pakistan, a slight reduction or reversal of its nuclear posture vis-à-vis India would be an act of compromise. If it accepts all the conditions, the disparity between India and Pakistan will remain! There would be no end to Pakistan's quest for high-flying parity with India unless it is forced into a soft landing.

Source: Dr Mishra is Assistant Professor of International Relations at the Pandit Deendayal Petroleum University, Gandhinagar. <http://southasianvoices.org>, 05 November 2015.

OPINION – K.S. Parthasarathy

Atom Bomb: No Excess Cancer Death Among Survivors' Kids

This year we observed the 70th anniversary of A-bombing of Hiroshima and Nagasaki. In the 1950

Japanese national census, nearly 280,000 persons stated that they "had been exposed" in the two cities. The Radiation Effects Research Foundation (RERF) selected about 94,000 people to study the health effects of radiation.

One of the most notable among these projects is the study of the survivors' children. Quite contrary to popular perception, this study recently revealed that the children born to exposed parents did not suffer from excess cancer mortality or non-cancer deaths (*The Lancet Oncology*, September 15, 2015). Dr Eric J Grant and co-workers from the RERF looked at the birth records to identify children conceived after the atomic bombings and born in Hiroshima and Nagasaki. They also collected data from city offices which entertained applications

from pregnant women.

The study included 75,327 children of atomic bomb survivors in the two cities and unexposed controls, born between 1946 and 1984, and followed up to Dec 31, 2009. Researchers interviewed the parents directly or matched them to a master list of survivors to estimate the radiation exposure to their reproductive organs. This dose depended on distance of the individual from the hypocentre, shielding from such objects as buildings or hills and shielding from intervening tissues inside the body before radiation reached a particular organ.

The study covered 16,869 children with one or both parents within 2 km of the hypocentres. The researchers compared them with 18,450 children born to one or both parents resident in the city before and after the bombing but neither parent closer than 2.5 km to the hypocentres and 16,738 children who had both parents outside of the cities at the time of the bombing. Researchers matched the comparison groups by year of birth, sex, and city. They cautioned that the study is still underpowered. Ninety per cent of the cohort is still alive. Further follow up will enhance the statistical power of the study.

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What is the importance of the study? In an accompanying comment, David Brenner, Center for Radiological Research, Columbia University Medical Center, U.S. noted that in the first decade or so after the explosions, scientists focussed most of the concerns about long-term health on potential heritable genetic effects in subsequent generations. They relied on Dr. Herman Mueller's 1927 study which showed that radiation could induce heritable genetic effects in fruit fly.

"Since the 1950s, however, understanding of the relative importance of genetic and somatic radiation related effects has completely reversed: genetic effects are now considered only a small contributor to the overall detriment to health after radiation exposure", Brenner clarified. The conclusions from the latest study are consistent with the recent thinking on the topic.

Long-term studies of the health impact of radiation on the progeny of A-bomb survivors have not shown any scientific evidence for heritable genetic effects. Scientists assume that persons exposed to radiation may suffer from genetic effects as a matter of abundant caution as studies on fruit flies and mouse have shown that radiation can cause genetic effects. Though it is only an assumption, members of the public consider genetic effects of radiation as gospel truth — a wrong public perception prevails over a robust scientific fact. While agreeing with Dr Brenner's view that "absence of evidence is not evidence of absence", we need not lose sleep over the genetic effects of radiation as he rightly stated that "the risks must be small, otherwise they would have been

observed in the children of survivors".

Source: The writer is a former secretary, AERB. The Hindu, 19 October 2015.

OPINION – Jaideep Prabhu

Why India's Policy on N-Liability Reduces the Potential of the Civil Nuclear Deal with US

There has been a lot of discussion about civil nuclear liability in India over the past four years. The new law promulgated by the government in 2010 as one of the requirements for making the Indo-US nuclear deal operational two years earlier has proven to be controversial and been the subject of much scrutiny. Nuclear vendors, both foreign and

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domestic, have been dismayed at the unorthodox stipulations of India's Civil Liability for Nuclear Damage Act (CLNDA) and have generally stayed away from the country's potentially lucrative market, scuttling what had promised to be a nuclear renaissance in 2008. The most offending clause – and there are a couple – is that in case of an accident, nuclear operators shall have recourse to legal measures against their suppliers. This goes against nearly six decades of internationally accepted practice of making the operator solely responsible for all liabilities.

Proponents of India's new interpretation of nuclear liability have argued that the present insurance regime makes little sense and goes against the entire body of tort law. No other industrial insurance system allows suppliers immunity from legislation even in case of fault. Nuclear vendors have so far enjoyed a risk-free ride that serves as an indirect subsidy to the entire industry.

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Some of this support is, no doubt, built on the experience of the Union Carbide tragedy in Bhopal in 1984 that killed about 4,000 people and injured over 550,000 according to government estimates. The horrific accident, followed by bitter legal battles and what many see as insufficient compensation, has left many Indians wary of foreign corporations and their technology.

There are, of course, reasons for the unusual evolution of nuclear liability. They begin in 1954, when the US decided that the private sector may be invited into the nuclear energy market. Until then, there were no civilian nuclear reactors and all military facilities would be the responsibility of the government under various environmental and tort laws. Initially, there was reluctance to enter into the market because of the substantial risk involved and the difficulty of calculating insurance premiums for such low-probability yet high-risk events. The Price-Anderson Nuclear Industries Indemnity Act (1957) simplified these issues by investing all liability in the nuclear operator, capping compensation limits, and including a no-fault condition. This was seen as an equitable distribution of risk and benefit between supplier, operator, and consumer.

Economic channelling of liability to the operator was efficient; if multiple vendors all had to take out insurance against a potential nuclear accident, not only would it raise the price of components but also lock down larger financial assets. Furthermore, smaller suppliers would hesitate to take on risk that could be orders of magnitude more than the value of their contract. Similarly, the public is guaranteed compensation without delay because of a no-fault liability – if legal disputes arose over who is liable for damages, victims may spend years waiting for the courts to decide on the case. The operator is also afforded

some level of protection by capping damages. Thus, the benefits to each party in the nuclear concord are not insignificant. Though not a consideration when the Price-Anderson mechanism was formulated, it can additionally be argued today that nuclear power serves a public good by offering bountiful and reliable low-carbon energy.

Economic efficiency is not necessarily the prime consideration in policy-making but in the case of the nuclear industry, it might be the sensible yardstick. The notion is certainly not novel – governments frequently interfere in the market to prevent, break up, or regulate monopolies. For example, power distribution is a critical part of modern infrastructure; however, it would be foolish for companies to duplicate power lines simply to remain loyal to a strict textual reading

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of free market theory. Consequently, governments usually award a regulated monopoly to power distribution companies, thereby achieving economic efficiency and consumer protection as well as infrastructure development.

In India, of course, the traditional course of action has been for the government to have a powerful presence in business. However, recent legal amendments have opened the door to consider regulated monopolies in India. The Monopolies and Restrictive Trade Practices Act (1969) was replaced by the Competition Act (2002). In a significant departure from the former, the latter does not categorically disallow monopolies but concerns itself with merely the effect on the market in terms of consumer benefits and potential competitors. Clearly, Delhi has shown that it is not averse to economic efficiency if it is in the general interest of the public; the international nuclear liability norm is similarly another case of economic efficiency.

It is not that India's decision makers do not understand economics. The real fear for politicians is the astronomical cost of a nuclear accident, however rare. The insurance pool established by the Price-Anderson Act has grown to approximately \$14 billion today. This is by far the richest insurance pool available for awarding damages arising from a nuclear accident. Yet even the Price-Anderson nuclear insurance pool pales before some of the estimated costs of a nuclear cleanup. Fukushima, for example, where not a single death was caused by radiation, is still predicted to cost Japanese taxpayers around \$100 billion. Nuclear suppliers have deeper pockets than nuclear operators, particularly in India, where the only legal operator is an autonomous government agency. Leaning on the vendor, as the Indian legislation does, will help defray the cost that the state as the guarantor of last resort will have to ultimately pay.

This strategy has not borne fruit - all international vendors have shunned the Indian market despite its potential. The only exception, the Russian state-owned Rosatom, has renegotiated its contract and drastically hiked the price of their reactors. While the cost of the first two reactors at Kudankulam was Rs 17,270 crores, the third and fourth reactors will cost India Rs 39,747 crores – more than double the original price when economies of scale should have actually lowered the price. Moreover, it is unlikely that suppliers will budge from their positions for the global precedent that would set. The cost of this impasse hurts India not just in the price per reactor but also environmentally and economically. The public interest would be better

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served were Delhi to accede to the standard international interpretation of nuclear liability.

This is not to delegitimise India's fears of the cost of an improbable nuclear mishap. Rather, the solution must be found elsewhere. One possibility is to allow private sector entry into the nuclear power industry, allowing some of the costs of a nuclear accident to be borne by industry. In congruence with privatisation, a nuclear insurance pool may be set

up that all operators would contribute to depending upon the number of reactors they own. A greater amount of reactors will create a bigger pool and if India were to modestly aim at even half of its electricity to be derived from nuclear power, substantial funds could be accumulated. In addition, suppliers can be called upon to contribute to the pool as well in the form of a small annual licensing fee per reactor. As long as they are not exposed to liability, most suppliers should accept this modest proposal.

An unpopular but required measure is to also assess how many of the safety precautions are psychological and how many are truly needed. To take just one example, evacuating a zone 50 km in radius always sounds better

than clearing out an area 20 km in radius. However, how much is necessary is a decision scientists can make better than others; nuclear power plants already come with exclusion zones and evacuation beyond that should be dictated only by necessity.

If Delhi truly wanted to worry about liability, there are other aspects it can look at. For instance, its neighbours have shown increasing interest in

nuclear power; Pakistan is acquiring reactors from China, Bangladesh has inked an agreement with Russia, and Sri Lanka is considering joining the nuclear club as well. If an accident were to occur at any of these sites, the trans-boundary implications could be severe. None of these states are party to any of the international liability conventions yet and responsibility for any accident will fall on each state for its own domain. Expanding Indian's national nuclear pool to these countries is one solution but the sheer number of reactors India will have means that the Indian share in any compensation would be disproportionate. Nonetheless, this is an important conversation South Asia needs to have.

India's stubbornness on nuclear liability seems to have the purpose of punishing foreign vendors rather than achieving a pragmatic system. For all its interest in holding suppliers liable for damages, one wonders why Delhi has not asked coal and oil companies to compensate the over 100,000 deaths per annum and millions afflicted by respiratory illnesses. India is wrong on supplier liability and it takes political courage to walk back a mistake. But that is what this government must do.

Source: <http://www.firstpost.com/>, 12 November 2015.

OPINION – Ian Armstrong

Risks in Pakistan's Tactical Nuclear Weapons Policy

Recent clarifications in Pakistani nuclear policy confirmed speculations that Islamabad has an

alarmingly low threshold for tactical nuclear weapon deployment. Here are the geopolitical risks that emerge from Pakistan's now official position. Since Pakistan first began testing tactical

nuclear weapons in 2011, there have been long-standing ambiguities regarding the threshold at which Pakistan is willing to deploy its developing tactical arsenal.

While Islamabad has maintained a veil of mystery over most aspects of its nuclear program, former members of Pakistan's Foreign Service have asserted that these smaller nuclear weapons would be utilized

in the event of a conventional Indian military operation into Pakistani territory. This assertion – previously amounting to only informed speculation – has now been confirmed as Pakistan's formal stance. Foreshadowing what

would become an underwhelming US diplomatic venture in the final stretch of October 2015, Pakistani Foreign Secretary Aizaz Chaudhary stated that Pakistan would launch "low-yield nuclear weapons" if India staged an attack with conventional forces.

With this official tactical nuclear strategy in place, numerous and significant geopolitical risks surrounding Pakistan have now matured into much more concrete threats, bringing instability to South Asia in a multitude of degrees.

Increased Likelihood of Nuclear Escalation: Pakistan's intent on utilizing tactical nuclear weapons against invading Indian forces is a strategy based on the logic of quickly defeating such incursions without setting off a strategic nuclear war. In reality, however, Islamabad's declaration ultimately increases the odds that a

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full-scale nuclear war will develop. This fact stems from a handful of reasons. On one hand, Pakistan's assumption that the use of tactical nuclear weapons against Indian invaders is cleverly below the Indian nuclear threshold may well be erroneous.

India has avoided developing a tactical nuclear arsenal of its own, instead relying on the deterrence ability provided by significantly more powerful strategic nuclear weapons. While this resistance to arsenal diversification is welcomed in terms of overall nonproliferation goals, it also suggests a much higher reality of risk from the India-Pakistan perspective.

India may in fact be under the impression that a strategic arsenal can still deter tactical nuclear use from Pakistan in spite of its declaration otherwise. It may also be unwilling to take full-scale nuclear escalation off the table in the event that Pakistan brings its tactical missiles to the battlefield. In both possibilities, the risk of nuclear war is greatly increased. In addition, Pakistan's introduction of tactical nuclear weapons significantly increases the sensitivity of the national nuclear trigger. Given the short range logistics that tactical nuclear weapons entail as well as Pakistan's intentions to utilize them in a prompt response, these smaller missiles are likely to be kept in much higher operational readiness than Pakistan's strategic nuclear arsenal. By bringing tactical nuclear weapons into the calculus, Pakistan erodes many of the traditional barriers to nuclear deployment – undermining regional stability in the process.

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Heightened Risks of Proliferation: The logistics of Pakistan's tactical nuclear weapons also present risks involving nuclear proliferation – particularly in consideration of the various terrorist groups that operate in and around the country. The low-yield nuclear weapons now in Pakistani hands present proliferation risks due to three particular logistical qualities. First, the smaller yield involved with tactical nuclear weapons means that Pakistan's fissile material production – enough to produce roughly 20 strategic nuclear weapons a year – is channelled into a much greater number of devices.

With some Indian invasion plans reportedly involving the mobilization of 500,000 troops, Pakistan will be likely to dedicate a majority of its fissile material into these more numerous battlefield nuclear weapons. Greater numbers of nuclear weapons will subsequently bring greater risks of proliferation.

Second, the smaller size and more readily assembled nature of low-yield nuclear weapons also means that they will be easier to steal, conceal, and transport in comparison to the often much larger strategic variant. This enables nefarious non-state actors in Pakistan to feasibly plot the theft of a nuclear device in instances that would have previously not been possible due to sheer coordination difficulties.

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Third, Pakistan will need to disperse its tactical nuclear weapons into the hands of a much greater number of military personnel if they are to be effective and in line with the vision set out by Secretary Chaudhary. This increases the risk of proliferation by boosting the number of opportunities for non-state actors to

attack Pakistani personnel and steal a functioning nuclear device. It also creates more possibilities for nuclear weapons to fall into the hands of corrupt Pakistani military officials willing to sell them to both terrorist groups and rogue states seeking to make nuclear acquisitions.

Looking Ahead: No matter the angle taken, Pakistan's willingness to bring tactical nuclear weapons to the India-Pakistan border and officially lower its nuclear threshold stands as a new source of instability in a region where economic growth is often restrained by geopolitical tension. Looking towards the future, these risks appear to be compounded further by US-Pakistan nuclear talks that have reportedly stalled before even truly beginning. In the absence of such a deal, and the highly unlikely resolution of historical India-Pakistan tensions, the risks introduced by Pakistan's tactical nuclear weapons policy will remain of deep global concern.

Source: <http://globalriskinsights.com/>, 12 November 2014.

OPINION – Matt Gurney

Putin shouldn't Forget that NATO has a Nuclear Sabre to Rattle, Too

Russia plans to station state-of-the-art missiles to its westernmost Baltic exclave and deploy nuclear-capable bombers to Crimea as part of massive war games intended to showcase the nation's resurgent military power amid bitter tensions with the West over Ukraine. The president of the Russian Federation has announced that Russia is developing, and indeed, has already partially developed, missile systems capable of penetrating NATO's ballistic missile defences. Despite its recent return to global prominence, the Russian Armed Forces are not of the size and power they were during the days of the Soviet Union. Russia is reliant on its legacy nuclear forces to prop up its great power status in a way that the Soviets never were. This goes part of the way in explaining why the Russians have always felt threatened by the NATO defences. They could negate Russia's only trump card.

So Vladimir Putin is doing what he does, and

boasting that Russia has already found a way to bypass the defences. And, indeed, that's probably true. But it doesn't matter. NATO's defences were never intended to stop a major nuclear attack by Russia or China. Indeed, when they were being deployed, NATO-Russian relations were still pretty good. NATO's system remains today what it always was – a small, limited system, designed to shoot down a missile or small number of missiles launched by a relatively unsophisticated state using early generation ICBM technology.

That describes possible threats from Iran and North Korea. It does not describe Russia. It never has. It never will. A ballistic missile shield, like NATO's or the one the US operates on its own territory, isn't really about defending against a nuclear attack, per se. It's about giving a large, rational country options in how to deal with a smaller, potentially irrational regime.

Let's talk scenarios here for a minute. If North Korea, for instance, goes completely bonkers and nukes San Francisco, the president of the United States would probably be compelled to retaliate in kind – a proportional retaliation against a North Korean city. The military and public pressure to do anything less would be enormous, as would the concerns that failure to retaliate would invite further attacks. But if North Korea's missile is shot down, the president would have options. Sure, they could drop a bomb on North Korea and call it even. But they could also strike back against a military target, detonate a nuke high in the air or at sea, just to prove a point, or respond conventionally, or simply threaten to respond until North Korea made major concessions.

How would it really happen? No one knows. It's never happened before. But the key thing is this: saving San Francisco isn't the point, per se, so much as a perk. The real goal is keeping any such emergency getting so serious that nuclear retaliation is the only real option. A nuclear launch would be enormously provocative, but until the bomb actually detonates, there's room to manoeuvre.

Deterrence through being able to swiftly annihilate the other guy is the best, really only, system we

have But that strategy will never, ever work against Russia. It can't. Their arsenal is too big and too advanced. They don't just have a handful of ICBMs, they have hundreds. They have dozens of bombers

and a fleet of submarines capable of launching from close to the enemy coast. They have cruise missiles and nuclear artillery and a horrendous numbers of nuclear weapons. You don't stop that with a minimal US-NATO shield. The defence shield might knock down a few of the missiles, but so many others would get through that the point is moot. We'd all be screwed, anyway.

That leaves us with deterrence as the only real defence: Russia has its nukes, three NATO powers have theirs, and we hope no one is dumb enough to use them. The balance of terror isn't pretty, and Mutually Assured Destruction is no one's idea of a calmativ e, but it works.

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Putin knows this. As per usual, he's just boasting of Russia's might and technological sophistication. Fair enough. But recall that he's essentially bragging that

Russia can defeat a system that was specifically designed to pose no challenge to Russia. If that's an accomplishment he feels like trumpeting, that's up to him.

Related

The real concern with Russia, though, are reports that Russia is changing its nuclear doctrine to favour pre-emptive use of nuclear weapons. Not on a large scale, and not against enemy population centres. That would simply be insane. But as the continuing slump in global oil prices continues to bite deep into Russian coffers, the military doctrine concerning release protocols for

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escalate a conflict, by shocking the enemy into either abandoning their attack or returning to the bargaining table.

In a word, no. Any introduction of nuclear weapons to a conflict is inherently escalatory and would be incredibly dangerous. One can only hope that Russia's publication of their new nuclear-release conditions is intended more to alarm NATO, and make us worry that we're dealing with mad men, than it is an actual expression of legitimate policy. But in the meantime, for the first time in a long time, NATO is considering practicing nuclear warfare. That's our part of making sure deterrence works.

It's a weird time in geopolitics. The world's a scary place. But it's not a scary place because NATO has a missile shield, or Russia a plan to beat it. That's nothing new. What's new is the extent Russia is willing to push the West, and what's scary is how little clue the West seems

to have about how to respond.

Source: <http://news.nationalpost.com/>, 11 November 2015.

OPINION – *Japan Times*

Review Nuclear Fuel Cycle Program

The decision by nuclear power regulators to call for a change in the operator of Monju, the nation's sole prototype fast-breeder reactor, not only puts the fate of the trouble-prone project in question but raises serious doubts about the government's decades-old policy of seeking to establish a nuclear fuel cycle. The government should take

the upcoming recommendations from the Nuclear Regulation Authority (NRA) as a cue to rethink the controversial and effectively stalled policy itself.

Monju, on which the government spent ¥1 trillion to build, was once touted as a “dream” reactor that produces more plutonium than it consumes as fuel – a boon for resource-scarce Japan. It was also billed as a key component of the nuclear fuel cycle, in which spent fuel from nuclear power plants is reprocessed into plutonium-uranium MOX fuel to be reused at fast-breeder reactors and other types of nuclear reactors.

But the plant in Tsuruga, Fukui Prefecture, has been kept offline for most of the past two decades. After first reaching criticality in 1994 and starting to generate electricity the following year, Monju was shut down in December 1995

due to a sodium coolant leak and fire, and remained idled for more than 14 years until it briefly resumed operation in 2010 – when another accident forced it to be halted again. Subsequent revelations of sloppy safety checkups by its operator, the government-backed Japan Atomic Energy Agency, led the NRA to effectively order a ban on Monju’s operations.

Judging that no substantial improvement has since been made in the plant’s management, the NRA decided that it would shortly recommend to the education and science minister that the JAEA is unfit to run Monju and should be replaced by a new entity to operate the reactor. Unless a new operator is found within half a year, the NRA reportedly plans to urge the government to fundamentally review Monju’s management, including its possible decommissioning. Although the recommendation is not legally binding, it would effectively be difficult to resume the reactor’s operation unless the NRA is convinced by the science minister’s response.

Monju’s operator has been revamped and reorganized since it was shut down in the wake of the 1995 fire and associated problems, but the plant has primarily been run by officials carried over from the original operator, the Power Reactor

and Nuclear Fuel Development Corp., to deal with the special fast-breeder reactor technology – which most other countries have given up on commercializing due to technical hurdles and the massive costs involved. It is deemed difficult for the government to quickly find a new entity to operate the troubled plant, and the NRA’s recommendation may put the survival of the Monju project in doubt.

The troubles that have plagued Monju for most of its life are only part of the problems that confront the government policy to create a nuclear fuel cycle. The completion of a nuclear fuel reprocessing plant in Rokkasho, Aomori Prefecture, has been delayed for years due to a series of technical glitches and other problems, and its construction cost has already tripled to around ¥2 trillion.

The government says it will continue to pursue the establishment of the nuclear fuel cycle. However, the restart of idled reactors remains slow amid public safety concerns over nuclear power, and power companies are starting to decommission aging reactors under the new tighter standards.

As the prospect of commercialization of the fast-breeder technology appeared remote given Monju’s problems, the government has pushed for the use of MOX fuel – processed overseas and shipped back to Japan – at several light-water reactors at nuclear power plants to promote the use of plutonium extracted from spent fuel. But those plants were shut down along with all the others in the wake of the March 2011 triple meltdowns at Tokyo Electric Power Co.’s Fukushima No. 1 plant.

Since it came to power, the Abe administration has sought to put the idled nuclear reactors back online once they’ve cleared the NRA’s screening under a new set of safety standards, and the government says it will continue to pursue the establishment of the nuclear fuel cycle. However, the restart of idled reactors remains slow amid public safety concerns over nuclear power, and power companies are starting to decommission aging reactors under the new tighter standards.

The government needs to stop and consider whether it makes economic sense to keep up the costly nuclear fuel cycle program that supposedly makes the most of uranium resources if – as Prime Minister Shinzo Abe keeps saying – Japan is going

to reduce its reliance on nuclear power “as much as possible” to meet its energy needs. If the Rokkasho plant does go online and starts reprocessing spent fuel from power plants across Japan, the nation may end up with more plutonium in addition to the 44 tons that have already been stockpiled, at a time when many nuclear power plants, including the MOX-capable ones, remain shut down. This situation may raise international concern from the viewpoint of preventing the proliferation of nuclear materials.

The recommendation to review the long-dormant Monju project should give the government, the power industry and the public an opportunity to also reassess the wisdom of pursuing the establishment of a nuclear fuel cycle program.

Source: The Japan Times, 09 November 2015.

OPINION – Jayantha Dhanapala

Need for Dialogue Among Divides: A Pugwash Perspective

The recent Nagasaki Pugwash Conference coincided with many significant anniversaries in the history of global peace and security – on this occasion with strong links to the host country, Japan.

It was the 70th anniversary of the UN, which underpins the prevailing global system of peace and security with its Charter and the framework of norms and values it upholds; It was the 60th anniversary of the Pugwash bedrock document and surely one of the earliest formulations of the “Humanitarian Pledge” of today – the 1955 London Manifesto of the Pugwash founding fathers Albert Einstein and Bertrand Russell – one of whose co-signatories was Professor Hideki Yukawa, the Nobel Physics Laureate from Kyoto University, Japan; And it was the 20th anniversary of the award of the Nobel Peace Prize jointly to Pugwash and to one of its founders Sir Joseph Rotblat three months after the Pugwash Conference was held in Hiroshima in that year. Anniversaries are not merely sentimental

occasions. They are valuable opportunities for stocktaking – surveying the road traversed and preparing for the journey ahead.

On a more sombre note, it was the 70th anniversary year of the dropping of the plutonium bomb “Fat Man” by the USA on the city of Nagasaki on August 9, 1945 killing 35,000–40,000 people outright with an eventual total of 60,000–80,000 fatalities, colossal property damage and environmental pollution. While paying homage to

the memory of those who were killed, the survivors of both Nagasaki and Hiroshima – the “hibakusha” – must be recognized for their tireless efforts to ensure that never again will the world witness the use of a nuclear bomb.

On the morning the Conference opened, officials of the Pugwash

Conferences on Science and World Affairs presented gold-plated official copies of the Pugwash Nobel Peace Prize medal for display in the atomic bomb museums in Nagasaki and Hiroshima together with copies of the Nobel diploma reaffirming a continuing commitment to work actively for a world free of nuclear weapons.

Nuclear Disarmament: Together with the Bomb dropped on Hiroshima earlier, on 06 August 1945, we have grim reminders of the *raison d'être* of Pugwash and its origins in the Cold War years when the horror of a nuclear holocaust hung over our heads. That spectre, with almost 16,000 nuclear warheads being held today among nine nuclear weapon armed countries, remains perhaps even more ominous and immediate than ever before. Conflicts rage in various parts of the world with new anarchic non-state actors – some of them with medieval mindsets – seeking to acquire this most destructive and inhumane weapon ever invented.

Nuclear disarmament, therefore, remains a central task. The gulf between the two major nuclear weapon armed nations – the USA and Russian Federation who possess 93% of all the nuclear weapons in the world – has frozen progress in bilateral arms control and

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disarmament imperiling even the agreements reached in the past such as the INF treaty of 1987. The goal of a nuclear weapon free world in President Obama's Prague Speech of 2009 has now, alas, become a mirage. Only international civil society maintains pressure for a Nuclear Weapons Convention supported by the UN Secretary-General and His Holiness the Pope.

The Global Situation and the Thucydides Trap: In his book, *World Order*, published at the end of 2014, Dr. Henry Kissinger provided a historical analysis of a quest for a rule based global order. That quest has to be undertaken today in a world where in Kissinger's words: "Chaos threatens side by side with unprecedented interdependence; in the spread of weapons of mass destruction, the disintegration of states, the impact of environmental depredations, the persistence of genocidal practices and the spread of new technologies threatening to drive conflict beyond human control or comprehension."

Thus in today's world a rule based world order seems even more remote considering the diversity of emerging players and problems with no apparent centre of gravity. Even as the slowing down of the Chinese economy has its ripple effects globally proving how interconnected we all are, fatalistic predictions are made by commentators on the "Thucydides Trap" – referring to The History of the Peloponnesian War on the inevitability of war between the then established power Sparta and the aspiring power Athens – as if we are destined to repeat the mistakes of history.

The recent visit of President Xi Jinping to the UK and the entry of Russia in the battle against ISIS in Syria are two examples of the co-operation that is possible among the Great Powers in the interest of world peace and stability. Pugwashites, recalling the Russell-Einstein Manifesto, can never accept the inevitability of war.

In the face of the stark realities of the contemporary world situation a Pugwash perspective on world affairs, stressing Dialogue among Divides, and the common bond of humanity that binds us all, must be pursued

vigorously in traditional areas of activity and in the new areas that today's political, economic and technological developments have created – climate change, cyber security, terrorism, inequalities, the refugee crisis and other challenges. If Pugwash functions as a confederation of autonomous national groups interacting with each other at the regional level and with Pugwash International at the global level on specific initiatives its collective impact can be enhanced.

...Iran and 'Five plus One': One area where Pugwash's long-standing efforts finally bore fruit is with the conclusion of the JCPOA between Iran and the "Five plus One" on Iran's nuclear programme. Over the years Pugwash had worked patiently and painstakingly for this result through consultations and discreet meetings at times when such meetings were unthinkable and could have caused their participants some discomfiture if disclosed.

All who contributed to the final result deserve congratulations and good faith implementation of the JCPOA in all its aspects is what is needed now. As the Pugwash leadership stated in a Press release issued on July 14 this year: "The agreement strengthens the Non Proliferation Treaty, and contributes in important ways to security and stability in the Middle East region.

It shows that there is no alternative to negotiations based on mutual respect, reciprocity and recognition of each other's security concerns and legal rights. Attempting to "solve" the Iranian nuclear problem by military means would have had gravely negative consequences for the already troubled Middle East and for the nuclear non-proliferation regime.

What is important now is:

- a) to ensure constructive, businesslike and comprehensive implementation of the new agreement by all parties, while resisting attempts to derail it, and
- b) to take advantage of this diplomatic success to improve as much as possible political, diplomatic, and economic relations with Iran, and

to contribute to building trust and improving relations among all States in the Middle Eastern region.”

A direct sequel to JCPOA should be the dismantling of the NATO BMD system in Europe, which used, as its rationale, the threat from Iran thereby provoking the Russian Federation. We expect also to see Iran playing a constructive role in Middle East conflicts in the future and its invitation to Vienna for talks on Syria must be welcomed.

The NPT: While this aspect of non-proliferation was a success, 45 years after the entry into force of NPT and 20 years after the Treaty was extended under my Presidency by the adoption, without a vote, of a package of Three Decision and a Resolution on the Middle East, the 2015 NPT Review Conference failed to adopt a consensus final document.

Apart from persistent differences between the nuclear weapons states and non-nuclear weapon states, the failure to have any progress on achieving a Middle East Weapons of Mass Destruction Free Zone (MEWMDFFZ) and the refusal to acknowledge the burgeoning “Humanitarian Initiative” were the main reasons. Inevitably questions are raised on whether the NPT can survive with such failures on fundamental issues.

With all nuclear weapon states modernizing their nuclear weapons the prospects for nuclear disarmament are bleak and non-nuclear weapon states that depend on nuclear deterrence are equally culpable. There are rumours of a US-Pakistan civilian nuclear co-operation deal to parallel the US-India civilian nuclear co-operation agreement. Reports also claim that new US

nuclear weapons are to be based in Germany. Meanwhile eight states have still to ratify the CTBT for it to enter into force and convert the fragile de facto moratorium on testing into a permanent legal norm.

...Annual expenditure on nuclear weapons alone is estimated at \$105 billion or \$12 million per hour. This is scarcely what Article 26 of the UN Charter held up as an ideal “to promote the establishment and maintenance of international peace and security with the least diversion for armaments of the world’s human and economic

resources”. On economic development after the commendable progress achieved in meeting targets set out in the Millennium Development Goals (MDGs) in 2015 we have now to address the gaps. The proposed 17 Sustainable

Development Goals (SDGs) and 169 targets developed by the Open Working Group of the General Assembly on Sustainable Development Goals will be at the heart of the post-2015 development agenda. Coming from a developing country I see the transformational impact of these goals and the human dignity that comes with it.

The international community has a historic opportunity to finalize a meaningful, universal climate agreement in Paris in December 2015. In so doing, we will build a safer, healthier, more equitable world for present and future generations. Issuing its “Nagasaki Declaration” at the Conference the Pugwash Council said: “Human beings cannot survive without a strong sense of morality and ethics. It is crucially important that the experiences of the Hibakusha from Hiroshima, Nagasaki, and nuclear test sites around the world should be transferred to the next generation. As long as nuclear weapons and other weapons of mass

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destruction exist, their catastrophic consequences cannot be avoided. Recalling the Russell-Einstein Manifesto, sharing the voices of Nagasaki citizens and Hibakusha, standing in the middle of this city with its deep-rooted memory of devastation under the mushroom cloud, the Pugwash Council appeals again as human beings to human beings, "Remember your humanity, and forget the rest."

Source: Jayantha Dhanapala, a former UN Under-Secretary-General and former Sri Lankan Ambassador. This article is adapted from his Presidential Address at the Nagasaki Conference. <http://www.eurasiareview.com/>, 09 November 2015.

NUCLEAR STRATEGY

INDIA

India Successfully Test Fires its Nuclear Capable Agni IV Missile

India successfully test-fired its nuclear-capable strategic ballistic missile Agni-IV, capable of hitting a target at a distance of 4,000 km, from newly named Dr. APJ Abdul Kalam Island off the Odisha coast. The missile, which is about 20 metres tall and weighs 17 tons, was flight tested from the launch complex-4 of ITR at Abdul Kalam Island at about 9.45 am, defence sources said.

The launch was spearheaded by India's missile woman Ms. Tessy Thomas. This was the fifth trial of the Agni IV missile. This fire and forget missile is navigated using a jam proof ring laser gyroscope. According to the Ministry of Defence, it has "met all objectives as monitored and confirmed by the telemetry" and ships located in the down range monitored the "terminal event" which is the explosion of the dummy warhead. India already has battery of nuclear capable missile like, the Agni series, Prithvi series and the Submarine Launched Ballistic Missile.

Agni-IV missile is equipped with 5th generation onboard computer and distributed architecture. It

has the latest features to correct and guide itself for in-flight disturbances, they said. The most accurate ring laser gyro-based inertial navigation system (RINS) and supported by highly reliable redundant micro navigation system (MINGS), ensures the vehicle reaches the target within two-digit accuracy. The re-entry heat shield can withstand temperatures in the range of 4,000 degrees centigrade and makes sure the avionics function normally with inside temperature remaining less than 50 degrees centigrade. This was the fifth trial of Agni-IV missile. The last trial conducted by SFC of the army on December 2, 2014 was successful.

Source: <http://www.ndtv.com/>, 09 November 2015.

India's Nuclear Programme One of the Largest in Developing Nations': US Report

Stating that India has "one of the largest nuclear power programmes" among developing nations, a US-based think-tank has said that by the end of 2014 India had enough weapon-grade plutonium to possess an estimated stock of atomic weapons in the range of 75-125.

"An estimate of India's nuclear arsenal can be derived by considering its weapon-grade plutonium stock. The resulting estimate has a median of 138 nuclear weapons equivalent with a range of 110 to 175 weapons equivalent," a report released by Institute for Science and International Security said.

"However, the actual number of nuclear weapons India built from its stocks of weapon-grade plutonium must be less. When accounting for the amount of plutonium in the weapons production pipelines and in reserves, it is reasonable to assume that only about 70 per cent of the estimated stock of weapon-grade uranium is in nuclear weapons," the report said.

"Thus the predicted number of weapons made from its weapon-grade plutonium at the end of 2014 is about 97 with a range of 77-123. These

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values are rounded to 100 nuclear weapons with a range of 75-125 nuclear weapons," the report co-authored by David Albright and Serena Kelleher-Vergantini said.

The report estimated that India has made 100-200 kg of weapon-grade uranium for nuclear weapons. "Faced with a lack of information but evidence that India has produced HEU for nuclear weapons, it is assumed that India has made 100-200 kg of weapon-grade uranium for nuclear weapons. Of course, this estimate is highly uncertain," the report said. "It has a substantial stock of nuclear weapons made from weapon-grade plutonium, and perhaps some thermonuclear weapons that rely on both weapon-grade plutonium and weapon-grade uranium," the report said. Noting that an estimate of India's nuclear arsenal can be derived by considering its plutonium and highly enriched uranium stocks, the report said India separates plutonium produced primarily in a set of small, dedicated reactors and a smaller amount produced in nuclear power reactors.

"However, India also has a growing gas centrifuge programme capable of producing significant amounts of HEU mostly for naval reactor fuel and perhaps for nuclear weapons, including thermonuclear weapons," it said and alleged that India is not transparent about its fissile material stocks. The report estimates India's stocks of separated plutonium and highly enriched uranium as of the end of 2014. India's stockpiles of nuclear weapons however, is lesser than that of neighboring Pakistan, according to a recent report.

Source: <http://www.ndtv.com/>, 03 November 2015.

RUSSIA

Russia Reveals Secret Nuclear-Armed Drone Sub

A Russian document shown on state-run television confirmed that Moscow is developing a high-speed drone submarine capable of delivering a nuclear warhead. The secret weapon was shown on a document during Russian television broadcasts of President Vladimir Putin announcing plans for new strike weapons capable of defeating missile defenses. Disclosure of the nuclear-tipped, torpedo-shaped weapon was first reported by the Washington Free Beacon and has been dubbed Kanyon by the Pentagon.

...The document revealed that the Kanyon project is called "Ocean Multipurpose System 'Status-6'" and the developer was identified as the TsKB MT Rubin design bureau, which has built all current submarines in service with the Russian navy.

According to a translation of the document the goal of developing the submarine is "damaging the important components of the adversary's economy in a coastal area and inflicting unacceptable damage to a country's territory by creating areas of wide

radioactive contamination that would be unsuitable for military, economic, or other activity for long periods of time."

The document describes the weapon as a "self-propelled underwater craft" that can be delivered by two classes of submarines, Project 09852 or Project 09851 boats. The 09852 is a nuclear-

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The weapon as a "self-propelled underwater craft" that can be delivered by two classes of submarines, Project 09852 or Project 09851 boats. The 09852 is a nuclear-powered submarine based on what NATO calls the Oscar II-class attack submarine. The NATO code name for the 09851 could not be identified. The document appears to state that the Oscar-class submarine will be capable of carrying four drones and the other will be equipped with either three or six.

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Both submarines are relatively new and built in 2012 and 2014 respectively. Information from the document also appears to say that the drone submarine will travel at a depth of 3,280 feet and at a speed of more than 56 knots. The range is said to be 6,200 miles. A schematic drawing shows the drone submarine to be nuclear powered with a "reactor module." It will be controlled by command and control ships, support ships, a non-nuclear submarine "Sarov," and a surface ship used for rescue. Development plans call for a prototype to be built by 2019 and testing from 2019 to 2020.

US officials said several months ago that the drone submarine is expected to carry a very large megaton-class warhead that could be used to attack harbors and coastal regions. "This is an unmanned sub that will have a high-speed and long-distance capability," said one official, who noted that the drone development is years away from a prototype and testing. The Kanyon drone submarine is said to be a major worry of the US Navy, which is in charge of conducting anti-submarine warfare. ...

Source: <http://freebeacon.com/>, 11 November 2015.

Russia Working to Pierce 'Any Missile Shield': Putin

President Vladimir Putin pledged Russia would build weapons that could pierce any anti-missile shield as he accused the United States and its allies of looking to shackle Moscow's nuclear capabilities. "As we have repeatedly said, we will focus...on offensive systems capable of overcoming any anti-missile defence systems," Putin said at a government meeting on the defence industry in the Black Sea city of Sochi.

Russia has been locked in a feud for years over NATO plans to build a missile-defence system in Europe that it says is aimed against Iran but Moscow says is really directed at Russia. "References to the Iranian and North Korean nuclear missile threats are a cover-up," Putin said. The "true intentions" of the missile shield were aimed "at neutralising the strategic nuclear potential" of Russia, he said. In May, NATO condemned Russia's plans to deploy nuclear-capable missiles in Kaliningrad, a Russian region sandwiched between Lithuania and Poland, as well as its increased number of nuclear bomber flights. Russia's relations with the West reached their post-Cold War nadir over the Ukrainian crisis.

Source: <http://news.yahoo.com/>, 10 November 2015.

BALLISTIC MISSILE DEFENCE

IRAN

Russian S-300 Missiles to Arrive by End of Year

"We signed a contract with Russia. It is being done. We will acquire a large portion of the systems by the end of this 2015" says Iranian defense minister. Iran expects to receive the bulk of the S-300 air defense missile systems it ordered from Russia by the end of the year, Iranian Defense Minister Hossein Dehghan said in a televised interview.

...The announcement came two days after Rostec, Russia's state-run industrial corporation, announced that the deal to deliver the system had been finalized. "S-300, the air defense system, the contract has already been signed," Sergei Chemezov, the chief executive of Rostec was quoted as saying at the Dubai Airshow.

Dehghan added that Iranian troops were being trained in Russia to operate the surface-to-air missile systems. The S-300, first deployed by the Soviet Union in 1979 during the Cold War, has the capability to track and intercept multiple aircraft and ballistic missiles simultaneously at ranges of hundreds of kilometers. It is one of the most potent

air defense weapons in the world. Russia canceled a contract to deliver S-300s to Iran in 2010 under pressure from the West. But Russian President Vladimir Putin lifted that self-imposed ban in April 2015. If delivered to Iran, the system could provide a strong deterrent against any aerial attack on Iran's nuclear facilities.

PM Netanyahu has sought to persuade Putin not to supply Iran with the S-300.

During a telephone call in April 2015, Netanyahu told Putin that possession of the S-300 would "only make Iran more aggressive in the region and threaten security in the Middle East," according to a statement released by the PM's Office at the time....

Source: <http://www.israelhayom.com/>, 12 November 2015.

NUCLEAR ENERGY

INDIA

Nuclear-push: DAE to Indemnify Small Suppliers from Liability

In a bid to break the continuing stalemate on nuclear power projects, the Department of Atomic Energy is working to ensure that the smaller suppliers, or those supplying components to the main equipment vendors of a project, are indemnified against any potential liability claims. This comes in the backdrop of an equipment sourcing crunch faced by the state-owned project developer NPCIL for two of its under-construction indigenous reactor technology-based projects coming up in Gujarat and Rajasthan, with domestic equipment vendors and part-fabricators dragging their feet on supply of components for nuclear power plants citing liability concerns.

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Sekhar Basu, secretary, Department of Atomic Energy, said the contentious issue of right to recourse against suppliers could be resolved contractually. "We could put it in writing in the suppliers' contract that they have no such responsibility in case of an accident," Basu said on the sidelines of an event here. He also indicated that the Rs 1,500 crore India Nuclear Insurance Pool will be in place shortly.

"The right of recourse issues needs to be settled once and for all... Suppliers for Indian reactors make equipment as per our (design) specifications.... We will mention it in the contract that they will have no obligation (in case of any liability) as ultimately it is we (NPCIL) who are designing, fabricating, constructing, commissioning," Basu said at the Seventh Nuclear Energy Conclave here.

Source: <http://indianexpress.com/>, 04, November 2015.

RUSSIA

Russian Military Plans Mobile Nuclear Energy Plants in Arctic by 2020

Russia's Defense Ministry has contracted research work to develop mobile nuclear power plants designated for military installations in the Arctic. With the Soviet experience in mind, introduction of the first mobile NPP is likely to take place by 2020. Russian Defense Minister Sergey

Shoigu has ordered a pilot project of a mobile low-power nuclear station to be mounted on a tracked vehicle or a sledged platform to be delivered where needed in the Arctic region.

"The project has already begun and is going through a research stage now," TASS cited Yury

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Konyushko, CEO of Innovation Projects Engineering Company (IPEC), which has been chosen to work on the project. Preliminary data is to be presented to the military by the end of this year, Konyushko said....

...The technical characteristics of the mobile NPPs demanded by the Defense Ministry have not been disclosed. The units are expected to be produced on a modular principle and mounted on KAMAZ and MAZ trucks, as well as sledge-mounted for harsh Arctic conditions. A principal condition for the future mobile nuclear power stations is that they could be transported by military cargo jets and heavy cargo helicopters, such as the Mil Mi-26. "There is a demand for no less than 30 such [nuclear power plant] units for Extreme North and reclaiming Arctic archipelagos," Konyushko said.

The future mobile NPPs are going to be fully autonomous and designed for years-long operation with a small number of

personnel. At the same time, all data from the unit's controls and sensors will be constantly sent to control rooms on the mainland using satellite connections for constant monitoring. The first tracked mobile nuclear power plant was designed in the USSR in 1961. It was followed by a number of projects, all of which were discontinued following the Chernobyl nuclear catastrophe in 1986. Today, Russia is finalizing another transportable nuclear power project, the first floating nuclear power plant built for use in the Arctic, which will be ready by October 2016.

Source: <https://www.rt.com/>, 04 November 2015.

USA

White House Gets Behind Nuclear Power to Fight Climate Change

The American Nuclear Society just wrapped up its annual meeting in Washington, D.C. Since the theme was how nuclear energy is essential to address climate change.... In most international

climate talks over the last 25 years, the US has downplayed the fact that most of our low-carbon electricity generation is from nuclear power. You never hear that in most media discussions. But now the White House is talking nuclear up.

Kirsten Cutler, the Obama administration's assistant director for nuclear energy and nonproliferation, said, "[This Nuclear Summit] provided valuable insights on why maintaining US leadership in nuclear energy is important for supporting economic competitiveness and jobs creation, enhancing international nuclear safety, security standards and nonproliferation controls, and enabling the next generation of nuclear scientists, engineers, and technology developers to build the future of nuclear energy."

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Given that the global nuclear power industry is set to expend over \$1.5 trillion in the next 20 years, it is certainly important that the US maintains itself as a leader in this field. We have the largest, safest

and the most effective nuclear program in the world. ...The discussion started off with a talk by Dr. Richard Somerville on climate change. A Distinguished Professor Emeritus at Scripps and a theoretical meteorologist, Somerville was a lead author on the Intergovernmental Panel on Climate Change report that was awarded the Nobel Peace Prize in 2007.

Somerville pulled no punches and stated that, as a world, we are just not doing enough, quickly enough, to address this issue (see figure, bit busy but worth the read). The longer we wait, the more difficult it will be to keep global warming to a mere 2°C (3.6°F). In fact, at the rate we are not acting, we will see a 7°C (12°F) rise in global temperatures this century which will drastically lower crop yields and change weather patterns to our detriment. The World Bank released a report saying that over a hundred million climate exiles will be generated by global warming, numbers that dwarf the present Syrian crisis.

...As the US prepares for the next United Nations Conference on Climate Change (COP21) in Paris in December 2015, the Administration understands how important nuclear energy is in addressing the twin dilemmas facing humanity: Energy Poverty: the only way to eradicate global poverty, and its evil stepchildren war and terrorism, is to bring at least 3,000 kWhs to everyone on Earth, necessitating an additional 15 trillion kWhs of electricity each year to power the 9 billion people who will live on Earth in about 2040. This almost doubles the amount we produce now, and requires capital investments of well over \$5 trillion, no matter what energy mix we choose....

Source: <http://www.forbes.com/>, 12 November 2015.

NUCLEAR COOPERATION

ARGENTINA–RUSSIA

Argentina has Great Interest in Deepening Cooperation and Strengthening its Ties with Russia

Argentina has great interest in deepening cooperation and strengthening its ties with Russia, Matias Garcia Tunon, a coordinator of the Russian-Argentine Commission on Trade, told Sputnik. "Argentina has a great interest in closer cooperation with Russia, there is a great interest to strengthen ties" between the two countries, Garcia Tunon said.

Valentina Matvienko met with Argentine President Cristina Fernandez de Kirchner in Buenos Aires. The two discussed development of the economic ties, as well as broadening cooperation in the nuclear energy and space spheres.... In April 2015, Kirchner met with Russian President Vladimir Putin in Moscow. The sides signed several cooperation deals and confirmed that bilateral ties between Moscow and Buenos Aires were strengthening.

Source: <http://sputniknews.com/>, 13 November 2015.

CHINA–USA

A new agreement formalizing nuclear cooperation between China and the USA and establishing the terms for nuclear trade between the countries has entered into force. The agreement replaces a previous version which had been due to expire at the end of the year 2015.

The existing US-China agreement was enacted in 1985, covering a 30-year period. Its renewal means that projects such as Westinghouse's AP1000 reactor exports, which use many US-based suppliers, as well as US-Chinese nuclear collaborations can continue unimpeded.

Bilateral nuclear cooperation agreements - often referred to as 123 agreements, as they are required under subsection 123 of the US Atomic Energy Act of 1954 - are a

prerequisite for nuclear trade and materials transfer between the US and any other country. They provide a comprehensive framework for peaceful nuclear cooperation as well as permitting the transfer of material, equipment (including reactors), components, information, and technology for nuclear research and nuclear power production.

President Barack Obama approved the renewal of the agreement in April 2015, sending it before the US Congress for review. The agreement has now entered into force after completing its mandatory review over a total period of 90 days continuous session by the Senate Foreign Relations Committee and the House Foreign Affairs Committee. The existing US-China agreement was enacted in 1985, covering a 30-year period. Its renewal means that projects such as Westinghouse's AP1000 reactor exports, which use many US-based suppliers, as well as US-Chinese nuclear collaborations can continue unimpeded.

The US nuclear industry, through the Nuclear Energy Institute (NEI), has previously urged Congress to approve the renewal. The institute's vice president for suppliers and international programs, Daniel Lipman, welcomed its entry into force, saying: "The nuclear energy industry

applauds the renewal of the US-China agreement for nuclear energy cooperation." The direct economic benefit to the country from the renewed agreement is expected to be between \$70 billion and \$204 billion in the period to 2040, he said. China currently has 22 reactors under construction, with work to start on many more. The first of four Westinghouse AP1000s under construction in China, Sanmen 1, is expected to start up next year. The AP1000 design has been standardized for many of China's planned nuclear power plants and work is expected to begin on a further 13 reactors by 2017, NEI noted....

Source: *World Nuclear News*, 10 November 2015.

INDIA-UK

India-Britain Civil Nuclear Agreement Signed

India and Britain signed a civil nuclear cooperation agreement after the two sides held delegation-level talks in UK. ...The conclusion of the civil nuclear agreement is a symbol of our mutual trust and our resolve to combat climate change," Modi said while issuing a joint statement along with British Premier David Cameron.

"The agreement for cooperation in India's Global Centre for Clean Energy Partnerships will strengthen safety and security in the global nuclear industry," he said. He said India attached great value to defence and security cooperation with Britain, including regular exercises and defence trade and collaboration. "This cooperation will grow. I am also pleased that UK will participate in the International Fleet Review in India in February 2016. UK will also be a strong partner in India's defence modernization plans, including our 'Make in India' mission in defence sector," Modi said....

The direct economic benefit to the country from the renewed agreement is expected to be between \$70 billion and \$204 billion in the period to 2040, he said. China currently has 22 reactors under construction, with work to start on many more. The first of four Westinghouse AP1000s under construction in China, Sanmen 1, is expected to start up next year.

Source: <http://www.tribuneindia.com/>, 12 November 2015.

India, Australia Nuclear Deal to Come into Force

A year after India and Australia signed the civilian nuclear cooperation agreement during then Australian PM Tony Abbott's visit to New Delhi, his successor, Australian PM Malcolm Turnbull told PM Narendra Modi that procedure for the pact has been completed and can now be implemented. This

opens doors for the much-needed uranium supply for India's nuclear reactors.

After the meeting, Ministry of External Affairs spokesperson Vikas Swarup described it as "milestone achievement" as the two PMs announced completion of procedures for the agreement. "The PM thanked the Australian PM and said the nuclear agreement is a milestone and a source of trust and confidence. With the completion of procedures,

including administrative arrangements, the Civil Nuclear Agreement will now enter into force," he said. This was Modi's first meeting with Turnbull after he took over. Sources described the meeting to be "very constructive" and pointed out to the result-

oriented conversation in their first-ever bilateral meeting.

Source: <https://in.news.yahoo.com>, 15 November 2015.

KAZAKHSTAN-IRAN

Kazakhstan Eyes Nuclear Cooperation with Iran

Kazakhstan's Deputy Foreign Minister Rapol Zhoshybayev announced that his country is engaged in the nuclear technology activities and is weighing plans to construct two nuclear power

plants in Kazakhstan. Astana can cooperate with Tehran in this field, he noted, while speaking at a press conference in Kazakhstan's embassy in Iran. Zhoshybayev also added that the Iranian officials have had a "positive" attitude towards the idea of nuclear cooperation with Kazakhstan.

The Kazakh diplomat held meetings with a number of top Iranian officials earlier in the day and discussed a range of issues, including Iran's presence in the Expo-2017, to be held in Astana. In 2012, Astana was chosen by the International Exhibitions Bureau (BIE) as the venue to host Expo-2017, which will focus on the theme "Future Energy".

Source: <http://www.tasnimnews.com/>, 11 November 2015.

NUCLEAR PROLIFERATION

NORTH KOREA

Forget China – N. Korea Markets Missiles Despite Iran Nuclear Deal

While Iran, the North's partner on missile and nuclear deals, has agreed to stay away from enriching uranium for nuclear weapons, North Korea leader Kim Jong-un remains impervious to pleas to follow that example. As the Iran nuclear deal takes effect, South Korean physicist Chang Soon-heung believes South Korea and the US "must cooperate with China" in the quest for a "creative solution" to the impasse with the North.

From his vantage as president of Handong Global University in the fast-growing city of Pohang on Korea's east coast, Chang harks back to the 1994 Geneva framework under which North Korea was promised two light-water nuclear energy reactors produced in South Korea in return for giving up its nuclear weapons program. A member in that period of the international safety group of the IAEA Chang believes the Geneva agreement, had the US and North Korea abided by its terms and South

Korea's Korea Electric Power Corporation, KEPCO, installed the reactors, would have worked.

The Iran nuclear deal, Chang believes, adds urgency to the need for a new deal with North Korea. It's time, he says, for a fresh understanding despite the danger of North Korea conducting another nuclear test. "I would like to ask the US and our government to create a solution," he says. Chances of North Korea giving up its proud position as one of the world's nine nuclear powers appear virtually nil, however, as long as the North works closely with Iran on missiles and nuclear technology. James Lewis, director of strategic technologies at the Center for Strategic and International Studies in Washington, says Iran and North Korea scaled down their activities for several months while Iran negotiated the nuclear deal with the US but are back to business as usual. "We assume they are coordinating on such activities," he says.

...Bruce Bechtol, a former US marine intelligence analyst and author of numerous studies on North Korea's leadership and armed forces, predicts

Behind the North Korean launches is the desire not only to display North Korea's military power in northeast Asia, as a counterpoint to US, South Korean and Japanese forces, but also to market its missiles mainly in the Middle East as it's done for years. North Korea counts on its prowess in missiles for earning sorely needed income while China, the source of virtually all the North's oil and most of its food.

North Korean scientists and engineers sooner or later "are likely to launch their latest version of the Taepodong" – the long-range missile that's capable of reaching the US. The North, he says, "may follow up with an underground nuclear test" – fourth in a series that includes tests in 2006, 2009 and 2013.

At the same time, North Korea has repeatedly declared its "legitimate right" to fire long-range missiles in order to put a satellite into orbit, as it did nearly three years ago, but the real purpose clearly is to see how far and well the missile can travel. At the same time, North Korea over the past two years has repeatedly tested mid-and-short-range missiles.

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for years. North Korea counts on its prowess in missiles for earning sorely needed income while China, the source of virtually all the North's oil and most of its food, goes through an economic downturn that impacts the North's dilapidated economy. "North Korea has thousands of missiles in warehouses," says Bechtol, "They've got munitions factories making more of them."

Most of North Korea's missiles for years have been going to buyers in the Middle East, notably Iran and Syria but also Egypt, Yemen, Libya and other markets. Although slowed down by sanctions, sales of short-range Scuds and mid-range Rodongs have been an important source of foreign exchange for the financially strapped regime.

Source: <http://www.forbes.com/>, 13 November 2015.

NUCLEAR NON-PROLIFERATION

IRAN

Iran Begins Deactivating Centrifuges Under Nuclear Deal's Terms

Iran has started decommissioning the first of thousands of centrifuges used for enriching uranium as part of its commitments under the nuclear deal reached with global powers.... The head of the Atomic Energy Organization of Iran, Ali Akbar Salehi, told the Kyodo News agency that Iran had started preliminary work, referring to centrifuges and other steps. The entire process will "take some time," said Mr. Salehi, who is also a vice president, a former foreign minister and a member of the nuclear negotiating team. Iran needs to take most of its centrifuges, spread over two facilities, out of service, reducing their numbers from 19,000 to around 6,000.

...Under the nuclear agreement reached in July 2015, Iran promised to reduce its enrichment capabilities and overhaul a heavy-water facility, turning it into a less dangerous light-water reactor. It also needs to fully answer a set of questions about the possible military dimensions

of its program. In exchange, economic sanctions will be lifted, but only after the International Atomic Energy Agency confirms that Iran has lived up to its commitments.

Iran's supreme leader, Ayatollah Ali Khamenei, endorsed the nuclear agreement in October 2015

but with a set of conditions, including a call for Parliament to oversee the execution of the deal... A group of 20 hard-line lawmakers demanded that the government stop the decommissioning of the centrifuges because a special parliamentary committee to monitor the process sought by

Ayatollah Khamenei has not yet been formed.

"Unfortunately... a number of contractors entered the Fordo site to remove the centrifuges and the infrastructure at this site, and they have said that it will take them two weeks to finish the work," the lawmakers wrote in a letter to President Hassan Rouhani, referring to one of the two enrichment plants. The government is in need of cash, and some officials have argued that each delay in meeting the terms of the nuclear accord will only prolong the sanctions.

Source: <http://www.nytimes.com/>, 02 November 2015.

NUCLEAR SAFETY

IRAN

AEOI Chief Sets Off for Japan for Nuclear Safety Talks

Ali Akbar Salehi, the Atomic Energy Organization of Iran has set off for Tokyo to hold talks with Japanese officials about nuclear cooperation, including in the safety field. AEOI spokesman Behrouz Kamalvandi said that Iran and Japan have exchanged delegations over the recent months and discussed ways to boost nuclear safety cooperation. He added that Salehi's visit to Tokyo is taking place to follow up negotiations about cooperation in nuclear safety. During his four-day stay in Tokyo, the AEOI director is scheduled to hold talks with Japanese nuclear scientists and

officials from Japan Nuclear Energy Safety Organization (JNES) and Nuclear Regulations Authority (NRA), he noted.

Source: <http://www.tehrantimes.com/>, 02 November 2015.

NUCLEAR WASTE MANAGEMENT

AUSTRALIA

Australia Reveals Shortlist for First Nuclear Waste Dump

Australia on Friday announced six sites, including some in Outback areas, on a shortlist for the nation's first nuclear waste dump, risking fresh controversy after an earlier plan was scuttled by opposition from Aboriginal landowners. The government said it had received 28 applications from owners willing to house low to intermediate waste – mostly by-products of nuclear medicine – and had whittled that down to six which will be subject to feedback and consultation.

Plans to locate Australia's first nuclear waste dump at the remote Muckaty Station in the sparsely populated Northern Territory were abandoned in 2014 after a long battle with indigenous landowners.

"Australia has an international obligation to deal with its own low-level and intermediate nuclear waste that it creates. And currently this waste is stored at around 100 sites in Australia," Resources Minister Josh Frydenberg said. "We will only go ahead with the support of the local communities." The minister said the low-level waste, including material left over from medical treatments such as paper, gloves and goggles, would be enough to fill two Olympic-size swimming pools.

There was a smaller amount of intermediate waste, which includes steel rods used in Australia's only nuclear reactor, a facility mostly used for nuclear medicine and research.

The minister said that apart from payment to the

landowner, the chosen site would receive up to Aus\$10 million (US\$7 million) to fund community causes. A final decision is expected in late 2016. Frydenberg said the project only related to storing Australia's radioactive waste. ... South Australian lawmaker Rowan Ramsey, a leading supporter of the project whose electorate includes three of the sites, said he was hopeful a "scare campaign" would not derail what he said be a boon for the local economy.

The six areas, all hundreds of kilometres from major cities, are Sallys Flat in New South Wales, Cortlinye, Pinkawillinie and Barndioota in South Australia, Hale in the Northern Territory and Oman Ama in Queensland. Residents in some areas are not keen. ... Frydenberg's announcement comes amid growing debate about nuclear energy in Australia, which has one of the world's largest reserve of uranium but does not use nuclear power. A Royal Commission in South Australia state is currently investigating all aspects of the nuclear fuel cycle.

In the 1990s and early 2000s Australia sent radioactive waste from spent nuclear fuel to France for reprocessing, and 25 tonnes of this reprocessed material is now on a ship on its way back. Once it arrives, the material will be kept at the Lucas Heights reactor in southern Sydney until the nuclear waste dump site is selected and built.

Source: <http://phys.org/news/2015-11-australia-reveals-shortlist-nuclear-dump.html>, 13 November 2015.

FINLAND

Licence Granted for Finnish Used Fuel Repository

The government included several conditions in the construction licence. When applying for an operating licence, Posiva is required to submit analyses concerning the environmental impacts of the facility, the retrievability of the used fuel, the transport risks involved and any changes that

The government said it had received 28 applications from owners willing to house low to intermediate waste – mostly by-products of nuclear medicine – and had whittled that down to six which will be subject to feedback and consultation. Plans to locate Australia's first nuclear waste dump at the remote Muckaty Station in the sparsely populated Northern Territory were abandoned in 2014 after a long battle with indigenous landowners.

may have been introduced in the project. A maximum of 6500 tonnes of uranium may be disposed of in the facility.

The used fuel will be packed inside copper canisters at the encapsulation plant, from where they will be transferred into the underground tunnels of the disposal facility, located at a depth of 400-450 metres, and further into the deposition holes lined with bentonite buffer. The site for Posiva's repository at Eurajoki near Olkiluoto was selected in 2000. The Finnish parliament approved the decision-in-principle on the repository project the following year.

Posiva, jointly owned by Finnish nuclear utilities Fortum and Teollisuuden Voima Oyj (TVO), submitted its construction licence application to the Ministry of Employment and the Economy in December 2013 with the aim of permanently storing the used nuclear fuel from its owners' nuclear power plants. The application covered the construction of the encapsulation plant and repository, as well as for facilities for the final disposal of waste created during the operation and decommissioning of the encapsulation plant.

In February 2015, Finland's radiation and nuclear safety authority, STUK, gave its backing to Posiva's application to construct a final repository and waste encapsulation plant. Posiva said the government's favourable decision for the construction licence was "recognition for the extensive R&D work carried out by Posiva for more than 40 years". It said, after gaining research results and experience from the Onkalo underground rock characterization facility, it is now "about to move on to the construction of the final disposal facility".

Posiva expects construction work on the repository to start in late 2016 and operations to begin in 2023. Minister of economic affairs Olli Rehn said, "The construction licence granted now is the first in the world for a used nuclear fuel disposal facility. Finland is an international pioneer in nuclear waste management, which also obliges us to take care of matters responsibly and safely in future. Finnish expertise also provides us with commercial opportunities in developing nuclear waste management in other countries." ...

Source: <http://www.world-nuclear-news.org/>, 12 November 2015.

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