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## OPINION-Manpreet Sethi

### Building Castles in the Air: Critique of the First Use by India Hypothesis

Imminent use of nuclear weapons by Pakistan will make India go first, carry out a comprehensive first strike, and take out Pakistan's nuclear arsenal. So said an MIT scholar at a recent conference on nuclear policy. He opined that India will mount a "full comprehensive and preemptive nuclear counterforce strike" that could "completely disarm Pakistan of its nuclear weapons so that India does not engage in iterative tit-for-tat exchanges and expose its own cities to nuclear destruction."

There are several problems with this hypothesis. Firstly, there never is any guarantee that "imminent" use of nuclear weapons is not an exercise in coercive diplomacy by the adversary. By doing preemption then, the first user would have guaranteed retaliation on oneself. Secondly, carrying out a full, comprehensive counterforce strike requires a credible first-strike-capable nuclear force. This means large numbers of nuclear-tipped missiles of very high accuracy, an early warning and intelligence capability of a very high order given the mobility of

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the adversary's nuclear assets, nuclear targeting coordination, and logistics of a very high capability to obviate all chance of retaliation. The demands of such capabilities require deep pockets and a full panoply of high-end technology. India neither has nor will have spare cash of this kind in the foreseeable future. Therefore, complete disarming of Pakistan is just not possible. And if that doesn't happen, then despite the first strike, Indian nuclear use would only have ended up exposing its cities to nuclear destruction, the

very scenario Narang presupposes India would go nuclear first to avoid.

For the above reasons, moving to a first use nuclear strategy makes no sense. In a vibrant democracy, intellectual thinking and voicing of views by all—former officials as well as scholars and academics—is a constant process of churning of ideas. The purpose of each such action is to find better solutions to national security and new ideas are worth exploring. But there still appears to be no logical benefit of moving to a first use doctrine. In fact, it is for this reason that India finds Pakistan's first use doctrine so incredible. Retaliation makes for a far more credible strategy since the first use of the weapon can never be an easy decision for any rational national leader, especially when he knows that he would end up inviting retaliation. Moreover, a first use doctrine puts the adversary on edge, exacerbating his sense of use or lose, and making him drawn to the nuclear trigger in fear of preemption. Even threatening preemption is likely to invite the same.

It was to avoid the use of nuclear weapons, or to use them for nuclear deterrence, that India acquired its nuclear capability. To go first in situations where the adversary has a secure second-strike capability would be a self-defeating proposition. And to move towards declaring such a strategy with no hope of ever being able to build such a capability would be downright dangerous. Successive Indian Prime Ministers have reinforced the Indian doctrine of no first use. Hopefully, the wisdom will continue to prevail.

*Source: South Asian Voices, 23 March 2017.*

**OPINION-Rajesh Rajagopalan**

**India's Nuclear Strategy: A Shift to Counterforce?**

Two close observers of Indian nuclear policy recently suggested that official thinking about India's nuclear strategy may be moving in a radical new direction, towards a first-use or even a first-

strike strategy. Until now, it had been assumed that Indian nuclear policy would be retaliatory rather than pre-emptive, and that it will be focused on countervalue (i.e., the adversary's cities) rather than counterforce (the adversary's nuclear forces) targets.

For India, both a first-use and a first-strike strategy (and they are not the same) are the wrong choices for the simple reason that they will be ineffective in achieving either its wartime or deterrence requirements, in addition to embroiling India in an unnecessary nuclear arms race, and is likely to lead to dangerous crisis instability to boot. But, before considering these issues, an equally important question needs to be asked: how credible are the claims that Indian nuclear strategy may be changing?

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Vipin Narang argued in a presentation at the Carnegie International Nuclear Policy Conference that comments made by senior Indian officials — specifically an essay written by Lt. Gen. B.S. Nagal, former commander of India's Strategic Forces Command (SFC), the "personal" comments made by former Defence Minister Manohar Parrikar, and most importantly, in the chapter on India's nuclear doctrine in the recent book

by Shivshankar Menon, the former National Security Advisor — suggest that India may launch a nuclear attack first if and when it believes Pakistan is ready to cross the nuclear threshold and that this might take the form of an attempted full counterforce strike against Pakistan. Narang points to other pieces of evidence that India is working towards this strategy: the focus on MIRVs (Multiple Independently-targetable Re-entry Vehicles), missile defences, missile accuracy, readiness, and numbers. Shashank Joshi backs up Narang, arguing that these comments by former senior officials are "indicative of the fluid, elusive nature of nuclear strategy, as well as a more uncertain security environment and growing confidence in Indian capabilities."

How credible are the claims that Indian nuclear strategy may be changing?

Neither Narang nor Joshi claim these as settled changes. Joshi suggests that Menon's words are "more likely a warning, than an indication of imminent shifts," while Narang is more categorical that this is "where India may be heading, and certainly wants to head." But it is difficult to judge whether former officials are outlining their personal views or reflecting an internal debate when they write, considering that even ministers feel little compunction in pontificating about personal views on critical nuclear issues in public. But there is little indication in the writings of these officials that they have grappled with the serious problems that comes with a first-strike or a first-use strategy (outlined below), which suggests these are not well thought or researched policy positions in an internal debate. That these are positions taken by former officials means that they need to be seriously debated, but that is a far cry from seeing it as indicative of the direction of official policy.

A more serious problem is that there is no clear evidence that India is attempting to develop the capabilities that it needs for such a strategy. Each of the indicators that Narang points to could have other explanations. For example, India's BMD programme is over two decades old, starting well before India's 1998 nuclear tests. It is possible, of course, that whatever its origins, India now considers its BMD programme as part of a damage-limitation first-strike strategy. But it is difficult to make this assumption without better evidence of the link between the BMD programme and any change in India's nuclear employment strategy.

A more credible piece of evidence is India's push for greater accuracy of its missile systems. Obviously, there is little need for accuracy if India were considering hitting only cities and so the push for greater accuracy could be seen as presaging a counterforce strategy. Similarly, MIRVing of missiles may also appear to be less important for a minimal deterrent force that targets only cities. But as Narang himself pointed out in an earlier essay, many of these capabilities are being developed by the Defence Research and Development Organization (DRDO) without political sanction. While such unauthorised development (or at least the DRDO boasting about them) could possibly force political decisions later, there is little indication of anything of that sort happening yet.

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Narang also points to India developing more missiles, but there is little indication of any spurt in the numbers of India's missiles. Moreover (as I point out below) any first-strike or even first-use strategy would require India to have a nuclear arsenal far larger than Pakistan's, whereas what exists is a significant nuclear imbalance in

Pakistan's favour. Not only do we not see any dramatic growth in Indian nuclear forces, we have not even heard any expression of concern by any Indian official about this imbalance, which suggests that Indian officials are not particularly concerned about it. This by itself is an

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important indicator that India is not considering a counterforce strategy, at least in any systematic manner.

Still, it is important to reflect on the implications of a counterforce first-use or first-strike strategy, if only because it is now the central issue in the Indian nuclear debate. But first, there has to be

some clarity about terms and concepts. What Shivshankar Menon is suggesting, it appears, is not so much a “first strike” strategy, but a first-use one that may be entirely or partially a counterforce strike. But all counterforce strikes are not “first strikes”. Even an entirely counterforce first attack is not a “first strike” strategy. Traditionally, first-strike is a bolt-from-the-blue attack, with no warning, which means that the targeting side does not have to worry about the adversary dispersing its mobile systems and bombers. This is the assumption that Keir A. Lieber and Daryl G. Press make, for instance, in their well-received study on US nuclear superiority. But, all the discussion in the debate about Indian first-strike, both from Menon and Nagal as well as in the responses to them, refer to India attacking either after a Pakistani nuclear attack or in the context of an imminent Pakistani nuclear attack. Neither fit the pattern of a ‘bolt from the blue’ attack because in a crisis situation, Pakistan will already be on alert and has potentially already dispersed its nuclear weapons. (Even if they had not planned to do so until now, this Indian debate will certainly force their hand). This is thus better described as first-use than as first-strike.

There has to be some clarity about terms and concepts. What Shivshankar Menon is suggesting, it appears, is not so much a “first strike” strategy, but a first-use one that may be entirely or partially a counterforce strike. Even a true surprise first-strike strategy, which may be possible with a relatively smaller arsenal, is simply not viable for India because it does not have the necessary superiority vis-à-vis Pakistan in nuclear warheads. The numbers problem becomes even

more onerous if India is considering a first-use strategy, after Pakistan is already alerted.

Considering the requirements of a first-strike strategy against Pakistan will illustrate the problems that India faces. Pakistan has dozens of ballistic missiles of varying ranges which are deployed, according to one assessment, in seven to eight garrisons. Pakistan’s F-16s, Mirages and J-17s fighter-bombers, which are generally suspected to have nuclear missions, are based or have been spotted at about half a dozen different Pakistan Air Force (PAF) airbases. That makes about fifteen targets. If some of the most important command and control sites are included (the three service headquarters and the Strategic Plans Division) as well as key facilities associated

with nuclear weapons (the assessment by Kristensen and Norris, cited above, mentions nine facilities, which is a good starting point: Gadwal, Khushab, Chasma, Nilore, Kala Chitta Dhar, Fatehjung, Tarnawa, Taxila, and Wah) plus a couple of the Corps headquarters that might be in charge of Pakistan’s TNWs, an extremely conservative estimate suggests around 30 counterforce aimpoints.

India is currently thought to have about 100 to 110 nuclear warheads, deployed on a mix of missiles and aircraft. Considering that China has a much larger nuclear arsenal and is also a much larger country, it would not be implausible to assume that India devotes a larger part of its arsenal for China oriented missions than Pakistan oriented ones. But even if it is assumed that India needs only half of its arsenal for China oriented missions,

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that leaves just about 50 to 55 warheads for these thirty-odd counterforce target aimpoints. Calculating the number of warheads per aimpoint is complicated, with variables including the hardness of the target and the reliability of the warhead and delivery vehicle. Lieber and Press, for example, suggest that the US needs anywhere from one warhead (for nuclear weapons storage facilities) to as many as seven warheads (for Russian silo-based and land-mobile missiles) depending on the type of target.

In India's case, there is little information about reliability, warhead yields or target hardness. Still, assuming (very) generously that India needs only two warheads per aimpoint, it needs at least 60 warheads even for such a truncated target list. Of course, Indian decision-makers will also need to keep some weapons in reserve to target any surviving Pakistani nuclear assets and to retaliate if Pakistan attacks India with these. If we assume just 30 reserve warheads, India needs a total of about 90 warheads just to conduct a surprise 'splendid' first-strike against Pakistan, which will leave India with barely two dozen warheads to deter China. In India's case, there is little information about reliability, warhead yields or target hardness.

The numbers problem would be insurmountable in a first-use strategy of the kind discussed by Menon and Nagal, which is in the context of an India-Pakistan crisis, when Pakistan can be expected to have already dispersed its nuclear forces. For example, even targeting Pakistan's air-based nuclear weapons will be difficult. India will have to target all 25 to 30 airbases and airfields from where Pakistan could deploy its nuclear-capable bombers, instead of just half-a-dozen airbases that it could target in a true surprise first-strike. This does not exhaust the list of bomber-

basing options for Pakistan, of course. Pakistan has over one hundred airports and it has even practiced landing aircraft on highways to disperse them in times of crisis. In addition, Pakistan's missiles are road-mobile, and it is unlikely that India will be able to find them after they are dispersed. Thus, a true surprise first-strike attack may be possible if India dramatically increased the size of its nuclear arsenal and achieved significant numerical superiority over Pakistan. But a counterforce attack on Pakistan in a crisis, after it is alerted, is simply not feasible even if India

had a larger arsenal than Pakistan because India will not succeed in hitting more than a handful of Pakistan's nuclear weapons, which will achieve little even as a damage limitation exercise.

There are additional problems with moving towards a first-use strategy. Such a strategy requires India to achieve significant numerical superiority, which will lead to an arms race because Pakistan will be forced to respond, and it can depend on China to help out.

More worryingly, it could

also worsen crisis instability if both sides are worried that the other might launch first, a condition Thomas Schelling described decades ago as the 'reciprocal fear of surprise attack.'

Finally, the key question is about whether such a strategy will better serve to deter Pakistan because Menon and Nagal appear to be more interested in winning a nuclear exchange than in deterring it. While there are significant credibility problems in threatening to launch a massive nuclear attack on Pakistan's cities in response to a Pakistani TNW attack, the credibility problems in threatening a counterforce attack on Pakistan is greater because of the level of numerical superiority it requires, which India does not have and is unlikely to achieve. Non-credible threats dilute India's deterrence, and moving towards a

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counterforce strategy will only worsen India's nuclear deterrence credibility problem. The proposals made by these former officials require consideration and should be debated. But it is unlikely that these proposals reflect official thinking or that they suggest India may be considering a first-use or first-strike strategy.

Source: <http://www.orfonline.org/>, 29 March 2017.

**OPINION- Abhijnan Rej**

**India is Not Changing its Policy on No First Use of Nuclear Weapons**

Everything you know about South Asian pink flamingos is false, a prominent nuclear-weapons expert has recently warned. Pakistan's expanding nuclear arsenal has been a matter of considerable concern to the international community in the recent years. Its adoption of short-range, low-yield tactical nuclear weapons in the face of India's conventional military superiority have pointed to the possibility where Pakistan uses a nuclear weapon against Indian conventional armed forces to stave off imminent military defeat. "This is how nuclear first use would unfold in South Asia, right? Well, maybe not so fast," wrote Vipin Narang, a professor at MIT, in a set of remarks prepared for the recent Carnegie International Nuclear Policy Conference. Narang made a startling claim:

**The proposals made by these former officials require consideration and should be debated. But it is unlikely that these proposals reflect official thinking or that they suggest India may be considering a first-use or first-strike strategy.**

There is increasing evidence that India will not allow Pakistan to go first. And that India's opening salvo may not be conventional strikes trying to pick off just Nasr batteries in the theater, but a full "comprehensive counterforce strike" that attempts to completely disarm Pakistan of its nuclear weapons so that India does not have to engage in iterative tit-for-tat exchanges and expose its own cities to nuclear destruction.

The possibility that India might use nuclear weapons first directly contradicts the key pillar of Indian nuclear thinking since the publication of

its official nuclear doctrine in 2003: a no first-use policy. Successive prime ministers — including Narendra Modi, not exactly a dove — have affirmed this. Indeed, a major revision of India's public doctrine will fly in the face of its long history as a reluctant nuclear power. On the other hand, the evidence Narang marshals to support this astounding claim is scant and centers around a couple of paragraphs from a book by a former Indian national security advisor Shivshankar Menon who retired three years ago, before Modi came to power.

Despite Narang's claims, we still do not have sufficient evidence that India has reversed its no first-use policy or — for that matter — any other major tenets in its public nuclear doctrine. Indeed, at a time when there are growing calls inside India to revisit its nuclear doctrine, it is worth keeping in mind that India's doctrine already allows considerable space for innovation. As Menon put it to a journalist, "India's nuclear doctrine has far greater flexibility than it gets credit for." In other words, India's extant doctrine can absorb the consequences of future Pakistan-related contingencies without any major changes.

*Restraint and Resolve in India's Nuclear Doctrine*

India's nuclear weapons strategy is simple. By relying on a minimal arsenal for deterrence, India offers a credible threat of a massive retaliation against an adversary that strikes first with nuclear weapons. India's commitment to nuclear deterrence (as opposed to compellence, the other tool of strategic coercion) rules out threats of nuclear use to shift the course of a conventional conflict. Indeed, India's a no first-use stance should be read as a pledge to not use nuclear compellence as an instrument of statecraft. India's nuclear arsenal is as small as it can be to make the threat of a massive retaliation as credible as possible. As such, the size of the arsenal will vary with time depending on the requirements of

credibility, a fact that was emphasized by a former Indian foreign minister.

What makes a deterrent strategy effective? It is, argues the Nobel-winning game theorist Roger Myerson, a combination of “restraint” and “resolve” in pursuing the same. Following Thomas Schelling, Myerson defines restraint as a “reputational commitment to act cooperatively” in pursuit of a deterrent strategy. Resolve, for Myerson àpres Schelling, is a similar commitment, but to act aggressively when deterrence demands it. India’s public doctrine — in what it says and what it does not — seeks to do both. It is a statement of restraint in two ways. First, it conveys the impression that India is a responsible nuclear power with a public pledge to not use nuclear weapons first.

Second, by explicitly laying down India’s nuclear red-lines coupled to its no first-use pledge, India effectively promises any adversary that it will cooperate in terms of not using nuclear weapons first — as long as the adversary

too chooses to do the same by not crossing those redlines. But the doctrine is also a statement of resolve in that it deliberately does not spell out what follows deterrence failure beyond a promise of some kind of massive retaliation. Regarding the targets of such aretaliation, India’s public nuclear doctrine is ambiguous.

If India leaves out the exact details of its retaliatory response, potential adversaries will imagine the “worst” possible outcome. Taking Pakistan as an example of an adversary, what “worst” means in Islamabad’s mind alone and could change during the course of a conflict. Indeed, both India and Pakistan may have different conceptions of what the latter values the most, and hence wants to protect. For example, India might think Pakistan values its population centers the most, but Islamabad may in fact value its “crown jewels” more. Therefore, if India was to keep its retaliatory responses ambiguous beyond the fact that there will be a massive

response, its commitment to act aggressively — India’s resolve — will be enhanced in Pakistan’s mind, irrespective of whether India has any intention of doing what Pakistan thinks it would. Indeed, as Lawrence Freedman put it, “To Schelling the value of nuclear weapons lay in the persuasive threat they posed to an adversary, even if little of value could accrue to oneself by implementing this threat.” What matters is that Pakistan now has to consider a range of retaliatory responses from India. On the other hand, if India was to promise Pakistan a fixed response, but Pakistani leaders did not believe it, Islamabad may be tempted to ignore India’s threats of what follows should deterrence break down.

“Massive” Retaliation or “Massive Retaliation”?

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Narang’s claim that India’s no first-use posture may be eroding follows from his interpretation of a recent book by a highly-respected former Indian national security advisor Shivshankar Menon. In that capacity, Menon was a member of the executive

council of the Nuclear Command Authority, the highest non-political body that supervises India’s nuclear weapons and their potential deployment. As such, he must have been privy to India’s choice of second-use targets should deterrence fail.

In Choices: Inside the Making of India’s Foreign Policy, Menon devotes a chapter to India’s nuclear weapons doctrine and posture. The general thrust of his argument becomes clear from the title of that chapter alone: “Why India pledges no first use of nuclear weapons.” He indeed goes to justify and defend the thinking behind a no first-use pledge, and the foreign policy circumstances that shaped it. The passage that caught Narang’s attention lies a few pages into the chapter:

What would be credible would be the message India conveyed by how it configures its forces. If Pakistan were to use tactical nuclear weapons against India, even against Indian forces in Pakistan, it would effectively be opening the door

to a massive Indian first strike, having crossed India's declared red lines. There would be little incentive, once Pakistan had taken hostilities to the nuclear level, for India to limit its response, since that would only invite further escalation by Pakistan. India would hardly risk giving Pakistan the chance to carry out a massive nuclear strike after the Indian response to Pakistan using tactical nuclear weapons. In other words, Pakistani tactical nuclear weapons use would effectively free India to undertake a comprehensive first strike against Pakistan.

His use of the phrase "comprehensive first strike" is indeed striking (forgive the pun). A first strike in nuclear strategy means something very specific: a disarming nuclear weapons attack that severely degrades the adversary's ability to retaliate with the same. In other words, a comprehensive first-strike is a "counter-force" strategy aimed at the adversary's nuclear arsenal and not its population centers. But it is clear from the paragraph that Menon is

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talking about a second strike, the first being Pakistan using a tactical nuclear weapon against Indian forces. So why the use of the word "first"? One explanation is that this is a problem with how one counts attacks and counter-attacks. If you do not count the hypothetical tactical nuclear weapons use by Pakistan that marks deterrence breakdown as first-use, and instead focus on a possible Pakistani response to an Indian massive retaliation, then this a scenario with two steps: India's retaliation and Pakistan's (possible) counter-retaliation. If you do count the tactical nuclear attack as a first use, then your deterrence calculations should factor the possibility of a third use of nuclear weapons by the adversary, as Menon says it must.

In any case, since India has conventional superiority over Pakistan, the incentives for a true Indian first-use are weak — a basic argument behind India's a no first-use posture. Pakistan's tactical nuclear weapons do not change this

posture. Even if India had the intelligence, surveillance, and reconnaissance (ISR) capabilities needed to detect every Pakistani tactical nuclear system, a tactical nuclear weapons-specific counter-force posture hardly makes sense. Destroying them without degrading Pakistan's strategic nuclear assets would guarantee a Pakistani counter-value response, targeting Indian cities. Indeed, even an all-out conventional attack on Pakistan's tactical nuclear systems may lock India in the same pattern. Therefore, either India launches an all-out preemptive counterforce attack against all Pakistani strategic and tactical nuclear assets — which would be inconsistent with its doctrine and almost impossible to implement — or simply absorbs a Pakistani tactical nuclear strike and launches a massive retaliatory campaign.

India's public nuclear doctrine declares that "Nuclear retaliation to a first strike will be massive and designed to inflict unacceptable damage." Is a counter-force second-strike posture consistent with this? Yes. The standard thinking on Indian nuclear

doctrine makes an implicit equation of the phrase "retaliation [...] will be massive" and "massive retaliation" in the Cold-War sense – city-busting nuclear attacks. "Massive retaliation" and counter-value targeting has been linked since the 1960s when McNamara quantified precisely how much of an adversary's country (specifically its population and resources) needs to be destroyed for the adversary to consider it "unacceptable damage." But such a reading of India's doctrine presumes that Indian policymakers are interested in (or capable of) firmly anchoring the doctrine's language in Western nuclear terminology.

Consider the following: American nuclear jargon makes a careful distinction between a "first strike" and "first use," the former having a strictly counter-force interpretation and the latter denoting the first use of nuclear weapons in a conflict in any way. And yet to suggest that when the Indian doctrine talks about an adversary's "first strike," it only refers to an adversary's first counter-force strike would

be ludicrous.

One Indian strategic expert suggests the use of the phrase “first strike” in the nuclear doctrine “was probably the consequence of a lack of awareness of what “first strike” means.” As Balraj Nagal, a former chief of the Indian Strategic Forces Command put it in a 2015 paper, “[m]assive retaliation to cause unacceptable damage is a term that that is not easily defined, and is open to different interpretations” [emphasis added]. Nagal goes on to describe his conception of “unacceptable damage” – “destroy a large number of counter-value targets to include population centers, industrial complexes, and available counter-force targets” [emphasis added]. The most pessimistic reading of Menon (vis-à-vis India’s nuclear doctrine) suggests that counter-force targeting plays as big a role in Indian nuclear-weapons policy as counter-value ones.

But at the end of the day, it really does not matter what India’s retaliatory doctrine is — a tightly-guarded national secret in any case. Most debates among Indian analysts has centered on whether the threat of a city-busting nuclear counter-attack is indeed credible in deterring Pakistan’s use of tactical nuclear weapons. A common argument against the credibility of a massive counter-value retaliatory threat is that India would hardly start destroying several Pakistani cities if they were to fire a few short-range, low-yield nuclear weapons at Indian forces on Pakistani soil. The danger here is that the Pakistani strategic elite might also start believing this and cross India’s nuclear redlines despite them being clearly laid down.

#### *Hair-Splitting Over a Red Herring*

This brings me back to the role of ambiguity and uncertainty in signaling Indian retaliatory resolve. If India was to signal that it is no longer tied to a strictly counter-value retaliatory posture and that Islamabad would not know of the exact nature of India’s “massive” retaliation, it would enhance and not diminish deterrence. India’s current ISR capabilities are indeed far from being what it needs

to embark on a comprehensive counter-force retaliation. But to publicly signal that India’s retaliatory posture is not tied down to a single option would create further uncertainty in Pakistan’s calculations, all the while staying faithful to the public doctrine. Menon’s book, by accident or design, and Narang’s analysis — ironically enough — have accentuated this uncertainty.

But retaliatory ambiguity can’t be furthered through declaratory statements alone. India will have to publicly demonstrate it is making progress in developing the requisite ISR systems needed for counter-value targeting, along with a controlled increase in the numbers of ‘classical’ counter-force weapons like MIRVs — missiles that have several warheads under their nosecones that could independently strike multiple targets at once. Menon himself makes this point when he writes: “What would be credible is the message India conveyed by how it configures its forces.”

To argue that a counter-value/counter-force mix is inherently more destabilizing than a pure counter-value posture is also incorrect. Once Pakistan uses a single tactical nuclear weapon against India there will be a use-it-or-lose-it pressure on Pakistan to safeguard its other strategic assets irrespective of what it perceives to be India’s retaliatory options. This pressure would, paradoxically, increase if Pakistan perceived that India will launch a massive counter-value retaliatory attack. In event of India “just” carrying out a massive counter-value strike that destroys all major Pakistani population centers, it would be of little use to the Pakistanis to think that a couple of their sea-launched cruise missiles would retaliate against this near-total destruction of the Pakistani state. It is more likely that Pakistan would use a large fraction of its nuclear weapons at once in a massive first strike, near simultaneously with its tactical nuclear weapons use against India, thereby making its possession — and threat to use — of these weapons irrelevant.

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Not First, but Not Second Either?

Much more serious than whether India's doctrine allows a counter-force posture is the issue of whether India's no first-use policy precludes launch before detonation. A literal reading of the doctrine says it does. But Menon, elsewhere in the chapter on India's a no first-use pledge in his book, calls this into question:

There is a potential gray area as to when India would use nuclear weapons first against another NWS [nuclear weapons state]. Circumstances are conceivable in which India might find it useful to strike first, for instance, against an NWS that had declared it would certainly use its weapons, and if India were certain that adversary's launch was imminent.

It is unclear whether Menon is pointing this out as a problem with the current doctrine or as a loophole within its framework that India could exploit to carry out a first strike. Despite what Indian analyst Ruhee Neog have pointed out as Menon's "highly circumspect language" (in contrast to his assertions about counter-force), Narang seems to be of the opinion that it is a loophole. Indeed, if he is not arguing that Menon is talking about an extant work-around to the public doctrine, his overarching claim — that India is "not content to cede the nuclear initiative to Pakistan" — falls apart. After all, there can't be a first strike if you don't strike first. But independent of this debate, it may be useful to imagine circumstances that may force India to adopt a launch before detonation posture without breaking it's no first-use pledge completely.

One circumstance is when Pakistan has already launched a strategic nuclear weapon and India does not have the ability to intercept or otherwise prevent a nuclear attack on its soil. The public doctrine states: "Nuclear retaliatory attacks can only be authorized by the civilian political leadership through the Nuclear Command Authority." If the incoming strategic missile happens to be part of a decapitation strike aimed at the political leadership, then it is possible the prime minister will indeed authorize a retaliatory launch before detonation of the incoming. But the

need to prepare for a retaliatory launch before impact is independent of whether Pakistan has – or seeks to use – battlefield nuclear weapons.

While India is quickly moving towards completing the sea leg of its triad, with the induction of the SSBN Arihant inducted into the navy last year, Indian nuclear doctrine currently prohibits submarine commanders to launch nuclear missiles without express political authority. The very short flight time for an incoming missile from Pakistan to India — "5 minutes," exclaimed A.Q. Khan recently — exacerbates this problem. So, the Indian leadership will either have to pre-delegate launch authority to ensure not just physically-survivable but functional second-strike capability to the military in the event of a serious crisis or move towards what the Russian Strategic Rocket Forces call a "retaliatory offensive strike." This is defined as a "form of responsive measures [...]" so that the transmitting of launch orders to a major portion of delivery systems and the launch of those systems are carried out before the first impact." While such a stance would move India towards a more qualified no first-use pledge, it would be driven by the need to secure a second-strike ability rather than carry out a preemptive nuclear attack on Pakistan as Narang contends.

Source: <https://warontherocks.com/>, 29 March 2017.

#### **OPINION- Shashank Joshi**

### **India's Nuclear Doctrine Should No Longer Be Taken For Granted**

In recent years, a debate over India's nuclear doctrine – how and when it plans to use nuclear weapons – has rekindled. The issue was raised in the BJP's 2014 manifesto, then by a couple of former heads of India's Strategic Forces Command (SFC), and most recently by former defence minister Manohar Parrikar, all of whom urged changes to one or other aspect of India's last published doctrine of 2003. In past weeks, attention has turned to former National Security Advisor Shivshankar Menon's book Choices, which points to two important changes.

One, which I discussed in a review of Menon's

book in India Today in December, is that India 'might find it useful to strike first' if, for instance, 'an adversary's launch was imminent'. Were Indian doctrine to embrace this possibility of pre-emption, it would mark the end of the country's 'no first use' (NFU) pledge. But Menon's second point, highlighted by MIT professor Vipin Narang in recent days, is even more important.

'The logical response at first was counter-value targeting', writes Menon, referring to a strategy of directing nuclear strikes at an enemy's population in towns and cities, 'rather than counter-force targeting', which refers to aiming at their nuclear forces. Menon implies that, as time has passed, India's position has changed:

India would hardly risk giving Pakistan the chance to carry out a massive nuclear strike after the Indian response to Pakistan using tactical nuclear weapons. In other words, Pakistani tactical nuclear weapon use would effectively free India to undertake a comprehensive first strike against Pakistan.

A comprehensive first strike typically refers to a nuclear strike aimed at eliminating the other side's nuclear weapons, with the aim of limiting the damage they can inflict on you. In Cold War jargon, this is known as a 'splendid' first strike. Now, consider a scenario where Pakistan seeks to use tactical nuclear weapons against an invading Indian army, as per its own stated doctrine. If we take Menon's two points together, the implication is that India would not only aim to pre-empt Pakistan's use with its own nuclear weapons, but also that, whether or not this pre-emption succeeded, India would look to inflict a massive strike to take out every available Pakistani weapon. If Pakistan goes first, and India goes second, why should India leave Pakistan with the ability to go third? Indeed, if Pakistan is trying to go first, why doesn't India simply slip in first? These twin ideas, striking first and aiming at the enemy's nuclear weapons rather than his cities, are intuitive and alluring. But they also carry three types of serious risk.

One is that first use doctrines are highly destabilising, giving each side an incentive to pre-

empt the other lest they be disarmed entirely. If India waits too long, it risks allowing Pakistan not only to destroy Indian tanks but, more worryingly, to disperse and conceal the longer-range weapons aimed at Indian cities. But if Pakistan thinks India will move quickly, Pakistan has an incentive to go even quicker, and to escalate straight to the use of the longer-range weapons. One could argue that this is beneficial to India, since it deprives Pakistan of the opportunity to wage a limited nuclear war, and therefore renders its whole strategy less proportional and less credible. But given the short aircraft and missile flying times involved between India and Pakistan, this reciprocal fear of first use could pull each side in the direction of placing nuclear forces on hair-trigger alert. This risk is higher for Pakistan, given its smaller landmass and India's long-term advantage in nuclear surveillance and targeting.

Second, an Indian counter-force doctrine – the threat to target Pakistan's nuclear weapons, rather than its cities – incentivises Pakistan to undertake a massive nuclear build-up, in order to dispel any possibility of India disarming it entirely. Pakistan presently has an estimated stockpile of 130 to 140 nuclear warheads, around 20 to 30 more than India. In 2015, the former head of Pakistan's influential Strategic Plans Division (SPD), Lt. Gen. Khalid Kidwai, said that he was 'more or less okay' with the planned numbers for the next decade or so.

Pakistan has never taken India's NFU pledge seriously, so any Indian shift there is probably priced into Pakistan's numerical requirements. But a perceived shift to counterforce could prompt Pakistan to upgrade its numbers of delivery systems, dramatically. This in turn would increase the number of targets for India, and so the required number of Indian warheads. The risks of an arms-race cycle, of the sort that both India and Pakistan have repeatedly disavowed, are self-evident. It would certainly mark the death of India's doctrine of credible minimum deterrence, because there would be nothing minimum about it. Of course, India might argue that forcing Pakistan into a costly nuclear build-up will divert money from conventional arms and can ultimately bring

Islamabad to its knees. But India's nuclear burden would also spike, while China could bail out Pakistan.

The third problem with this doctrine would be that it turns what is the risk of losing Indian cities into a guarantee of losing Indian cities. India cannot now, or in the medium-term, eliminate Pakistan's nuclear arsenal. Doing so would require extraordinary capabilities to locate and track a large number of concealed, dispersed, and mobile delivery systems across the landmass of Pakistan and – perhaps in the future – at sea.

However quickly Indian satellites may be maturing, this is a step too far. India can of course target some Pakistani weapons, while stopping others through missile defence, thereby limiting the potential damage to India. But some will survive. And if India takes the fatalistic approach of assuming that a nuclear exchange must be absolute, then Pakistan is left with no incentive to hold back either. Here, the optimist may retort that this bleak conclusion will stay Pakistan's hand in the first place, deterring any nuclear use and allowing India to leverage its larger conventional numbers. But this would be to underestimate Pakistan's existential view of the stakes in conventional war.

For nearly 15 years, India's stated nuclear doctrine has been to shun first use, emphasise massive retaliation over flexible and limited nuclear responses, and look to counter-value rather than counterforce targets. The whirl of debate around each of these three precepts is indicative of the fluid, elusive nature of nuclear strategy, as well as a more uncertain security environment and

growing confidence in Indian capabilities. In taking aim at each one of doctrinal pillars, albeit in language that is caveated and cautious, Menon is indicating that Indian nuclear doctrine should not be taken for granted, whether by Pakistan or China. His arguments are more likely a warning, than an indication of imminent shifts. But a threat to pre-empt and target Pakistani nuclear weapons is a false

promise, and one that is fraught with serious risks. If it comes to be seen as India's long-term objective, it could produce greater instability in a crisis, a more aggressive Pakistani arms build-up, and needless escalation once nuclear weapons have been used.

Source: <https://www.lowyinstitute.org/>, 22 March 2017.

**OPINION- Ellen Powel**

**Westinghouse Bankruptcy: What does it Mean for US Nuclear Power?**

One of the biggest players in the nuclear power game has taken a step back, raising questions about the future of nuclear power in the US. Westinghouse Electric, Toshiba's nuclear unit in the US, filed for Chapter 11 bankruptcy. As part of its bankruptcy restructuring, the Pennsylvania-based company plans to stop installing reactors in order to focus on maintenance and design, a decision that throws into doubt the future of four reactors that are under construction.

For some, the challenges are a sign of systemic problems that mean nuclear power generation should be phased out. The Westinghouse

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bankruptcy “is a powerful signal of the end of the fantasy of a nuclear revival,” writes Daniel Hirsch, director of the Program on Environmental and Nuclear Policy at the University of California, Santa Cruz, in an email to The Christian Science Monitor.

Others see the bankruptcy filing as another short-term challenge to a beleaguered industry, but they predict a nuclear resurgence down

the line. “The Westinghouse bankruptcy is a setback, but I expect it will only be a temporary setback,” writes Steven Biegalski, director of the Nuclear Engineering Lab at the University of Texas at Austin, in an email to The Christian Science Monitor. “The US and world need nuclear power to meet the global growth in demand for electricity.” Westinghouse is responsible for technology used in about half of the world’s nuclear power plants. When Toshiba purchased the company for \$5.4 billion in 2006, it expected Westinghouse to be a lucrative sideline to its consumer electronics business. But delays on the four nuclear reactors it was constructing in the US, combined with increased regulation after the Fukushima nuclear accident in 2011 that forced changes to reactor design, left the company in the red.

Nor is Westinghouse the only struggling nuclear player. General Electric has also scaled back its nuclear development, while France’s Areva is restructuring, The New York Times reported.

Critics have long been concerned about the risks associated with nuclear power, chiefly the potential for accidents and production of radioactive waste. The Westinghouse bankruptcy reinforces that cost is also a concern, says M.V. Ramana, a professor at the University of British Columbia in Canada. “This is the fundamental challenge that nuclear power has faced for the past several decades,” he tells the Monitor in a

phone interview, arguing that nuclear power is “unable to compete economically in the electricity marketplace.” Nor are the construction cost overruns and time delays that have plagued the Westinghouse projects unique to the US, he adds.

**Nor is Westinghouse the only struggling nuclear player. General Electric has also scaled back its nuclear development, while France’s Areva is restructuring.**

These observers suggest that it is time for the US to focus its attention on renewable energy sources, including wind and solar. But others take a more

optimistic view of nuclear energy’s long-term potential, saying the current challenges can be addressed.

That may start with strengthening domestic industry. Before Westinghouse signed on to the four nuclear projects in 2008, no new nuclear plants had been built in the US since the Three Mile Island accident in 1979, and Westinghouse’s contractors’ lack of expertise seems to be largely responsible for costly delays. “It was clear early on that the US had lost much of its skilled workforce needed to build the power plants,” explains Paul Dickman, who is on the board of directors of the American Nuclear Society and is a retired senior official at the Nuclear Regulatory Commission, in an email to the Monitor. “Lack of

experience on all sides was certainly a factor and there were many issues that had to work themselves out.”

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And while the upfront costs of nuclear installations may still concern energy companies, Dr. Biegalski notes, nuclear may look

more appealing down the road. “In the short-term, the low cost of natural gas in the US and subsidized solar and wind create an energy market where nuclear does not shine as well as it should,” he writes. “However, it is expected that the low cost of natural gas and the solar and wind subsidies are not long-term features of our market.” Investors may not be so easily swayed, however. As Dr. Carey King, an assistant director at the Energy Institute at the University of Texas

at Austin, tells the Monitor in an email, wind and solar “can be installed in smaller increments, putting less total capital at risk at one time.”...

But Professor Ramana says nuclear may not need to be part of the mix. Since each renewable source is productive at different times, it should be possible to produce a blend of renewable energy sources that “compensate for [each other’s] intermittencies,” he suggests.

Source: <https://www.csmonitor.com/>, 31 March 2017.

**OPINION - Toby Dalton and Jon B. Wolfsthal**

**Can Trump Stop Kim Jong Un?**

Secretary of State Rex Tillerson is in Asia this week on his first major trip abroad—and he’s walking into the most acute nuclear threat America and its allies face: North Korea. As ExxonMobil CEO, Tillerson was used to difficult negotiations with authoritarian leaders, but Kim Jong Un presents an entirely different sort of challenge—a dangerous leader now armed with nuclear weapons who threatens his neighbors and regional and even global stability. This is the big leagues of international diplomacy and security.

Last week, the reclusive regime in Pyongyang fired off a salvo of medium-range ballistic missiles into the Sea of Japan, further demonstrating its growing nuclear potential. The pressure on the Trump White House to take some kind of remedial action—punitive, defensive or transactional—to deal with North Korea grows apace.

The reason these tests are so worrisome is because at some point in the not-too-distant future, North Korea will be able to put a nuclear warhead on a long-range missile and brandish it

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against the United States. President Donald Trump has already drawn a red line, flatly declaring, “It won’t happen.” So far, the US has delivered an anti-

ballistic missile system to South Korea and leaned on the Chinese to lean on Kim, but the White House has yet to outline any kind of a strategy for stopping him.

None of the options available to Trump are attractive, but several are fraught with dangerous side effects. The worst ideas would spark an armed conflict or undermine South Korea’s confidence in US security guarantees, potentially pushing Seoul to develop its own nuclear weapons.

The White House policy review on North Korea apparently is assessing all options, ranging from negotiations to preemptive military action. Good. Direct engagement is always worth considering, especially for a new team. And with Beijing seemingly on board with tighter sanctions on Pyongyang—if the recent announcement of a Chinese cutoff of coal purchases is real—the combination of international economic pressure and talks is surely worth considering.

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But the temptation to do “something” should not blind American officials or experts to the very real risks of negotiating anything short of a comprehensive

agreement. A temporary freeze on missile and nuclear developments sounds better than an unconstrained and growing threat. It is also, possibly, the most logical and necessary first step toward an overall agreement between the US and North Korea. But the risk that North Korea will cheat or hide facilities during a negotiated freeze is great. And any deal negotiated without full buy-in from Seoul and Tokyo could leave US allies feeling increasingly vulnerable to US policy whims. This is one reason the North Korea problem is so complex: The US must consider not just its own security needs, but those of Japan and South Korea.

The politics of any deal with North Korea are especially tricky in Seoul, now facing a presidential

election and an uncertain redirection in policy toward the North. Recent South Korean President Park Geun-hye was impeached over a corruption scandal involving one of her top aides. A new president might not be elected until early May, paralyzing the country's foreign policy just as Tillerson and Trump are trying to engage the region. At the same time, there is growing support in South Korea for developing a nuclear capability to counter North Korea—the result of a number of military, political and sociological factors, not the least of which are concerns about the reliability of the United States as a security provider. Seoul's security officials also fear US direct negotiations with the North that would undercut American security commitments, or leave South Korea on the outside looking in.

Reassuring nervous allies is very difficult, perhaps tougher than deterring obstinate adversaries. It's already hard enough for Washington to meet South Korea's demands for protection. Over the past dozen years, careful effort to strengthen the US-Korean alliance has resulted in a bilateral security relationship that many American and Korean experts judge to be the strongest in decades. Yet nervous South Korean officials want more—including the stationing or regular rotation of US "strategic assets" (read: aircraft that can deliver nuclear weapons) on the Korean Peninsula and enhanced participation in US nuclear planning. Suggestions that America redeploy tactical nuclear weapons in Korea are never far away.

One way Tillerson will be successful is if he uses his visit to Seoul to understand why South Koreans are fearful and how US policy eases or exacerbates these fears. He'll also have to know when it's safe to disappoint them. Seeking a negotiated "freeze"

on North Korean development of long-range missiles, for instance, would reduce US exposure to North Korean nuclear weapons, but also would consolidate the nuclear threat South Korea already faces. This is unavoidable. Yet, taking action to prevent Pyongyang from developing capabilities to threaten the US mainland with nuclear weapons should strengthen the credibility of US commitments to come to South Korea's defense in the event of hostilities on the Peninsula. Tillerson will need to reassure South Koreans that a freeze can be in both Seoul and Washington's interest so long as it does not come at too high a price. That is why North Korea's proposed trade of a nuclear freeze in exchange for an end to US-South Korea military exercises should be unacceptable.

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So what should Trump do? The best approach—unsatisfying as it may be—is to ensure that any negotiations with North Korea not only rely on Chinese leverage, but are accompanied by a regular and sustained effort to convince South Koreans of the durability of US security commitments. In this way, the Trump administration can evaluate the costs and benefits of competing approaches while keeping the big picture in mind. Another way of stating this is that the US must align short-term tactics with

long-term regional strategy. Actions, real or perceived, that diminish the security of US allies could over the long term result in a region in which all of the actors have nuclear weapons. Avoiding that dangerous future must be a major US foreign policy goal.

North Korea has nuclear weapons, something that won't change anytime soon. As bad as this is, recognizing that status in a way that paves the road for South Korea to follow suit would be

even worse. This is a risk the Trump administration will have to confront, and it should not do so blindly.

*Source: Toby Dalton is co-director of the Nuclear Policy Program at the Carnegie Endowment for International Peace. Jon B. Wolfsthal is a former senior White House official and non-resident scholar at Carnegie, <http://www.politico.com/>, 15 March 2017.*

## NUCLEAR STRATEGY

### USA

#### US Leads Boycott of UN Talks to Ban Nuclear Weapons

US Ambassador to the UN Nikki Haley announced that the US and almost 40 other nations would not participate in the first-ever talks on an international treaty to ban nuclear weapons. Flanked by ambassadors from about 20 nations, including nuclear powers United Kingdom and France, Haley couched the decision not to attend the talks, which began Monday, in personal terms.

President Barack Obama's administration also opposed the talks, which the General Assembly voted to approve in December 2016, and nuclear powers Russia and China also are not taking part. United Kingdom Ambassador Matthew Rycroft said his country also would not attend the talks because "we do not believe that those negotiations will lead to effective progress on global nuclear disarmament." President Donald Trump told Reuters last month that he would prefer a nuclear-free world, but otherwise the United States should be "at the top of the pack." The boycott drew criticism from backers of the treaty, who called it "an unhelpful distraction."...

*Source: <http://edition.cnn.com/>, 28 March 2017*

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## BALLISTIC MISSILE DEFENCE

### US-JAPAN

#### Japan to Set Priority on Missile Defense in Security Talks With US

Japan plans to propose that priority be placed on discussions on reinforcement of ballistic missile defense during a security dialogue with the US expected to be held late April 2017 in the wake of recent missile activities by North Korea, a government source said...

The two countries' foreign and defense ministers may discuss their division of roles including whether to have US capabilities in place to destroy an enemy military base before a ballistic missile launch, according to the source.

...On 06 March 2017, North Korea launched four ballistic missiles, three of which fell into Japan's exclusive economic zone in the Sea of Japan. The missiles were viewed as possessing an increased strike accuracy based on how closely they flew. Japanese PM Abe and Trump agreed the following day that the North's test-firing of ballistic missiles was a "clear challenge" to the international community.

North Korea conducted two nuclear tests and more than 20 ballistic missile tests in 2016 and its leader Kim Jong Un claimed in a New Year's address that the country was ready to test-fire an intercontinental ballistic missile, which could reach the US mainland. As part of the bolstered ballistic missile defense, the Japanese government is considering additionally deploying an Aegis vessel equipped with the Standard Missile-3 interceptor system....

*Source: <http://mainichi.jp/english/articles/>, 26 March 2017.*

US- SOUTH KOREA

Seoul, Washington, Tokyo Begin Missile Defense Drill

The navies of South Korea, the US and Japan began a joint missile detection exercise in a bid to boost trilateral military cooperation in detecting and tracking North Korean missiles. The ROK Navy said the two-day drill was being held in South Korean and Japanese waters.

**The trilateral naval drill is separate from the ongoing joint annual Foal Eagle and Key Resolve exercises by Seoul and Washington, the Navy noted. The exercise is designed to train sailors to share information on detecting and tracking enemy missiles, the Navy said, adding that the missile interception part was excluded from this drill.**

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During the simulation exercise, three Aegis-equipped destroyers – the Sejongdaewang from South Korea, Curtis Wilbur from the US and Kirishima from Japan – were mobilized. “The Aegis destroyer from each country detects and tracks a mock hostile missile as if fired by the North, and then exchanges relevant information among them,” the Navy said. “The drill is taking place in accordance with an agreement, made at the Seoul and Washington’s Security Consultative Meeting in October 2016.”...

...However, the Navy said that the Aegis destroyers of the two countries would not share information directly during the drill, but would do so indirectly through US satellites. “As the GSOMIA has been signed, South Korea and Japan are making efforts to interlock systems of their Aegis destroyers so that their information-sharing ability can be improved,” a

Navy official said. The official added that the trilateral drill was unrelated to the US-led missile defense system (MD), playing down speculation that Seoul could drift into Washington’s global missile defense program. Japan officially announced its participation in the US MD in 2003.

...Officials said sending the Carl Vinson Strike Group demonstrated US intent to deter North Korea amid tensions surrounding Pyongyang’s evolving

missile and nuclear weapons programs. The reclusive state fired four ballistic missiles on Mar. 6, 22 days after it fired a new intermediate-range ballistic missile. There has also been speculation that Pyongyang will stage another major provocation such as a sixth nuclear test or launching an intercontinental ballistic missile aimed at the US mainland.

Source: <http://www.koreatimes.co.kr/>, 28 March 2017.

NUCLEAR ENERGY

CHINA

China General Nuclear Vows to Meet New Deadline for World’s First EPR Reactor

**The Taishan project incorporates so-called “third-generation” European Pressurised Reactor (EPR) design, which is touted by French technology supplier Areva as being more cost-efficient and safer than the widely adopted second-generation designs.**

China General Nuclear Power Corp (CGNPC), the parent of listed CGN Power, is “very confident” it will meet the twice delayed commercial commissioning timetable for the world’s first nuclear reactor to be built using an advanced

French technology, according to its spokesman...State-owned CGNPC is the world’s largest nuclear power projects developer by projects under construction, and the fifth largest when ranked by operating capacity. The Taishan project incorporates so-called “third-generation” European Pressurised Reactor (EPR) design, which

is touted by French technology supplier Areva as being more cost-efficient and safer than the widely adopted second-generation designs.

Huang Xiaofei, spokesman, CGNPC

Hong Kong-listed CGN Power said in late 2015 that the expected commercial operation of the first generating unit at Taishan had been delayed from the first half of last year to the first half of this year, after a "comprehensive evaluation" of the construction plan and risks. The second unit's time frame for commercial generation has also been delayed to the first half of next year. The project was originally expected to come on line in 2015. Construction delays raise project and depreciation costs and crimp profitability. Huang said it is in line with engineering "norms" that first-of-its-kind projects and products are prone to "some schedule slippages." ...Areva's rival, US-based Westinghouse, which claims its technology is the basis for almost half the world's operating nuclear power plants, has also supplied its version of third-generation technology to China as well as the US and South Korea.

The world's first Westinghouse AP1000 third-generation reactor is expected to start commercial operations this year in Sanmen, Zhejiang province. That project is also some two years behind the original schedule. Despite the delays, Huang said the Taishan plant has progressed faster than the other two ERP projects being built. Construction on one in Finland began in 2005 while the other, in France, started in 2007.

...The British government has been closely monitoring the progress of the Taishan reactor, which is seen as a reference project for the 18 billion pound Hinkley Point EPR plant to be built in southwest England, in which CGNPC has a 33.5 per cent stake.

The British government has guaranteed that the wholesale power price of the project will not be

less than 92.5 pounds per mega-watt-hour, a reflection of nuclear power's competitiveness compared to clean energy alternatives such as wind and solar power, Huang said.

CGNPC has been providing staff training to Thailand, Kenya, Malaysia and Indonesia, all of which have expressed interest in buying the Hualong reactors designed by CGNPC, rival China National Nuclear Corp and their Chinese engineering partners...Exporting its nuclear equipment and expertise is a key plank of China's economic strategy, since an advanced nuclear power plant can generate economic value equivalent to that of 200 commercial aircraft valued at US\$50 million each, he added....

**He said for the first time, the Nuclear Power Corporation of India has been allowed to go for setting up of joint venture nuclear plants along with Public Sector Undertakings. The Minister said the third stage of India's nuclear power programme contemplates using thorium along with uranium-233 as fuel in thorium-based reactors.**

*Source: South China Morning Post, 26 March 2017.*

## **INDIA**

### **Govt Sets Target to Triple Nuclear Power Generation By 2024**

Nuclear power generation capacity in the country is expected to reach nearly

15,000 MW by 2024 as the government has expedited the process of setting up new plants, Lok Sabha was informed on 22 March 2017...

Minister of State for PMO Jitendra Singh said a number of steps have been taken by the Narendra Modi government to fast-track all ongoing nuclear projects and setting up of new plants in different parts of the country...Singh said the government was actively pursuing the process of acquiring uranium from different sources, including exploration in new places like Bihar and Meghalaya.

He said for the first time, the Nuclear Power Corporation of India has been allowed to go for setting up of joint venture nuclear plants along with Public Sector Undertakings. The Minister said the third stage of India's nuclear power programme contemplates using thorium along with uranium-233 as fuel in thorium-based reactors.

With sustained efforts of years, India has gained experience over the entire thorium fuel cycle on a semi-industrial scale, he said. "The developmental activities include studies in thorium extraction, fuel fabrication and irradiation, reprocessing studies including construction of an engineering-scale power reactor, thorium reprocessing facility and setting up of uranium-233 fuelled Purnima and KAMINI research reactors," he said....

*Source: Indian Express, 22 March 2017.*

## **INDIA-RUSSIA**

### **Russia Strongly Backs Indian Entry to Nuclear Suppliers Group**

Russia strongly supports Indian membership of the Nuclear Suppliers Group (NSG), Mikhail Ulyanov, Director of the Russian Foreign Ministry's Department for Non-Proliferation and Arms Control, said in New Delhi on 23 March 2017.

"India will become a member of the NSG

because it complies with all criteria for participation in this association," Ulyanov said at a lecture titled 'India-Russia Partnership and Prospects for Non-Proliferation and Arms Control,' which was delivered at the Foreign Service Institute at the old JNU campus. "First, India has considerable potential in the sphere of the peaceful atom," the Russian diplomat said. "Secondly, they have a pretty good working system of nuclear control. This is a necessary condition for membership in the NSG."

...Ulyanov added that Russia backed India's successful entry to the Missile Technology Control Regime (MTCR), a voluntary partnership among 35 countries that was set up to prevent the proliferation of missile and drone technology capable of carrying above 500 kg payload for more than 300 km....

*Source: <http://in.rbth.com/>, 24 March 2017.*

## **INDIA-USA**

### **Indo-US Civil Nuclear Pact Likely To Miss June Deadline**

Bankruptcy of reactor maker Westinghouse clouds operationalisation of the deal. More than two years after India and the US announced that the civil nuclear deal was "done," its actual operationalisation is in doubt over a number of developments that stretch from a "school scandal" in the Japanese parliament in Tokyo to the Cranberry, Pennsylvania headquarters of Westinghouse Electric, which is expected to file for bankruptcy this week.

*Six reactors for A.P.*

According to the agreement over liability issues and the negotiations that followed former US President Obama's visit to India in January 2015 and PM Modi's visit to Washington in June 2016, the two sides had agreed to "work toward finalising the contractual arrangements by June

2017" for six reactors to be built in Andhra Pradesh by Toshiba-owned Westinghouse and the Nuclear Power Corporation of India Ltd (NPCIL).

When completed, this was to be the first operationalisation of the Indo-US civil nuclear deal, which was announced in 2008, and proof that both sides have effectively sorted out all their issues, including over the liability that suppliers must accept in the event of an accident.

However, recent developments have led to uncertainty over the June 2017 timeline. An MEA official told The Hindu, "We are monitoring all developments. We are engaged with all parties. Our intent is to stick to the deadline, for which competitive financing arrangements need to be in place. It must be emphasised that the outlook of global industry on cooperation in India's civil nuclear programme remains positive."

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The reason for the concern is that the Indo-US nuclear arrangement hinged on two major factors — the completion of the India-Japan Nuclear Cooperation Agreement (NCA), as Toshiba and other suppliers for reactor parts are bound by Japanese laws and by the actual contract to be negotiated by the US-based Westinghouse.

While the NCA was signed in Tokyo in November 2016, it is yet to be ratified by the Japanese Diet (Parliament). Japanese officials told The Hindu that the NCA was expected to have been ratified in early March during the current session, but has been derailed by a controversy over accusations that PM Shinzo Abe, his wife and the Defence Minister Tomomi Inada favoured an alleged “sweetheart deal” for a school in Osaka. With lawmakers stopping all other business to discuss the issue, Mr. Abe’s stock in opinion polls and the Nikkei index have registered sharp drops in the past weeks. “Even once the India NCA is tabled, we expect to see some opposition in Parliament, as this is the first such agreement with a country that has not signed the NPT,” said an official.

Source: Suhasini Haider, *The Hindu*, 27 March 2017.

### **Nuclear Bids on Track, Says Westinghouse**

Westinghouse’s operations in Asia will not be affected by its decision to file for bankruptcy in America, the nuclear power company that is in talks to set up six reactors in India, said on Wednesday. “We are continuing with our India bids,” Sarah Cassella, External Communications Manager of the company told The Hindu by email. Ms. Cassella did not respond to a question on the possibility of the talks between the company and Nuclear Power Corporation of India Ltd. (NPCIL) meeting a June deadline for conclusion.

“Westinghouse’s operations in its Asia and Europe, the Middle East and Africa (EMEA) Regions are not impacted by the...filings. Customers in those regions will continue to receive the high-quality products and services they have come to expect in the usual course,” the company said in a statement. The company has obtained \$800 million in debtor-in-possession (DIP) financing from a third-party lender to help fund and protect

its core businesses. Asian operations will also benefit from this financing, the company said.

### *Reorganisation Plan*

“Today, we have taken action to put Westinghouse on a path to resolve our AP 1000 financial challenges while protecting our core businesses,” said Interim President & CEO José Emeterio Gutiérrez. “We are focused on developing a plan of reorganisation to emerge from Chapter 11 (bankruptcy) as a stronger company while continuing to be a global nuclear technology leader.”

AP 1000 is the pressurised water reactor design developed and owned by the company. Westinghouse has been in talks with the NPCIL to build six AP 1000 reactors in Andhra Pradesh. This was the first commercial agreement to be concluded under the India-US civil nuclear deal signed in 2008. While the U.S government has

also taken the view that bankruptcy filing will have no impact on the ongoing commercial negotiations, India has taken a benign view of the developments.

Source: Varghese K George, *The Hindu*, 31 March 2017.

**Abe has repeatedly said that resource-poor Japan, the world’s third-largest economy, needs nuclear power and has pushed to get reactors back into operation despite public anxiety.**

### **JAPAN**

#### **Japan High Court Rules Nuclear Reactors Can Restart**

A Japanese appeals court on 28 March 2017 ruled that a pair of nuclear reactors halted by a lower court order can be restarted, in a victory for PM Shinzo Abe’s energy policy.

Japan shut down all of its reactors after the Fukushima nuclear crisis in 2011, relying on imported fossil fuels to power its economy. Due to public opposition, only a handful have since been restarted. But Abe has repeatedly said that resource-poor Japan, the world’s third-largest economy, needs nuclear power and has pushed to get reactors back into operation despite public anxiety.

...the Osaka High Court in western Japan struck down an injunction by a lower court that had forced the two reactors to shut down over safety

concerns. At issue were the No. 3 and No. 4 reactors at the Takahama nuclear plant in Fukui prefecture, some 350 kilometres (215 miles) west of Tokyo. A lower court in a city adjacent to Fukui ordered Kansai Electric Power (KEPCO) in March last year to suspend their operation, spurring the utility to appeal to the Osaka High Court....

Source: <http://www.thestar.com.my/>, 28 March 2017.

## **PAKISTAN**

### **Work On Two Nuclear Power Projects in Karachi in Full Swing**

Work on two Karachi Nuclear Power Projects (K-2 and K-3), with total capacity of producing 2200 megawatts of electricity, is underway. These power plants are being constructed in cooperation with China under China-Pakistan Economic Corridor (CPEC) at a cost of over 9 billion dollars. Officials said besides these power projects, the work on 1320 MW coal-based power plants at Port Qasim in Karachi, and 1320 MW coal-based power project in Thar coal field is also underway.

Source: <http://dailytimes.com.pk/>, 25 March 2017.

## **UK**

### **Foreign Companies Flock to Build Nuclear Plants in the UK**

Nuclear energy faces an uncertain future globally as concerns over safety and cost dog the industry. But in the UK, foreign investors are queueing up to back projects. The latest is South Korea. Its biggest power company is in talks to join the consortium backing a nuclear power station in Cumbria, in a sign of the continuing allure of

Britain's atomic ambitions to international companies. Kepco said last week it was interested in taking a stake in NuGen, which is 60% owned by Japan's Toshiba and 40% by France's Engie, confirming what had been an open secret in the industry for months.

Kepeco's president, Cho Hwan-eik, said that once the terms of a potential

deal were ironed out, "we will be the first to jump into the race". The idea of a Seoul-based company developing the Moorside plant near Sellafield is not as strange as it might seem. The UK government needs new nuclear power stations to meet greenhouse-gas reduction targets and keep the lights on as ageing coal and atomic plants are retired. This month, officials reiterated how important nuclear will be to Britain's future energy security, with projections that showed 38% of

power coming from nuclear by 2035, up from 24% last year.

Potential investors have been drawn by the UK government's enthusiasm and a nuclear standstill elsewhere, amid lingering safety fears in the wake of the Fukushima disaster and cost overruns at the Flamanville site in France

which is using a new reactor design. As a result, South Korea has joined Japan, China and France in showing interest in British nuclear...

One expert, Mycle Schneider, called the UK the "last hope" for the nuclear construction giants of the world. The Paris-based nuclear consultant said: "In Korea the political situation will dramatically change after the upcoming elections, [probably] not in favour of the nuclear industry. Success overseas will help survival at home. The Japanese industry clearly has no future at home and little prospects abroad [because of Fukushima]."

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The UK has also dangled the prospect of economic support for foreign nuclear builders. French state-owned EDF, which is building two new reactors at Hinkley Point in Somerset at a cost of £18bn, struck a subsidy contract with the government that will see it guaranteed twice the wholesale price of electricity for 35 years. The deal means Hinkley would be an “absolute goldmine” when operational, Atherton said. He said UK financial support was not dissimilar to the deal Kepco has in the United Arab Emirates, where it is building four new reactors paid for by the UAE’s state-owned utility. “The economics of the project, and the economic risks of the project, fall on the host government,” said Atherton. There is also the prospect that the UK government could take a stake in one of the new nuclear sites...

Another lure for foreign companies is the prestige of having their reactor design pass the UK’s strict regulatory and licensing process. Antony Froggatt, a nuclear expert at the thinktank Chatham House, said: “It gives you that important status for getting orders elsewhere.” That is particularly true of the Chinese state-owned company, which is providing a third of the money for Hinkley and whose design for a reactor at Bradwell, Essex is expected to complete the UK regulatory process in 2021. “It would be important because it would be first time that reactor type was built outside China, so having it approved by the UK regulator would be significant,” said Atherton.

Kepco’s motives for the Moorside interest are not yet clear. It may want to get a foothold in the UK and provide the finance to build AP1000 reactors designed by Toshiba subsidiary Westinghouse, with the Office for Nuclear Regulation expected to give clearance for the technology imminently after a four-year process.

But it is thought to be more likely that Kepco would want to build its own South Korea-designed reactors at the site. Froggatt said: “The question

is, does Kepco want to build AP1000s? The answer is no, it doesn’t want to build them. If it went ahead, I assume they’re buying the site and infrastructure. I assume they would put their own reactor through the licensing process.” Kepco has a good recent track record of building reactors abroad. The first reactor in UAE is due to be connected to the grid this year, which Schneider said would be an “outstanding achievement” if achieved. In total, it operates 25 and is building three at home. The UK may

be joining that list.

*Source: Guardian, 25 March 2017.*

## **NUCLEAR COOPERATION**

### **RUSSIA- KENYA**

#### **Russia Eyes Deal to Build Kenya’s Sole Nuclear Plant**

Russia has offered to design, finance and build Kenya’s proposed nuclear power plant...

Russia is seeking to strike a deal through its state-owned Rosatom State Atomic Energy Corporation. Kenya plans to set up four nuclear plants, with the first expected to be switched on in 2027.

On May 30, 2016, Rosatom signed a Memorandum of Understanding with Kenya to promote nuclear solutions, assist in training personnel, create public awareness, and design agriculture and medical solutions. Rosatom regional vice president for Sub-Saharan Africa Viktor Polikarpov yesterday said the Moscow-based entity, through the government, is ready to support Kenya put up its plants on a Build–Operate–Transfer module or Private-Public-Partnership consortium. Rosatom said it will borrow a loan through an intergovernmental agreement, with a repayment period of up to 25 years. The firm is the only reactor vendor in the world that can offer the nuclear industry’s entire range of products and services.

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"We are currently providing the VVER-1200 (Water-Water Energetic Reactor) generation III reactor which is the safest in the world. We can offer the preferred solution to your government if given a chance," Polikarpov told journalists. Cost estimates for new nuclear power plant range between \$4 billion (Sh410.4 billion) per unit to \$9 billion (Sh923.4 billion).

**Kenya plans to generate 1,000 megawatts of power from nuclear energy by 2025 to sustain its socio-economic development. A plant with three or four reactors is capable of producing 3,000MW.**

Kenya plans to generate 1,000 megawatts of power from nuclear energy by 2025 to sustain its socio-economic development. A plant with three or four reactors is capable of producing 3,000MW...Kenya has also signed MoUs with China and South Korea but is yet to identify a developer for the project which could cost up to Sh2 trillion. The developer will be selected by the Kenya Nuclear Energy Board.

The nuclear conference taking place this week will bring together government officials, local and international energy experts, manufacturers and energy utilities. The forum will shed light on Kenya's nuclear power programme and provide a platform for better understanding of its role in the energy mix. Rosatom Africa business development manager Zakhele Madela said: "Kenya's ambitious industrialisation goals need massive energy. Nuclear energy will be the best if you want to secure a base. You cannot continue relying on renewables.

Source: <http://www.the-star.co.ke/>, 14 March 2017.

## **NUCLEAR PROLIFERATION**

### **NORTH KOREA**

#### **North Korea Revs the Engine of Its New High-Thrust Missile**

North Korea conducted a ground jet test of a newly developed high-thrust missile engine, the country's state-run news media said on 12 Marh 2017... even as Secretary of State Rex W. Tillerson is in the region discussing tougher strategies to help end the North's nuclear and missile programs.

The Korean Central News Agency said the test took place at the same northwest facility where the country has been launching rockets to put satellites into orbit, which Western officials have said were efforts to develop an intercontinental ballistic missile. Although North Korea has never flight-tested an intercontinental ballistic missile, it has recently demonstrated

significant progress in its missile programs with new engines that could potentially deliver a nuclear warhead as far away as the US.

...In August 2016, North Korea said it had successfully tested a submarine-launched ballistic missile, after failing on several earlier attempts. Last month, it launched a new type of intermediate-range ballistic missile it said could carry a nuclear payload. And earlier this month, North Korea launched four ballistic missiles at the same time.

Since Kim Jong-un took power in 2011, North Korea has launched 46 ballistic missiles, including 24 last year, in violation of UNSC resolutions, according to South Korean officials.

Source: *New York Times*, 18 March 2017.

## **NUCLEAR NON PROLIFERATION**

### **EU- US- RUSSIA**

#### **EU Wants Further US, Russian Cooperation on Nuclear Nonproliferation - Mogherini**

She added that the EU wants to see similar cooperation between Washington and Moscow on nuclear issues. "The right path is the one marked by the New Start Treaty," Mogherini stated at the Carnegie Endowment for International Peace 2017 Nuclear Policy Conference. Mogherini added that Europe and Russia have also cooperated successfully on nuclear issues, including the 2015 Iran nuclear deal. However, she claimed, a new arms race between the US and Russia would destabilize entire regions and threaten security.

In January 2017, US Secretary of State Rex Tillerson said during his confirmation hearing that

the United States must stay engaged with Russia on the New START treaty and ensure both sides meet their respective obligations...

Source: <https://sputniknews.com/>, 20 March 2017.

## **NUCLEAR SECURITY**

### **INDIA**

#### **India and UN Agency Agree To Train Nuclear Professionals**

IAEA set up in 1957 as the world's 'Atoms for Peace' organization... and the Atomic Energy Commission) of India have agreed on an extended cooperation to the benefit of nuclear professionals from across Asia. IAEA Director General Yukiya Amano and Sekhar Basu, Chairman of India's Atomic Energy Commission, achieved the agreement during the former's three-day visit to India from 13-15 March 2017.

The importance of the agreement derives from the fact that IAEA is world's central intergovernmental forum for scientific and technical co-operation in the nuclear field. It works for the safe, secure and peaceful uses of nuclear science and technology, contributing to international peace and security and the UN's Sustainable Development Goals (SDGs).

The Indian Atomic Energy Commission was first set up in August 1948 in the Department of Scientific Research, which was created a few months earlier in June 1948. The Department of Atomic Energy (DAE) was setup on August 3, 1954 under the direct charge of the Prime Minister through a Presidential Order. Subsequently, in accordance with a Government Resolution dated March 1, 1958, the Atomic Energy Commission was established in the Department of Atomic Energy. The then Prime Minister Jawaharlal Nehru also laid a copy of this Resolution on the table of the Lok Sabha (the lower House of Parliament) on March 24, 1958.

According to the agreement, IAEA-nominated experts in advanced nuclear energy, nuclear

security, radiological safety, nuclear material characterisation and applications of radioisotopes and radiation technologies will be able to use the new training facilities of India's Global Centre for Nuclear Energy Partnership (GCNEP), which are scheduled to open in New Delhi in the near future.

Government of India approved the establishment of GCNEP at village Jasaur Kheri & Kheri Jasaur, near Bahadurgarh, District Jhajjar, Haryana, in September 2010. It is the sixth Research and Development (R&D) unit under the aegis of Department of Atomic Energy (DAE).

...the Centre is purported to promote safe, secure and sustainable nuclear energy through global partnership. The IAEA will be able to use the facilities at GCNEP to train experts from the region and beyond in assisting building capacity. Basu emphasized that India can also provide access to other research facilities to experts from other countries, facilitated through the IAEA. In the area

of cancer care and control, he mentioned that India has donated Bhabhatron radiotherapy machines to several countries in Asia and Africa and would like to work closely with the IAEA to build the associated human resources in these beneficiary countries.

The AEC chairman informed the IAEA Director General that India has established a national grid of more than

100 cancer care centres, staffed with top specialists. With IAEA support, India would be ready to extend this network and convert it into a regional or global network, so that cancer care providers from other countries could also access the expertise available.

Amano acknowledged that India has been a reliable partner of the IAEA in fulfilling its mandate. India's support to developing countries both directly and through the IAEA is extremely important, he said, as the IAEA is receiving an increased number of requests for support from Member States, including small island states, for capacity building....

Source: Devinder Kumar, [http:// www.indepthnews.net/](http://www.indepthnews.net/), 25 March 2017.

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**NUCLEAR SAFETY**

**GENERAL**

**Global Nuclear Safety Meeting Under Way**

The CNS guides participating states operating nuclear power plants to maintain a high level of safety by setting international benchmarks in nuclear installation siting, design, construction and operation, financial and human resources, safety assessment and verification, quality assurance and emergency preparedness. The convention entered into force in October 1996, and has 80 contracting parties. They are required to report on implementation of their obligations under the convention at review meetings held every three years.

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Opening the meeting, IAEA Director General Yukiya Amano reviewed safety initiatives implemented in recent years including the IAEA Action Plan on Nuclear Safety, adopted after the 2011 Fukushima Daiichi accident, and the 2015 Vienna Declaration on Nuclear Safety. "After the Fukushima Daiichi accident, countries with nuclear power programs took vigorous steps to reassess all aspects of safety and some countries reformed their regulatory systems. IAEA activities related to the Action Plan are now being implemented through the agency's regular work," he said.

Amano said the IAEA would continue to focus on regulatory effectiveness, safety culture and capacity-building, and that it would give increased attention to issues such as the safety of radioactive sources used in industry, health care and other non-power applications. He said every country using nuclear technology had a responsibility to create a robust framework for safety and security. "This is a national responsibility that cannot be outsourced. But effective international

cooperation is also essential," he said.

The president of the review meeting, Ramzi Jammal, who is Canadian Nuclear Safety Commission executive vice-president, said increased participation and transparency were his primary objectives for the meeting. For the first time, all national reports will be posted on the CNS public website 90 days after the review meeting, unless specifically requested otherwise. "Our

commitment to transparency can be demonstrated by each contracting party proactively posting their national report, as well as their questions and answers report, on the public CNS website," he said.

He said the meeting would provide contracting parties with a first opportunity to discuss plans and actions following the release of the

IAEA Director General's Report on the Fukushima Daiichi Accident in 2015. The Seventh Review Meeting runs until 07 April 2017...

*Source: World Nuclear News, 28 March 2017.*

**NUCLEAR WASTE MANAGEMENT**

**Off-Site Environmental Remediation in Fukushima Continuing**

Japan's Ministry of the Environment (MOE) updated the status of on-going environmental remediation activities in the areas affected by the accident at TEPCO's Fukushima Daiichi Nuclear Power Station in 2011.

The update was the result of the 2nd IAEA-MOE Consultancy Meeting (Experts' Visit) on Environmental Remediation of Off-Site Areas after the Fukushima Daiichi Nuclear Power Station Accident, hosted by the MOE in Tokyo and Fukushima from 14 to 18 November 2016. The main objective of the meeting

**The meeting would provide contracting parties with a first opportunity to discuss plans and actions following the release of the IAEA Director General's Report on the Fukushima Daiichi Accident in 2015.**

was to provide a forum for discussion for the benefit of Japanese authorities from inputs provided by IAEA staff and experts in order to enhance the ongoing remediation projects.

Japanese authorities also briefed the IAEA on the progress made so that the information can be shared with the international community.

Continued progress with the remediation of off-site areas affected by the accident was observed. Japanese authorities said they expected the completion of the full-scale decontamination project in the Special Decontamination Area (SDA) towards the end of March 2017. They highlighted this milestone as one of the critical steps paving the way to broader lifting of the evacuation order. They added that some municipalities in the SDA had already lifted evacuation orders.

During the meeting, the IAEA and Japanese teams discussed the following topics: Current status of environmental remediation in and around Fukushima Prefecture Volume reduction of the waste materials resulting from environmental remediation Knowledge management on environmental remediation Integration of the overall remediation efforts in the recovery actions Development of waste estimate tool (aimed at predicting the amount of waste to be generated with decontamination works after a radiological emergency or nuclear accident)

Visits to specific locations and ongoing projects were conducted to get a better understanding of the situation. These included visits to the Fukushima Prefectural Government, Date City, the Fukushima Prefectural Centre for Environmental Creation in Miharu Town, the Heat Treatment Facility in Iitate Village, the Interim Storage Facility (ISF) in Okuma Town and TEPCO's office in Koriyama City.

The leader of the IAEA team, Horst Monken-Fernandes, an Environmental Remediation Specialist at the IAEA Department of Nuclear Energy, noted that the Ministry of the Environment, the Fukushima Prefectural Government and other stakeholders have been making efforts to communicate information about radiation with residents through the Decontamination Information Plaza and the Fukushima Prefectural Centre for Environmental Creation. Shoji Nishida, the Mayor of Date City, highlighted that trust between experts and decision makers was essential for timely and effective decision-making during an emergency situation.

*Source: <https://www.iaea.org/>, 16 March 2017.*



Centre for Air Power Studies

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

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