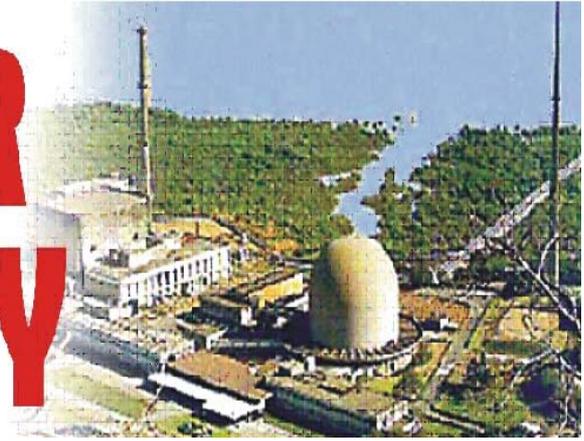


NUCLEAR SECURITY



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OPINION – Abhijit Iyer-Mitra

Long-Term Gain Must be the Aim

The transition in Pakistan has set forces churning which are now more than ever optimal for India to pursue bold measures in the revamp of our missile technology portfolio. We must not lose this opportunity and rue at leisure. The return of Nawaz Sharif brings both opportunities and risks. This first democratic transition in Pakistan has understandably rekindled hope for a meaningful dialogue with India on all outstanding issues including specifically nuclear confidence-building measures. While the new Government in Pakistan is busy devising its foreign and security policy stances – balancing its powers against the Army's pervasive influence – India has seen a renewed debate on nuclear issues. It has been 15 years now since the 1998 nuclear tests and 25 years since the first set of nuclear confidence-building measures were signed between the two countries. The deal signed in 1988 set in place a system, which like the Indus waters accord, has withstood several conflicts unscathed. The deal called for not attacking each other's nuclear facilities and involved a significant leap of faith from both countries which have to exchange a list of their facilities on an annual basis with their exact geographic coordinates.

This deal though has been a one-off. After it came into force in 1991, India had proposed extending this to other areas such as economic and civilian facilities which Pakistan rejected. Since then, India and Pakistan have exchanged several proposals, both specific and generic. All of these have for one reason or another never seen action. For example, when Pakistan asked for a bilateral treaty restricting cruise missiles, India promptly rejected the idea. This was based on the misplaced over-confidence that India was far ahead of Pakistan in this technology. However, owing to certain happy (or unhappy from the Indian point of view) coincidences, Pakistan has stolen a

When Pakistan asked for a bilateral treaty restricting cruise missiles, India promptly rejected the idea. This was based on the misplaced over-confidence that India was far ahead of Pakistan in this technology. However, owing to certain happy (or unhappy from the Indian point of view) coincidences, Pakistan has stolen a significant march over India. Given the evolving nuclear dynamics in the subcontinent, there is an urgent need for immediate measures at least in the sphere of short-range and tactical ballistic missiles.

significant march over India. Given the evolving nuclear dynamics in the subcontinent, there is an urgent need for immediate measures at least in the sphere of short-range and tactical ballistic missiles. There is on one the hand a military need for it and on the other hand an academic and bureaucratic resistance to the idea.

As things stand, India has a policy of massive

retaliation. This is to say, any strike on India or Indian forces – even small sub-kiloton tactical strikes – will theoretically be

responded to with overwhelming force that targets Pakistani cities. The credibility of this threat rests on the fact that it will have to be carried out in its entirety and be overwhelming. On the face of it, this seems logical with built-in pressure alleviation, since it allows conventional action to escalate to significant levels till certain thresholds are crossed. The assumption is that it buys Indian conventional forces the time to carry out significant action. This is based on a reading of Pakistani literature that assumes that Pakistan will wait for some form of imminent defeat before launching a nuclear strike. Sadly, ground realities do not bear out this interpretation. An equally valid point can be made here: Given the huge advantages

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India has, Pakistan's response will be to go in for preliminary tactical nuclear strikes to level the playing field and then engage Indian forces when parity has been achieved.

What this means is that Pakistan is not factoring in India's seriousness of massive retaliation, and India is not factoring in Pakistan's seriousness to launch a first strike. Add short-range ballistic missiles to this, and we have a situation ripe for several mistakes to happen with catastrophic consequences. Short-range nuclear missiles are inherently destabilising and add incredible complexity to a very volatile dynamic. On the one hand, the sides deploying them might find this complexity they offer smart, but in a real shooting war they may very well turn out to have been too-smart-by-half. Logically, the very fact that Prithvis are being deployed runs counter to India's nuclear doctrine, since massive retaliation is quite incompatible with these weapons. Add to this the duty of care to one's troops. Our soldiers are exposed to highly volatile and corrosive rocket fluids while a bulk of these missiles has gone past its expiry date, means that these particular missiles are a bigger threat to India and Indian troops than they are to Pakistan. Yet, despite all this, India which has far more to gain from eliminating short-range missiles, has taken no steps in this direction. In short these missiles are fossils, both in terms of age and in operational terms.

Waiting for and negotiating with Pakistan on such measures is pointless; it outsources our security and the security of our troops to Pakistan. What is needed, therefore, is an immediate and unilateral elimination of these fossils from the inventory. However, their retirement can be turned into a diplomatic asset that turns necessity into virtue. In this scheme of things, unilateral retirement of an anachronistic system can be leveraged to coax Pakistan to give up its own equivalent systems that are the source of said destabilisation. There is, however, considerable opposition to this from within. The scientific bureaucracy believes that these missiles can be re-used and are subjected to vigorous testing. However, as anybody who owns a car will tell you, a 20-year-old machine is simply not worth the trouble and no amount of inspection and repair can fix these systems beyond their use by date.

The second source of opposition comes from academics. They hold the view that India has learnt everything that is

worthwhile from the Cold War experience and that the NATO-Warsaw Pact analogies cannot be duplicated in Asia. This betrays certain arrogance in one's own infallibility. As India's best case scenario interpretation of Pakistan's nuclear stance has shown, the room for misinterpretation here is immense. SRBM elimination – even if it is only a cosmetic measure that piggybacks on a fossil – will yield real and disproportionate benefits in the long-term; and now is the time to get a deal done. The transition in Pakistan has set forces churning which now more than ever are optimal for India to pursue bold measures. The time has come to strike while the iron is hot; else, we stand the risk of being labelled as that country which “never loses an opportunity to lose an opportunity”.

Source: The Pioneer, 18 June 2013.

OPINION – Sierra Rayne

Nuclear Weapons and Tyranny

Despite the clear threats that exist to Israel and other western democracies from a nuclear-weapons-capable Iran, some have argued that parallels between China's development of nuclear weapons during the early through mid-1960s, and Iran's undeniable development of nuclear weapons at present, militate against taking military action against Iran in order to prevent it from developing nuclear weapons. On the contrary, such lessons of history support taking action. We should run the counterfactual regarding China – namely, what may have transpired had Western powers taken military action against China

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during the 1960s in order to prevent this communist police state from becoming a nuclear armed nation? Nuclear weapons have utility for both offensive and defensive purposes. Concerns regarding Iran becoming a nuclear weapons state are not limited the potential offensive use of these weapons. Iran is an authoritarian regime with a very problematic human rights record. China is, and has been for many decades, the equivalent.

When China obtained nuclear weapons between 1964-1967 ... following initiation of their nuclear weapons development program in the early 1950s, this country effectively immunized itself from external actions such as military interventions for humanitarian purposes. What began soon after China's initial nuclear weapons test? The “cultural revolution”... that lasted from 1966 to 1976, in which large numbers of Chinese citizens were killed.

Coincidence? Unlikely. Yes, although there was much public posturing by Chinese leaders (notably Mao Zedong) during the 1950s and 1960s to the contrary, Chinese has not – to date – used its nuclear weapons. This was a risk, though, that must be acknowledged. If a state does not have nuclear weapons, the risk of their being used is zero. If a state does have nuclear weapons, such risks are non-zero. Clearly, a preferable objective would have been the prevention of China's nuclear-weapons capabilities. But we must also think about whether the unnecessary human tragedies of China's Cultural Revolution (and ongoing human rights abuses in that country) could have been – or even, would have been – prevented had China not been allowed to acquire nuclear weapons? Perhaps. And perhaps China would have subsequently democratized had their government not obtained nuclear weapons in the 1960s?

Using this reasoning, we must also extend the logic to Iran. If Iran obtains nuclear weapons, it may use them against other states. But that is not the sole limit of our concerns regarding Iranian nuclear weapons. A nuclear-armed Iranian state will immunize itself against humanitarian-based intrusions on its sovereignty (i.e., any future attempts by the international community to ensure analogous Cultural-Revolution style human-rights atrocities are not committed in Iran). As well, the possession of nuclear weapons by the Iranian leadership may entrench its authoritarian regime against democratic pressures far longer into the future than would perhaps be the case if this nation was prevented from acquiring such capabilities. North Korea is another good example on this point of fact. By this country's possession of nuclear weapons, western democracies are prevented from taking needed humanitarian action in North Korea, and North Korea's evolution into a democratic state may be delayed longer (if not perpetually) than would have otherwise been the case in the absence of a nuclear armed authoritarian regime.

Consequently, a simple parallel historical analysis between the Chinese and Iranian nuclear weapons acquisition programs is incomplete. While the feared nuclear war with China has not yet materialized, that does not mean it never will (i.e., future tensions over Taiwan could spark a nuclear exchange), and regardless, this is not the whole story. In the historical counterfactual, not allowing China to obtain nuclear weapons in the

1960s could have prevented the human rights atrocities of this nation's Cultural Revolution, and could possibly have led to a democratic (and even united with Taiwan) state before the present. Relations between a nuclear-armed China, its own citizens, and the international community since the 1960s have not been as bad as were feared, but they could have been much better had the Chinese nuclear capacity been prevented. These are strong lessons for our current dealings with the Iranian nuclear weapons program, and in the opposite direction to what some others are advocating.

Source: American Thinker, 20 June 2013.

OPINION – Derek H. Burney, Fen Osler Hampson

BMD: The Time is Now for 'Threat Reduction Strategy'

In a turbulent and uncertain world where nationalism and religious zealotry are on the rise, Canada needs to consider actions that will safeguard and advance its national interests. Nowhere is this more true than in the area of nuclear proliferation as states like North Korea and Iran develop these weapons and with them a long range missile delivery capability. A good place to start would be to relaunch discussions with the US for a partnership role in BMD. The most obvious threat at the moment is from the erratic regime in Pyongyang which is desperately pursuing its ambition to deploy a missile capacity capable of striking the US homeland. One may discount the wild rhetoric and clumsy tests

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to date but there is little doubt that North Korea is determined to acquire a capability to threaten North America and hold our cities hostage, however perverse or irrational such a goal might seem to be. Conventional analyses simply do not apply on anything emanating from a government about which so little is known.

Like it or not, given the uncertainties about North Korea's technological prowess, Canada would be as vulnerable as the US Canada would almost certainly be on the flight path of any missile the North Koreans decided to fire at the US should that day come. And there is no guarantee that a missile directed at Washington or New York, or even Seattle or Los Angeles, wouldn't inadvertently land on Toronto or Vancouver. It would be prudent for us to act accordingly and begin to deal with this emerging security challenge now. The infamous Kim dynasty has ruined the

lives of millions of its own people, most of whom, apart from a privileged military and civilian elite, live in brutal, gulag-style conditions denied even the most basic means of livelihood. What little wealth North Korea generates, mostly through illicit drug and arms sales, is squandered heavily on military muscle and advanced weapons technology. What the newest Kim intends to do with its nuclear arsenal, assuming he really is in control, is as unpredictable as it is destabilizing. Even China, its closest neighbor and ally, is increasingly wary about spontaneous combustion on the Korean peninsula. The humanitarian and economic fallout would be devastating and not just in the immediate vicinity.

Canada came very close to signing a BMD agreement with the US in 2004 but backed away at the last minute ostensibly to avoid a renewal of the arms race but more likely because of domestic, political allergies about doing anything on security with the George W. Bush administration. At that time, the former Liberal government of Paul Martin seemed to want a "say" in what was planned but was reluctant to make any kind of hard commitment to participate. As a result, we are on the outside looking in at what had the potential of refitting NORAD to a 21st century threat. (The initial purpose of NORAD was for a different threat in a different age). By standing down we simply became irrelevant. A major priority for any government is the preservation of national security and, if anything, the risk of nuclear proliferation is greater today than it was a decade ago and not just from North Korea, but also countries like Iran, which appear intent on acquiring such capabilities. New initiatives are already underway to quash the threat from terrorists, including the home grown variety. Even more lethal are looming missile threats against which Canada has no practical defense other than to hope that our neighbor will act in its own interest and defend us against an attack, accidental or otherwise.

That is simply not good enough. The best antidote to the antics of North Korea is, as Nicholas Eberstadt contended in the *Wall Street Journal* recently, a "threat reduction strategy," a combination of sustained military and civilian actions and not a repeat of offers of dialogue in the face of "bait and switch" extortion demands from North Korea attempting to gain rewards for bad behavior from all too gullible western powers. A serious effort by Canada to join in BMD could be a constructive and prudent part of

this strategy, complementing our continued support for strengthening the nuclear non-proliferation treaty regime, and would provide us with both a say and a role against missiles from other regimes as well. The time to act in our own security interest is now and a partnership in BMD should be the obvious priority.

Source: Burney is senior strategic adviser for Norton Rose Canada LLP and a former Canadian ambassador to US (1989–1993). Hampson is distinguished fellow and director of global security at the Centre for International Governance Innovation. Daily Times, 22 June 2013.

OPINION – Ali Mustafa

From Non-proliferation to Nuclear Supplier

On May 18, 1974, India conducted its nuclear test. It reaffirmed the international community's fears that nuclear technology and materials, provided for peaceful purposes, can be used in nuclear weapons. In 1975, in order to curtail such gross misuse, Canada, France, West Germany, Japan, Soviet Union, the US and the UK got together and formed the NSG. The purpose was to regulate the nuclear trade so further diversions like India's don't take place. Forty years later the situation has changed. France, Russia, the UK and the US are campaigning to make India a member of the NSG. The motives are simple – the huge potential for nuclear economics in the Indian market and to help India grow as a counterweight to China. Britain states that India qualifies because of accomplishing a healthy civil nuclear industry and has good non-proliferation credentials. While the first point may be true, the second is doubtful. It's ironic how these advocates of Indian inclusion into the NSG are also advocates of nuclear non-proliferation and have given a commitment under Article VI of the NPT towards nuclear disarmament. Having already failed on the latter, they would also lose their moral authority over the former. Irony also lies in the fact that the same states that felt hard done by Indian transgression in 1974 are pushing for its membership.

The quintessential criterion for the NSG membership is a good non-proliferation record and adherence to international non-proliferation treaties like the NPT, as well as other bilateral or multilateral agreements. It also entails support to international efforts to stop the spread of WMD. India fails on both these accounts. India is not an

France, Russia, the UK and the US are campaigning to make India a member of the NSG. The motives are simple – the huge potential for nuclear economics in the Indian market and to help India grow as a counterweight to China. Britain states that India qualifies because of accomplishing a healthy civil nuclear industry and has good non-proliferation credentials.

NPT member and terms it discriminatory. India championed for nuclear disarmament before the treaty was signed, yet, pursued a nuclear weapons path alongside it. This programme bore fruits four years after the treaty was operational when India tested its nuclear device. In breach of its international agreements with Canada, India diverted plutonium from the CIRUS reactor provided solely for peaceful purposes and used it for military purposes of the 1974 testing. This shows a blatant breach of non-proliferation laws and norms by the Indian state.

Similarly, India and Pakistan signed an agreement on chemical weapons on August 19, 1992. They agreed not to develop, produce or acquire chemical weapons, while reassuring each other of not having any existing stockpiles of such. However, after denying the existence of chemical weapons for years, India in 1997 declared its chemical weapons stockpile. Almost 20 tonnes of sulphur mustard were filled in artillery shells, while some 984 tonnes were stored! The Indian state had, yet again, failed its commitment to stop the growth of WMDs by breaking the agreement.

Diplomatic campaigns aside, if India is allowed membership of the NSG, it would set the worst precedents in the non-proliferation regime's history. Break laws, norms and breach agreements; no punishment will ensue if you provide good economics. This trend will tempt non-nuclear weapons states inside the NPT to withdraw since there is a better trade-off – becoming a nuclear weapon state and a nuclear beneficiary rather than a reliant state. In the Cold War phase, the emphasis was on how to acquire nuclear weapons; now it will be on how to acquire nuclear weapons and develop an effective civil nuclear industry. In the end, all sins are forgiven. This will be an utter nightmare for all. Are economic interests now more important than a safe and secure future world? Is this rational behaviour from world leaders?

Source: The writer is an independent researcher from Islamabad. The Express Tribune, 20 June 2013.

OPINION – Elliott Negin

Wasting More Money on a Missile Defense Delusion

On 2nd week of June 2013, the House decided to throw good money after bad. Tucked inside its \$512 billion defense authorization bill was a provision that allocates funding for a new ground-based missile defense site on the East Coast – despite the fact that missile defense brass don't want the money, at least for that purpose. They say there are other, more cost-effective ways to

strengthen homeland security. In a June 10 letter to SASC Chairman Carl Levin (D-Mich.), the MDA director, Vice Adm. James Syring, and the head of the Army's SMDC, Lt. Gen. Richard Formica, wrote that it would be more economical to invest in missile defense discrimination and sensor capabilities than build a new site. Regardless, the House bill provides \$140 million in seed money for an East Coast missile defense base, which the CBO estimates would cost at least \$3.6 billion to build and operate over the next five years. The bill also includes an amendment requiring the MDA to have the new site up and running by fiscal year 2018. Currently there are two West Coast sites, one at Fort Greely in Alaska and the other at Vandenberg Air Force Base in California, which together host 30 ground-based interceptors.

House lawmakers say an East Coast site is needed to defend against a hypothetical long-range missile attack by Iran. A report published in 2012 by the NAS recommended three locations: Fort Drum and the former Griffiss Air Force Base site in New York and a site in Caribou, Maine, which is near the decommissioned Loring Air Force Base. In early May, New York Sen. Chuck Schumer (D) urged the DoD to put Griffiss and Fort Drum at the top of its list. To his credit, however, Schumer said his request hinged on whether "military experts determine that a new system on the East Coast is necessary, workable and cost-effective...." That's a tall – if not insurmountable – order. The Syring-Formica letter quoted above addressed Schumer's first and third caveats: It's not necessary, and there are other measures they think are more important to fund. But the bigger issue is the fact that after nearly 14 years of tests, the system doesn't work as advertised.

White House Insists the System Is 'Fully Capable':

There are actually four US MDS's. One is the sea-based Aegis system, deployed on Navy ships, which is designed to knock down SRBM and MRBM's. Another system, the Army's THAAD, fires interceptor missiles from a truck-mounted launcher. THAAD targets SRBM and MRBM inside and outside the atmosphere. In April 2013, the Pentagon announced plans to deploy one of its three THAAD batteries to Guam to help defend US forces on the island. A third system, the vehicle-launched PAC-3, intercepts incoming SRBM's in their final phase at lower altitudes than THAAD. The one we're talking about here is the GMD system currently deployed in Alaska and California. Its mission is to shoot down long-range, ICBM in mid-flight. In response to recent North Korean saber-rattling, some US officials have stated unequivocally that the GMD system could stop a North Korean missile. ...

Will Get Fooled Again: How do these official assertions square with reality? According to David Wright, a physicist with the UCS and an expert on missile systems, “[s]uch statements are nonsense since there simply is no test data that shed light on how well the defense would work against a real-world missile attack. Moreover, no one knows what North Korea might equip its missiles with to surprise and fool the defense.” As Wright points out, the ground-based system has never been tested under real-world conditions. All of the tests the MDA has conducted since it began testing in 1999 have been highly scripted. In other words, system operators were told where and when a test “enemy” missile was going to be launched. Even with that information, they failed to knock down dummy enemy targets in eight out of 16 attempts. That’s not very reassuring.

As Wright also notes, the system can be fooled. He co-authored a joint UCS-MIT report, “Countermeasures,” which found that decoys and other countermeasures could defeat the US ground-based missile defense system by fooling its sensors and interceptors.

Any country that has the capability of building a long-range missile, the 2000 report concluded, also would have the capability of outfitting it with effective countermeasures. US intelligence analysts made the same observation in 1999, and it remains true today. In a March 22 blog commemorating the 30th anniversary of President Ronald Reagan’s “Star Wars” speech outlining his vision of a missile defense shield, Wright explained how countermeasures can easily foil the system – and how the Pentagon fudged its tests.

For example, lightweight decoys can be released with the warhead, which is itself disguised to look like a decoy (this is called “anti-simulation”). Not all the decoys need to look exactly the same; in fact the best approach is to have them all look and behave slightly differently so that nothing identifies an object as a decoy versus a warhead. Enough is known publicly about the defense system and its sensors that the attacker can design its countermeasures with the aim of denying those sensors the information the defense would need to identify the warhead.

As discussed in the recent NAS report on missile defense, the Pentagon still doesn’t know how to solve this problem. That’s why the large difference in technical sophistication

between the US and North Korea does not automatically tip the balance in favor of the US in this challenge. None of the intercept tests conducted so far of the US ground-based or ship-based [Aegis] systems have included realistic countermeasures that you should expect in a real-world attack from North Korea. The tests haven’t even included a warhead that is tumbling – intentionally or not – which is a very hard target for interceptors to hit. Some tests have included objects referred to as “decoys” but in each case the warhead and “decoys” looked different and the interceptor was told in advance which object to attack. Such scripted tests may be appropriate at this relatively early stage of development of the system, but they do not show the system will be effective against a real-world attack.

Defense Secretary Hagel’s Unwarranted Confidence:

On March 15, Secretary of Defense Chuck Hagel announced a new series of steps he claimed would strengthen US defenses against potential North Korean and Iranian long-range missiles. Those initiatives include

conducting environmental impact studies for a new GMD site – presumably on the East Coast – and spending \$1 billion for 14 additional ground-based interceptors at Fort Greely, Alaska, which currently has 26 in underground silos. The June 2nd week’s House defense authorization bill would provide a \$107 million down payment for the new interceptors – more funding that the military did not request. “The United States has missile defense systems in place to protect us from

limited ICBM attacks,” Hagel flatly asserted in his opening statement.

During the Q&A session that followed, however, a reporter pressed him. “Mr. Secretary,” he asked, “can you say with confidence that the ground-based interceptors in Alaska would actually shoot down a North Korean missile if it were fired at the US given the very poor test performance of this interceptor?” “We have confidence in our system,” Hagel responded. “And we certainly will not go forward with the additional 14 interceptors until we are sure that we have the complete confidence that we will need. But the American people should be assured that our interceptors are effective.”

Hagel’s answer begged the question. He apparently was talking narrowly about whether the new US interceptor would fly as intended. But until the full system has

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undergone rigorous, real-world testing, how can the Pentagon have the “complete confidence” to spend \$1 billion on 14 more interceptors, increasing its inventory by nearly 50 percent? Likewise, how can House lawmakers have sufficient confidence in the GMD system to force the Pentagon to spend billions more on an East Coast site that it doesn’t want? There’s not enough evidence to warrant such certainty. In these days of budget tightening, money is also an issue. Hagel acknowledged as much in his opening remarks, maintaining that the initiatives he just announced would maximize “increasingly scarce taxpayer resources.” But if the system doesn’t work, Hagel’s new initiatives would waste even more money. The MDA has already spent quite a bit – about \$90 billion since 2002 – and plans to spend about \$8 billion annually through 2017. Meanwhile, it has failed to demonstrate that the GMD or Aegis systems would actually perform in a real-world situation. Until the Pentagon can show that these systems are truly effective, it makes no sense to add more interceptors or build a third missile defense site.

Finally, we need to keep in mind that much more is riding on this issue than US relations with North Korea and Iran. Building another missile defense site or adding more interceptors also could undermine US efforts to reduce Russian and eventually Chinese nuclear arsenals. So if Secretary Hagel really wants to maximize scarce taxpayer resources and make the world a safer place, he should freeze the program until it works, and if it doesn’t work, abandon it. Thirty years of fooling ourselves is enough.

Source: Negin is the director of news and commentary at the Union of Concerned Scientists. Huffington Post, 20 June 2013.

OPINION – Hasan Ehtisham

India’s Pursuit of BMD

India’s willingness to pursue a BMD shield was justified by a number of reasons, which could be its desire for global power status, using China as a bogey for this and to counter an imminent threat from Pakistan or all of these. Notwithstanding the

we need to keep in mind that much more is riding on this issue than US relations with North Korea and Iran. Building another missile defense site or adding more interceptors also could undermine US efforts to reduce Russian and eventually Chinese nuclear arsenals. So if Secretary Hagel really wants to maximize scarce taxpayer resources and make the world a safer place, he should freeze the program until it works, and if it doesn’t work, abandon it.

The USA’s intention to extend BMD to her allies elsewhere and India is laden with serious repercussions for Pakistan and China. According to a recent study by SAAG, South Asia has almost one third of the total ballistic missile capability present in the world. Indian BMD will also start an arm race in the region and would reduce the chances of negotiation on a FMCT.

above, the USA’s intention to extend BMD to her allies elsewhere and India is laden with serious repercussions for Pakistan and China. According to a recent study by SAAG, South Asia has almost one third of the total ballistic missile capability present in the world. Indian BMD is focused against China and Pakistan. India has a dubious NFU nuclear doctrine by retaining a right to use it against any perceived threats. A US-sponsored BMD will surely alter the deterrence capability in India’s favour. Indian BMD will

also start an arm race in the region and would reduce the chances of negotiation on a FMCT. If Pakistan need x number of missiles for its targeting strategy, it shall need x+3 missiles for defeating an anti-ballistic missile system. That would in turn incentivise it to produce more fissile material and negotiating a FMCT would not be in Pakistan’s interest!

India’s pursuit of the BMD and the fact that Pakistan is not safe from the missile threats originating from India compels Pakistan to look for other security options. Is development of BMD a viable option to be considered by Pakistan? If economic challenges are set aside, pursuing a BMD shield appears perfectly legitimate security option. Pakistan has a policy of credible minimum deterrence and may not go in that direction unless it becomes a last option.

A fully operational BMD shield will give India a false sense of security and it may nudge it towards a first strike option. A first strike option would seriously destabilise deterrence in South Asia. It would be pragmatic to start from strengthening the silos – which is called point defence – and missile sites protection to the defence of corridors against possible attacks. Defending missile sites and their silos against a possible first strike would give Islamabad a capability for second strike. Another option against Indian first strike would be corridor defence, which is defending a territory from a particular direction of missile attack. Though Pakistan may take passive defence measures against Indian first strike options due to false sense of confidence, other powers with greater resources will look for more offensive counter-

strategies to penetrate the defensive shield of India. It is better New Delhi does not go down that course.

Source: *Pakistan Observer*, 23 June 2013.

OPINION – Per Peterson

Storage, Disposal Facilities for Nuclear Waste Urgently Needed in Post-Fukushima Japan

The accident at the Fukushima No. 1 nuclear power plant has also influenced US policymaking with regards to high-level radioactive waste from nuclear facilities. The accident once again revealed the need for the swift development of facilities to store and dispose of spent nuclear fuel. We must not leave this problem for the next generation to sort out. For the United States, there was a lot to be learned from the accident that occurred at the Fukushima No. 1 nuclear plant. It focused attention, particularly in Congress, on the problems associated with high-level radioactive waste. At Fukushima, the instrumentation available to monitor the status of the spent fuel stored in pools was completely inadequate. This led to some very important lessons for US. Even before the accident, US policy on spent nuclear waste and other radioactive materials had reached a turning point. In 2010, the Obama administration scrapped a plan to build a permanent disposal site for spent nuclear fuel in Nevada’s Yucca Mountain. The “Blue Ribbon Commission,” an advisory body, was set up to revise DoE policy. ...

The report recommended that the United States search for additional geologic facilities that could be used as permanent disposal sites for spent nuclear fuel. In the meantime, the report also proposed building interim storage facilities for the waste. Our generation has a responsibility to develop these facilities. If a country with the level of atomic energy experience and capabilities of the United States cannot properly manage these materials, the world could become more risky in the longer term. Japan has a policy of reprocessing all its spent fuel to extract plutonium for further use. In the United States, though, nuclear reprocessing was stopped during the presidency of Jimmy Carter in

Japan has a policy of reprocessing all its spent fuel to extract plutonium for further use. In the United States, though, nuclear reprocessing was stopped during the presidency of Jimmy Carter in the late 1970s. In the United States, spent nuclear fuel is now packed away in air-cooled dry-storage tanks located on the sites of decommissioned nuclear power plants. With the passing of time, radiation levels will drop and the spent fuel might become an attractive target for terrorists seeking plutonium, especially if we leave it scattered all over the place.

the late 1970s. In the United States, spent nuclear fuel is now packed away in air-cooled dry-storage tanks located on the sites of decommissioned nuclear power plants. If we develop interim storage facilities, we can consolidate this waste. I would be very concerned if the United States were to set a precedent for other nations of leaving spent fuel scattered at decommissioned facilities. With the passing of time, radiation levels will drop and the spent fuel might become an attractive target for terrorists seeking plutonium, especially if we leave it scattered all over the place.

The Benefits of Interim Storage

Facilities: The commission also emphasized that today we do not know for sure whether spent fuel is a waste or a resource. We said one benefit of interim storage is that it preserves future options; innovations in reprocessing technology could make the spent fuel reusable in the future. The US has not chosen the reprocessing path. It is not economically attractive to use currently available technologies to recycle fuel, like France and Japan have tried to do. The cost is substantially greater than using natural uranium to produce fuel. While the major reactor technology remains light water, I don’t think this situation will change. Plutonium is very hazardous when in powder form. The process used to turn spent fuel into pellets for light-water reactor fuel involves handling plutonium in the form of a highly dispersible powder.

Therefore the safety constraints on handling the fuel are very severe and expensive. I think the future of this traditional type of reprocessing is very limited. This is because by 2030, we will see the introduction of new facilities known as Generation-IV reactors. These are far more suitable for reprocessing than light-water reactors.

No matter how much technology advances, though, there will always be some spent fuel we cannot recycle. As a result, we will still need permanent disposal sites.

There is a widely held concern that interim storage facilities will end up as de facto permanent disposal facilities. As a result, any state or local community that accepts interim facilities should be given

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significant assurances that the storage will not become permanent. The federal government needs to have a clear commitment to developing permanent facilities, while financial penalties should occur if promises are not kept.

Public Understanding and Consent A Must: The debate about these facilities must not be a foregone conclusion. It is important to inform people and gain their agreement at every stage, such as when examining the suitability of a site for geologic disposal. We know this is possible if one uses the correct consent-based processes. In fact, we are already operating a deep geologic repository in New Mexico called the "Waste Isolation Pilot Plant". This is used to dispose of radioactive materials produced during the development of nuclear weapons and so on (transuranic waste). The first site in the United States to produce plutonium for military use was Hanford in the state of Washington. This was the site of a major contamination incident after highly radioactive liquid waste leaked out of corroded tanks. This environmental disaster could perhaps have been avoided if we had had proper geologic facilities to dispose of radioactive materials.

This is an important lesson for Japan, too. If Japan doesn't swiftly develop better storage and disposal strategies for the material recovered from the Fukushima reactor, this could pose significant problems. The primary containment vessels and other parts of the reactor are corroding, just like the tanks at Hanford. As time passes, it will become increasingly difficult to safely remove and dispose of these materials. Any atomic policy requires the trust of the public.

Source: Peterson is a professor at the University of California, Berkeley. The Asahi Shimbun, 23 June 2013.

NUCLEAR STRATEGY

RUSSIA

Russia to Pass Borei and Yasen Nuclear Submarines into Service

According to the C-in-C of the Russian Navy, Russia will receive two nuclear submarines - Alexander Nevsky and Vladimir Monomakh - and one multi-purpose submarine - Severodvinsk - before the end of 2013. If it happens, it will mark the first time since the collapse of the Soviet Union, when Russia passes new nuclear submarines into service. Officials specified, however, that strategic

submarines would be passed into service only after control launches of the Bulava missile that are scheduled to take place during the second half of 2013. The control test launches of Russia's Bulava missile are expected to end successfully. During the latest launches of the missile, there were no system failures observed. Many of the previous test launches of the missile were unsuccessful, which led to the appearance of skepticism among the military administration of the country. Some officials even suggested not to finance the works on the development of the new missile. Yet, engineers overcame all obstacles, and the missile was passed into service.

All of the above-mentioned submarines are going through last stages of tests. Strategic missile submarines

Alexander Nevsky and Vladimir Monomakh, as well as the multipurpose Severodvinsk cruiser, show very good results of their operation. All disadvantages and flaws revealed during the tests will be easily fixed. According to the plans of the Navy command, strategic submarines of Project 955 should become the basis of naval strategic nuclear forces of Russia after 2018. Before that, submarine maker Sevmash Enterprise had not produced one single nuclear submarine for nearly ten years. ... Specialists used state-of-the-art technologies in the electronic

equipment of new submarines. Each nuclear-powered vessel will carry 12 Bulava ICBM.

Submarines of this project are outfitted with a quick rescue chamber designed for the whole crew. The submarines are 170 meters long and 13.5 meters wide. They can submerge at the depth of 450 meters; the crew consists of 107 people (including 55 officers). According to the plans of the MoD, at least eight Borei class submarines are expected to be built. According to some reports, the defense ministry has decided to limit the order to six, although the information has not been officially confirmed.

Fourth-generation multi-purpose submarine of Project 885 Yasen, Severodvinsk, was designed in St. Petersburg. The construction was started at Sevmash in 1993. The construction period took so much time due to economic difficulties and the introduction of fundamentally new design of the body and equipment of the submarine. The Severodvinsk was launched on June 15, 2010. On the Severodvinsk, for the first time in Russian shipbuilding

Russia will receive two nuclear submarines and one multi-purpose submarine before the end of 2013. If it happens, it will mark the first time since the collapse of the Soviet Union, when Russia passes new nuclear submarines into service. Officials specified, however, that strategic submarines would be passed into service only after control launches of the Bulava missile that are scheduled to take place during the second half of 2013.

practice, torpedo tubes were located in the central, rather than in the nose part of the sub. Eight vertical launchers were used for missile weapons. The complex of weapon includes supersonic cruise missiles, universal deep-homing torpedoes and mines. The sub was equipped with advanced communication and navigation systems and a fundamentally new nuclear power plant. The total displacement of the vessel makes up 11,800 tons. A Yasen project submarine can develop the speed of more than 30 knots; the crew counts 85 people.

Source: Pravda, 19 June 2013.

USA

Nuclear Weapons Employment Strategy of US

On 19 June, the President announced new guidance that aligns US nuclear policies to the 21st century security environment. This is the latest in a series of concrete steps the President has made to advance his Prague agenda and the long-term goal of achieving the peace and security of a world without nuclear weapons. Following the release of the 2010 NPR and ratification of the New START Treaty, the President directed the DoD, the DoS, DoE, and the intelligence community, to conduct a detailed analysis of US nuclear deterrence requirements and policy in order to ensure US nuclear posture and plans are aligned to address today's security environment. This review was based on the principle that a robust assessment of today's security environment and resulting Presidential guidance must drive nuclear employment planning, force structure, and posture decisions.

The President's New Guidance:

- Affirms that the US will maintain a credible deterrent, capable of convincing any potential adversary that the adverse consequences of attacking the US or our allies and partners far outweigh any potential benefit they may seek to gain through an attack.
- Directs DoD to align US defense guidance and military plans with the policies of the NPR, including that the US will only consider the use of nuclear weapons in extreme circumstances to defend the vital interests of the US or its allies and partners. The guidance narrows US nuclear strategy to focus on only those objectives and missions that are necessary for deterrence in the 21st century. In so doing, the guidance takes further steps toward reducing the role of nuclear weapons in our security strategy.

- Directs DoD to strengthen non-nuclear capabilities and reduce the role of nuclear weapons in deterring non-nuclear attacks.

- Directs DoD to examine and reduce the role of launch under attack in contingency planning, recognizing that the potential for a surprise, disarming nuclear attack is exceedingly remote. While the US will retain a launch under attack capability, DoD will focus planning on the more likely 21st century contingencies.

- Codifies an alternative approach to hedging against technical or geopolitical risk, which will lead to more effective management of the nuclear weapons stockpile.

- Reaffirms that as long as nuclear weapons exist, the US will maintain a safe, secure and effective arsenal that guarantees the defense of the US and our allies and partners. The President has supported significant investments to modernize the nuclear enterprise and maintain a safe, secure, and effective arsenal. The

administration will continue seeking congressional funding support for the enterprise.

After a comprehensive review of our nuclear forces, the President has determined that we they can ensure the security of the United States and their allies and partners and maintain a strong and credible strategic deterrent while safely pursuing up to a one-third reduction in deployed strategic nuclear weapons from the level established in the New START

Treaty. The US intent is to seek negotiated cuts with Russia so that we can continue to move beyond Cold War nuclear postures. This analysis did not set out to address weapons forward deployed in Europe in support of NATO. The role of nuclear weapons in NATO was examined as part of the 2012 Deterrence and Defense Posture Review, which affirmed Allies' support for further US-Russian nuclear reductions, and underscored that any changes in NATO's nuclear posture must be an Alliance decision.

As we continue to implement the NPR, we are focused on maintaining and improving strategic stability with both Russia and China. In sum, this review was essential to advance the policies laid out in the NPR. The resulting strategy will maintain strategic stability with Russia and China, strengthen regional deterrence, and reassure US allies and partners, while laying the groundwork for negotiations with Russia on how we can mutually and

The resulting strategy will maintain strategic stability with Russia and China, strengthen regional deterrence, and reassure US allies and partners, while laying the groundwork for negotiations with Russia on how we can mutually and verifiably reduce our strategic and nonstrategic nuclear stockpiles and live up to our commitments under the NPT.

verifiably reduce our strategic and nonstrategic nuclear stockpiles and live up to our commitments under the NPT. The President has directed DOD to use the new guidance to begin the process of updating and aligning its directives and contingency plans in order for this policy to be implemented over the course of the 2014.

Source: The White House, Office of the Press Secretary, 19 June 2013.

DoD will Continue to Make Nuclear Investments

The US military will continue to make investments to sustain its nuclear weapons and delivery platforms, even as Washington looks to enter talks with Moscow about reducing deployed strategic warheads by one-third, Defense Secretary Chuck Hagel said on 19 June. The Pentagon will maintain its so-called "triad" of bombers, SSBN's and ICBM's, Hagel said during a speech in Omaha, Neb. Hagel said the US will "maintain a ready and credible nuclear deterrent" while ensuring safety and effectiveness of existing weapons. Even with long-term defense spending cuts on the horizon, the Pentagon will continue to invest in nuclear weapons and delivery systems, Hagel said. DoD would also seek to retain experts in this career field.

Earlier on June 19 during a speech in Berlin, President Barack Obama said he would pursue negotiated reductions with Russia of up to one-third the number of deployed strategic nuclear weapons. Obama's announcement came at the conclusion of a two-year review of the size and mission of US nuclear forces. Also on 19 June, the Pentagon released an updated report on the US nuclear employment strategy, the first update to the document in more than a decade and only the third revision since the end of the Cold War.

In the nine-page report, DoD said the threat of global nuclear war "has become remote," however, "the risk of a nuclear attack has increased." Currently, the greatest "immediate threat and extreme danger" is nuclear terrorism, the report said. Other threats include nuclear proliferation in Iran and North Korea. In the long term, the US "must continue to address the more familiar challenge

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of ensuring strategic stability with Russia and China", the report said. As for the US nuclear stockpile, DoD "should maintain legacy weapons to hedge against the failure of weapons undergoing life-extension only until confidence in each life-extension program is attained," the report said. DoD will also retain the "ability to forward deploy nuclear weapons with heavy bombers and dual-capable fighter aircraft in support of extended deterrence," the report said.

Source: Defense News, 19 June 2013.

BALLISTIC MISSILE DEFENCE

INDIA

India to Extend Range of Missile Interceptor to 5,000 Km

Indian scientists are upgrading the nation's indigenous BMD system to extend the range at which it can kill an incoming missile from 2,000 kilometers to 5,000 kms. The first phase of the BMD system has been completed, a Defence Ministry official said. Avinash Chandra, the head of DRDO, said the agency has given top priority to the BMD effort. A DRDO scientist said the second phase of the program is in advanced stages of development and the first intercept test is likely to be completed by the end of 2013. The improved version will include advanced homemade radar and guidance systems, added the DRDO scientist, but will be an add-on of the first phase. India's homemade BMD system can engage enemy ballistic missiles at the exo-atmospheric layer, just beyond the atmosphere, and at the endo-atmospheric layer within the atmosphere, the DRDO scientist said. To increase hit probability, the system can launch two to three missiles

each for exo- and endo-atmospheric interception simultaneously.

The interceptor's speed is between 4.5 and 5 mach. A typical battery has a long-range radar, missile launchers, mission control centers and other ground systems. The complete network of radars, launch batteries, missiles control centers and launch control centers is

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geographically distributed and connected to a secure communication network. The first phase of the BMD program, which can target missiles at a range of up to 2,000 kilometers, is now in the induction stage, and the system first will be installed around New Delhi, added a source in DRDO.

Source: *Defense News* 18 June 2013.

RUSSIA

Successful Test of a New ICBM "Missile Defense Killer"

On 6 June, Russia performed a successful launch of a new ICBM. The missile was launched from the testing area Kapustin Yar in the Astrakhan region in Russia's south at 9.45 p.m. The missile successfully landed at its destiny point, the Balkhash testing area, at the scheduled time. The aim of this test launch was to check the new missile's flying capacities and reliability. Deputy Prime Minister Dmitry Rogozin, who oversees the defense industry, hailed the test a success and dubbed the new ICBM a "missile defense killer." "Neither current nor future American missile defense systems will be able to prevent that missile from hitting a target dead on"

Source: <http://inserbria.info/news/2013/06/russia-successful-test-of-a-new-icbm/>, 06 June 2013.

USA

Raytheon Extends BMD Capability through Radar Modernization Effort

A US Middle East security partner moved one step closer to gaining an enhanced ballistic missile defense capability when Raytheon completed the redesign of eight circuit card assemblies for a FMS AN/TPY-2 radar. The redesigned cards extend the advanced capabilities found within the original components, while incorporating technologies and processes previously unavailable when Raytheon delivered the first AN/TPY-2 in 2004. The new cards will be inserted into all new AN/TPY-2 radars Raytheon produces. "The redesign ensures uninterrupted production of the AN/TPY-2 radar, a critical element in the defense against the growing ballistic missile threat that endangers the US, our warfighters, allies and partners," said Dave Gulla, vice president of Global Integrated Sensors in Raytheon's IDS business. "With more than 6,300 ballistic missiles outside the control of the US, NATO, Russia and China, Raytheon is seeing significantly increased demand for the capability the AN/TPY-2 radar delivers."

The AN/TPY-2s Raytheon is producing for the FMS customer will serve in terminal mode as the search, detect, track, discrimination and fire-control radar for the THAAD weapon system. US-owned AN/TPY-2s deployed around the globe in forward-based mode cue the BMDS by detecting, discriminating and tracking enemy ballistic missiles in the ascent (boost) phase of flight. An integral capability of the BMDS, AN/TPY-2 is a mobile X-band PAR that helps protect the US, deployed forces, and America's allies and partners by searching, detecting, acquiring and tracking threat ballistic missiles and discriminating between threats and non-threats. AN/TPY-2 is a high resolution, mobile, rapidly deployable X-band radar capable of providing long-range acquisition, precision track, and discrimination of all classes of ballistic missiles, from SRBM to ICBM.

- AN/TPY-2 has performed flawlessly in both terminal and forward-based mode in all major tests.

- On Oct. 25, 2012, two AN/TPY-2 radars - one terminal and one forward-based - participated in FTI-01, the MDA's largest and most complex missile defense flight test. In a complex raid scenario involving multiple targets, both radars met or exceeded all test objectives.

- Forward-based AN/TPY-2s in Japan, Israel and Turkey are currently enabling the protection of the US, deployed forces, and US friends and allies from the growing threat of short-, medium- and long-range missiles.

Source: *Space Daily*, 19 June 2013.

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NUCLEAR ENERGY

FRANCE

France Sees Growing Support for Nuclear Power

Support for nuclear power amongst the French public is on the rise. However, although twice as many people now favour nuclear energy than oppose it, half of the population remains uncommitted. The poll was carried out on behalf of the *Dimanche Ouest France* newspaper by independent polling company Ifop at the end of May, tracking attitudes to nuclear power two years on from the Fukushima Daiichi accident. Of the 2004 respondents, 36% declared themselves to support the use of nuclear energy in France, up from 33% in November 2011 and 32% in July 2011. Meanwhile, the proportion expressing opposition to the use of nuclear energy had fallen to 14%, down 3% from

the November 2011 figures and 6% from July 2011. About a third of the population polled (34%) described themselves as “hesitant”, or undecided, towards nuclear energy. Ifop notes that for the first time since Fukushima, the pro-nuclear percentage of the population outnumbered the undecided. Meanwhile 16% of respondents said they had no opinion at all on the subject.

The respondents to the survey were selected to be representative of the adult population of France in terms of gender, age and occupation. The study found strong correlations between age and opinion on the use of nuclear, with younger people tending either to oppose nuclear or have no opinion with their older peers being more in support: 57% of those aged over 65 expressed themselves as pro-nuclear but only 24% of adults under 24 years old were in favour. Not surprisingly, political affiliations were also reflected in the results: acknowledged supporters of the antinuclear French Green party were resoundingly opposed (50%) or undecided (39%), while the majority of supporters of the pro-nuclear UDI and UDM parties also tended to support the use of nuclear power in France.

The survey also sought opinions on the future role of nuclear in the French energy mix, and compared them with findings from surveys carried out by Ifop both before and after Fukushima. 59% of those polled agreed that France should maintain its current nuclear share in order to ensure its energy independence, up from 54% in a study carried out in March 2013. According to Ifop, the findings are indicative of a post-Fukushima return to favour for nuclear, although still short of the 67% recorded in 2008, the most recent pre-Fukushima survey quoted in the report. Some 41% of the May 2013 respondents agreed that France should reduce its nuclear share “because it is dangerous”. Some 75% of France’s electricity is nuclear-generated thanks to a strategic decision in the early 1970s aimed at ensuring energy security for the country which has few indigenous fossil fuel resources.

Source: Eurasia Review, 25 June 2013.

INDIA

Country’s Growth Depends on Nuclear Energy: NPCIL Officials

NPCIL has given a categorical assurance to people that the proposed Kovvada nuclear project

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the NPCIL has been spending Rs. 25 crore every year in the country for CSR activities. According to the Corporation, India has to depend upon nuclear power for its future needs since thermal, hydel and solar powers cannot meet the growing electricity demands of the country.

The country’s current installed capacity is 2.11 lakh mega watts and it will require 4.25 lakh mega watts of power by end of 2020. Countries like US, China and France are still heavily depending on nuclear power since it will be cheaper and eco-friendly compared to thermal power projects. Giving a power point presentation Kovvada plant Project Director G.V. Ramaesh and MAPS Operations Superintendent M. Venkatachalam said that future nuclear projects will be safest plants with the adoption of advanced technology. They said that new plants such as Kovvada project would spur the economic activity on the lines of Kalpakam which had witnessed rapid development in the last two decades. “Around Rs. 80,000 crore will be invested in Kovvada project which can provide direct employment to 18,000 persons during construction stage. The first phase of the 6000 MW plant will be ready by 2018 if plans are executed as planned,” said Mr. Ramesh.

As part of expansion, the govt. is also constructing 500 MW capacity PFBR project in Kalpakam and it is likely to be completed by 2014 June. BHAVINI, a separate special organisation has been created for the construction of the project where research will also be done to use thorium as a source of energy for the production of nuclear power.

Source: The Hindu, 23 June 2013.

JAPAN

Japan Receives First Nuclear Shipment

A vessel under armed guard and loaded with reprocessed nuclear fuel from France has arrived at a

India has to depend upon nuclear power for its future needs since thermal, hydel and solar powers cannot meet the growing electricity demands of the country. The country’s current installed capacity is 2.11 lakh mega watts and it will require 4.25 lakh mega watts of power by end of 2020.

Japanese port, despite almost all the country's reactors being shut down. The cargo of MOX, a blend of plutonium and uranium, is the first such nuclear fuel to arrive in Japan since the atomic disaster at Fukushima, sparked by the earthquake and tsunami of March 2011.

The fuel left the French port of Cherbourg in mid April bound for Japan, French nuclear group Areva has said. The vessel was specially fitted to be able to transport nuclear material and was escorted by an armed sister ship. Its route was not fully disclosed. ... The fuel was originally due to be shipped back to Japan in the first half of 2011, but the disaster at Fukushima delayed its return and it has been stored in France.

Source: <http://www.news.com.au>, 27 June 2013.

PAKISTAN

Nawaz Sharif Seeks Civil-Nuclear Technology from China

Prime Minister-designate Nawaz Sharif on 22 June sought civil nuclear technology to overcome Pakistan's energy crisis during a meeting with Chinese Premier Li Keqiang. Sharif called on Li at a hotel on 22 June morning and discussed ways to strengthen bilateral relations in different fields. He focussed on civil nuclear technology, trade and foreign investment during his talks with Li. The PML-N chief said China had invested in Pakistani nuclear projects in the past and should provide more cooperation to help the country overcome its energy crisis, the channel reported.... Sharif expressed the hope that the two countries will continue working together for the mutual benefit of their people....

Source: Zee News, 23 June 2013.

URANIUM PRODUCTION

CANADA

Green Light for Cigar Lake Uranium Mine

Canada's NSC has given Cameco's Cigar Lake uranium mine the green light. It's a significant step for the Saskatoon-based mining giant after eight years constructing the \$1.1 billion project. The company says they are pleased to have finally cleared the last hurdle. "This allows

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us to move from a construction phase to a production phase and that's a significant step for Cameco, also the fact that it's a sign of confidence from our regulator is very encouraging," said Rob Geregthy, a spokesperson for Cameco. After construction kicked off in 2005 the

mine was struck by inflow in 2006 and again in 2008. "The geology is probably the most significant challenge we face at Cigar Lake, being mindful of water and inflows, but we believe we have that well under control," said Geregthy....

Jet boring for ore is due to start up this summer with 300,000 pounds of uranium expected to be produced by the end of 2013. That number will be ramped up to 8.2 million pounds by 2017, while creating 250 new jobs. But the company says filling those jobs may also prove to be a challenge. "People have a choice, contractors have choices so we have to work very hard to ensure that we're competitive to offer the best package we possibly can to keep people working at our sites," said Geregthy. ...

Source: Global News, 15 June 2013.

CHINA

China Develops Own Tech to Enrich Uranium

CNNC has announced that it has finally been able to successfully produce enriched uranium for industrial purposes using domestically made technology. The first batch of the independently produced fuel, made in a facility in Lanzhou, Gansu Province, on 21 June, can be used in nuclear power stations nationwide after further processing. The move, widely seen as a great step in the country's nuclear industry, helps industrialize the process of enriching uranium. "After years of research, China has finally achieved this goal. China has become one of the few countries that

own independent uranium enrichment technology and use it for industry. It is a milestone," said Lei Zengguang, chief engineer of CNNC on 24 June.

Uranium enrichment technology is critical to a country's nuclear industry, as raw natural uranium contains only 0.7 % of uranium-235, with the remaining 99.3% being uranium-238. Most of China's nuclear power stations need enriched uranium, containing 2 to 5% of uranium-235, reported CCTV on 22 June. "The Lanzhou plant uses self-

The Lanzhou plant uses self-designed gas centrifuge machines to separate uranium-235 and -238 gas centrifuges consume less power compared with other enrichment means, halving the general costs. "Among all the means of uranium enrichment, gas centrifuges are the most mature. These gas centrifuge machines will be responsible for supplying fuel to all 17 nuclear power stations under operation in China. It can even meet the entire demand by 2020, when the requirement will be five times more than it is now.

designed gas centrifuge machines to separate uranium-235 and -238," Lei said, adding that gas centrifuges consume less power compared with other enrichment means, halving the general costs. "Among all the means of uranium enrichment, gas centrifuges are the most mature. They have already been used in countries such as Russia and the UK," an unnamed nuclear professor with Tsinghua University told the *Global Times* on 24 June. "These gas centrifuge machines will be responsible for supplying fuel to all 17 nuclear power stations under operation in China. It can even meet the entire demand by 2020, when the requirement will be five times more than it is now," Zhu Ji, manager of the Lanzhou uranium enrichment plant, was quoted by CNNC's website as saying.

Source: *Ecns.cn*, 25 June 2013.

NIGER

Areva Restarts Output at Damaged Niger Uranium Mine

France's Areva has partially restarted uranium production at its Somair mine in Niger that was damaged in a suicide bomb attack late May, a company official said on 19 June. Pascal Bernasconi, director-general of Somair, said output at the mine had restarted after teams worked around the clock to repair the site's electrical plant, damaged by a car bomb in the May 23 attack. "We partially restarted production at Somair," he told Reuters, without specifying what share of output had been restarted. "We will find a way of bring the rest of the plant online." Bernasconi said uranium production had restarted using the lixiviation process, during which sulphuric acid is dripped on crushed rocks to create a solution which is turned into a uranium-rich powder known as Yellowcake in the factory.... Somair produced 3000 t of uranium in 2012, roughly two-thirds of Niger's total output. Its suspension cost Areva an estimated 18 billion CFA francs per month.

Source: *Mining Weekly*, 20 June 2013.

NUCLEAR COOPERATION

BRAZIL-JAPAN

Brazil and Japan to Resume Talks on a Nuclear Cooperation Pact

A source from the Japanese government says that the talks on a nuclear development pact between Brazil and Japan will most

Somair produced 3000 t of uranium in 2012, roughly two-thirds of Niger's total output. Its suspension cost Areva an estimated 18 billion CFA francs per month.

likely resume on the 4th week of June after Japanese PM Shinzo Abe will meet with Brazilian President Dilma Rousseff on a summit meeting in Tokyo. The two will be meeting to enhance bilateral ties between the

two countries and the nuclear pact will be foremost on their minds. The signing of an agreement will let Japanese companies export their atomic power generation technology and equipment. Brazil currently has two nuclear power plants online but they are looking to add more to those and shift from hydropower to nuclear energy. They are looking towards Japan to assist them in this transition. The pact will establish a legal framework wherein there will be peaceful use and transfer of knowledge, technologies, equipment and nuclear materials that will ensure non-proliferation. Talks began in January 2011 to sign a cooperation pact between the two countries for the peaceful use of nuclear energy, but the subsequent Great East Japan Earthquake in March 2011 that triggered the nuclear meltdown in Fukushima halted those negotiations.

Abe has been relying on the exports of nuclear power technologies and equipment to help boost the economy and as part of the government's growth strategy. Japan has already signed nuclear cooperation pacts with the UAE and Turkey, while talks are still underway with India. Abe met with leaders of the V4 Group of the EU – Poland, the Czech Republic, Hungary and Slovakia – and agreed to strengthen their cooperation when it comes to nuclear power, among other things.

Source: <http://japandailynews.com>, 20 June 2013.

UK-India

Britain Lobbies for Nuclear Export Group to Admit India

Britain has stepped up efforts to let India join an influential global body controlling nuclear exports, a move that would boost New Delhi's standing as an atomic power but which has faced resistance from China and other countries. The diplomatic tussle centres on whether emerging power India should be allowed into a key forum deciding rules for civilian nuclear trade, even though it has refused to join an international pact under which it would have to give up its nuclear weapons. London, Washington, Paris and others argue nuclear-armed India should join the NSG.... Britain has pressed its case in a paper prepared ahead of the NSG's annual meeting this 2nd week of June, arguing India qualifies because of the size of its

Brazil currently has two nuclear power plants online but they are looking to add more to those and shift from hydropower to nuclear energy. They are looking towards Japan to assist them in this transition.

civilian atomic industry and its commitment to stopping the spread of military material.

Western powers have taken a keen interest in the nuclear emergence of India – particularly its ambition to expand its capacity in the next 20 years by adding nearly 30 reactors, making it an attractive prospect for technology exporters. But other NSG states have voiced doubt about accepting a member like India that built up a nuclear

arsenal outside a global pact set up more than four decades ago to prevent countries from acquiring nuclear arms. If India joined the NSG, it would be the only member of the suppliers group that has not signed up to the 1970 NPT. Beijing's reservations are believed to be influenced by its ties to its ally Pakistan, India's rival, which has also tested atomic bombs and is also outside the NPT, analysts say. India – Asia's third-largest economy – would need the support of all 48 NSG members to join the secretive cartel that regulates nuclear trade and has a key role in countering nuclear threats and proliferation. But the body has remained split. "There is no unanimity on this issue," a senior official from one NSG state said. The US sealed a landmark civilian nuclear supply deal with India in 2008 that China and others found questionable because Delhi is outside the NPT.

Nuclear Rivalries: It ended India's atomic isolation following its 1974 nuclear test and could mean billions of dollars in business for US firms. Britain is also exploring a nuclear cooperation deal with India. The British document, obtained by *Reuters* on 14 June, stated: "The UK strongly supports India's accession to the NSG at the earliest appropriate moment." "The UK believes that the NSG is best served by the inclusion and membership of India, with an important civil nuclear industry which continues to uphold the international non-proliferation architecture," the paper added. It was not immediately clear how the British paper was received. A statement issued after the closed-door meeting in Prague said only the NSG's "relationship with India" was discussed. Officials had said they did not expect any decision already now. At an informal meeting on the issue in Vienna in March, diplomats

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said China stressed the need for equal treatment in South Asia, an apparent reference to Pakistan. ...

Source: Reuters, 15 June 2013.

India, Britain to Take Forward Civil Nuclear Cooperation

Deepening their cooperation, India and Britain have decided to take forward consideration of an agreement on civil nuclear cooperation. This was agreed upon during Indian Foreign Secretary Ranjan Mathai's London visit for the

annual India-Britain Foreign Office consultations. Mathai held talks with his British counterpart, permanent under Secretary Simon Fraser. Both sides recalled the understanding reached during British PM David Cameron's visit to India in February 2013 and it was agreed to take forward consideration of an agreement on civil nuclear cooperation. The British side reiterated their commitment to raising bilateral cooperation on high technologies to a new higher level and expressed support for India's membership of multilateral export control regimes, said a ministry of external affairs statement on 21 June.

Source: Post, 22 June 2013.

INDIA-USA

Westinghouse Nuclear Power Plant: India to Evaluate Work

With the US government finally allowing Westinghouse to share confidential technical information with the Indian nuclear authorities – DAE and AERB – India is getting ready to start a technical evaluation of Westinghouse's reactor that it wants to sell in India. It would mean that after numerous delays, the first US nuclear company could be close to getting an early works agreement with NPCIL. As John Kerry makes his first visit to India as secretary of state, both sides are battling perceptions about the lack of energy in the bilateral relationship. Nothing illustrates this more than the civil nuclear energy cooperation, which was the transformational point of the relationship under George Bush. India and the US finally worked out the Part 810 Assurances after several years of negotiations. These are non-proliferation assurances are required by the US's DoE to

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authorize US companies to participate in civil nuclear activities with India. But Indian officials have complained that the US appeared to be shifting the goalposts at every step....

In addition, the agreement on administrative arrangements between the two sides, is still pending. While India managed to conclude a similar arrangement with the Canadians in a record one month, with the US, its still work in progress. The US continues to voice concerns about the Indian nuclear liability law. Here it is not merely the US, both Russia and France, India's other nuclear partners too have strong reservations about the law. Indians have tried to explain to the US that the law was a reality and that after the regulations, it would be much easier for US companies. ...

Source: The Times of India, 22 June 2013.

JAPAN-POLAND

Japan Interested in Nuclear Cooperation with Poland

Japanese PM Shinzo Abe visited Warsaw on 16th June to participate in the summit of V4 countries and meet with leaders from the region. Polish PM Donald Tusk and Mr Abe talked mostly about cooperation in the energy sector. ... US-Japanese group GE Hitachi, France's Areva and Westinghouse, a US unit of Japan's Toshiba, have all signaled interest in supplying technology for Poland's nuclear power plant project.

But despite the optimistic statements from the prime ministers, Japanese nuclear investment in Poland has several obstacles to overcome. Warsaw plans to build two nuclear plants with a capacity of 3,000 MW each, to begin operations in 2023 and 2029. But deadlines for talks on possible capital involvement and debt financing, as well as for the market model, technical issues and the legal framework of the investment, have already been extended numerous times. Because of tumbling energy prices in recent years, many European countries have halted plans for building new nuclear plans or expanding existing ones.

In Japan, PM Abe's efforts to resume exports of nuclear reactors

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face significant public opposition. According to a survey by *Asahi Shimbun*, a Japanese national newspaper, 59% of respondents said they were opposed to using nuclear reactors proactively to promote economic growth. A mid-level lawmaker of the ruling LDP warned that if Mr Abe pushed exports of nuclear reactors too strongly, it could affect elections to the upper house of Japan's parliament in July. Some caution is reflected in the joint statement by Japan and the V4 group, which says that Tokyo needs to contribute to nuclear safety based

on lessons learned from the accident at the Fukushima power plant in 2011.

Source: Warsaw Business Journal, 17 June 2013.

NUCLEAR PROLIFERATION

GENERAL

How a Massive Nuclear Nonproliferation Effort Led to More Proliferation

.... The Savannah River site nuclear plant - and another just like it in Russia - is meant to transform... plutonium, into commercial reactor fuel that can be burned to provide electricity for homes, schools and factories, essentially turning nuclear "swords into ploughshares." The aim of the so-called Mixed Oxide, or MOX, plant is to ensure the material never winds up in the hands of terrorists. In the right hands, only nine pounds of plutonium - an amount about the size of a baseball - could make a bomb as powerful as the one the US dropped on Hiroshima. The world's military and civilian nuclear programs have produced about 500 mt of pure plutonium, an amount that could fuel tens of thousands of nuclear weapons yet fit into a backyard shed. Countries with nuclear programs continue to add roughly two tons to this inventory every year.

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Washington has been spending hundreds of millions of dollars annually to help secure or remove plutonium and weapons-grade uranium in dozens of countries. But the US-Russia plutonium disposition program, which includes the Savannah River plant, is the US government's single most expensive nonproliferation project now,

according to Michelle Cann, senior budget analyst with a nonprofit group called Partnership for Global Security. Its aim is to eliminate 34 metric tons of US plutonium – or 40% of the US stockpile of military plutonium – in exchange for a similar destruction of 34 tons of plutonium in Russia. But that noble goal has slowly turned into a classic Washington disaster. The plant here – the core of the American half of the bargain – is so grossly over its original budget and so unlikely to achieve its original ambitions that lawmakers and government officials in Washington are on the verge of killing it – even though \$3.7 billion has already been spent. After four contentious, high-level recent government meetings – including several attended by the secretaries of State, Defense and Energy – the Obama administration has proposed to put the plant’s construction on life support, at a cost of \$320 million in 2014, while it examines a cheaper method of eliminating the plutonium.

Blown deadlines, lax oversight, and design and construction snafus have transformed the project into an embarrassing symbol of mismanagement by the DOE’s NNSA, which auditors have repeatedly placed on the government’s “high risk” list of agencies vulnerable to fraud, waste and abuse. And the original deal with the Russians that called for construction of the US plant has been quietly altered and twisted to the point that Russia may actually emerge from the arrangement with more plutonium in its stocks, not less, experts say.

Source: The Atlantic, 24 June 2013.

CHINA–PAKISTAN

China’s Deepening Role in Pakistan’s Nuclear Development

International concerns have been raised by Pakistan’s growing nuclear arsenal, while Beijing has faced much criticism for its cooperation over nuclear energy with Islamabad. Pakistan’s newly elected PM Nawaz Sharif, who turned the country nuclear in 1998, sought Chinese assistance in the field of civil nuclear technology to overcome the country’s energy crisis during a meeting with visiting

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... The US denied Pakistan a civilian nuclear deal, saying that it first had to improve its nuclear proliferation record. So instead, the country has got what it needs from China. Co-operation between China and Pakistan has so far focused largely on the Chashma nuclear power complex in Punjab. Two plants, developed with Chinese support, are already in operation. Another two reactors, each with a capacity of 340 MW, are being built and the two nations agreed in March to construct a 1 GW plant at the complex, to help meet Pakistan’s target of 8GW of nuclear power by 2025. Pakistan’s nuclear arsenal has been a sensitive topic for the US as it tries to improve relations with its frontline ally in the campaign against Islamist extremists. The US has restricted nuclear-related exports to Pakistan since it conducted its nuclear tests in 2008.

Beijing’s nuclear co-operation with Islamabad is likely to stir international concerns over the security of nuclear materials in a country where extremists are challenging the state’s writ. Li’s visit to Pakistan was aimed at deepening strategic bilateral ties, and nuclear cooperation is the essential part of the friendship package. Seven years ago, before the US had signed its civilian nuclear deal with India, Beijing shelved the project to build two more nuclear power plants in Pakistan as it succumbed to pressure from the West and the NSG. Today, the geopolitical landscape is very different.

Source: Excerpted from article by Syed Fazl-e-Haider, a development analyst in Pakistan. South China Morning Post, 25 June 2013.

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IRAN

No Cyber Attack can Hinder Iran's Nuclear Energy Program: Ex-US official

In an interview with the *Times of Israel*, Richard Clarke – the top counterterrorism advisor to Presidents Bill Clinton and George W. Bush – ruled out the efficacy of a cyber means to stop Iran's nuclear activities, especially after the failure of the US- and Israeli-developed Stuxnet computer virus against Iran's nuclear energy facilities. "Well, I think we've kind of tried that. And by trying Stuxnet when we did and being discovered, I think it's going to be very difficult to do something like that again. The Iranians are now much more careful, much more observant," said Clarke. On June 1, 2012, *The New York Times* revealed that Stuxnet was part of a wave of sophisticated digital attacks codenamed "Olympic Games," which US President Barack Obama had ordered against the computer systems that run Iran's main nuclear enrichment facilities.

The paper also confirmed that the Stuxnet virus was created with the help of a secret Israeli intelligence unit. Iranian experts, however, detected the worm in time, averting any damage to the country's industrial sites and resources. Clarke also warned against the "apocalyptic" consequences of a military intervention in Iran, saying that any such measure would involve not only Israel but also the entire region and the US. "I think the Iranian government won't take it lying down," Clarke said, adding, "And that could be very, very messy. It could have worldwide economic effects. And I don't know how it ends." ...

Source: Press TV, 21 June 2013.

Israeli Expert Says Iran Needs 18 Months to Build Bomb

It would take Iran some 18 months to build a nuclear bomb, a senior Israeli security official told *The Times of Israel*. ... Sima Shine, head of the Iranian desk at the Ministry of Strategic Affairs, told the Israeli website. Her comments contradict a statement made by Amos Yadlin, former head of Israel's military intelligence, who has estimated Iran will have crossed the red line set by PM Binyamin Netanyahu by 2013 summer. Addressing the UN in September

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2012, Netanyahu said Iran must not be allowed to produce enough enriched uranium for a single bomb, the website noted. Shine says Iran is wary of crossing Netanyahu's red line but is adding centrifuges for uranium enrichment and working on a parallel plutonium-based nuclear track. "They are slowly but surely establishing a wide and diverse [nuclear] program, without actually crossing the red line," Shine said.

Source: UPI.com, World News, 23

June 2013.

NORTH KOREA

North Korea, China want to Resume Nuclear Talks

North Korean and Chinese officials have called for the resumption of six-party talks on Pyongyang's nuclear program, Chinese authorities said on 19 June. The announcement came as North Korea's chief nuclear negotiator, Kim Kye Gwan, was in Beijing for bilateral talks. Kim and China's Vice Foreign Minister Zhang Yesui issued statements calling for the resumption of the talks to "peacefully solve nuclear issues through dialogue" with all relevant parties. North Korea, South Korea, China, Japan, the US and Russia met last decade to deal with North Korea's nuclear weapons program but those meetings had been discontinued. Tensions surged months ago in world and regional capitals after North Korea launched a long-range rocket, then conducted an underground nuclear test two months later. But since, North Korea has proposed high-level talks with the US to "ease tensions in the Korean Peninsula," its state news agency reported early 16 June. If new talks actually happen, it will be the second senior-level meeting between the US and North Korea since Kim Jong Un took power. The first talks were in February 2012, when Kim Kye Gwan held talks in Beijing with Glyn Davies, the US envoy for North Korea policy.

At the time, North Korea agreed to stop nuclear activity at its main facility in Yongbyon and impose a moratorium on nuclear tests and long-range missile launches in exchange for 240,000 tons of food assistance. However, the agreement fell apart after the UN imposed sanctions in response to North Korea's failed long-range rocket launch in April 2012.

Source: CNN, 19 June 2013.

Iran is wary of crossing Netanyahu's red line but is adding centrifuges for uranium enrichment and working on a parallel plutonium-based nuclear track. They are slowly but surely establishing a wide and diverse [nuclear] program, without actually crossing the red line.

NUCLEAR DISARMAMENT

CHINA

China Backs Barack Obama's Calls on Nuclear Disarmament

China on 20 June backed US President Barack Obama's calls for the US and Russia to slash their atomic arsenals, saying the two former Cold War rivals should bear the brunt of global nuclear disarmament. "The US and Russia

... should substantially reduce their nuclear arsenal in a verifiable and responsible manner," Foreign Ministry spokeswoman Hua Chunying said at a regular briefing in Beijing. She added: "As the two countries have the largest nuclear arsenal, they should bear special and primary responsibility for nuclear disarmament." Her remarks came a day after US President Obama called for the US and Russia's slash of strategic nuclear weapons to be cut down to around 1,000 and for stocks of tactical nuclear arms to be reduced.

Russia and the United States together hold about 90% of the world's nuclear weapons, while China is the 4th biggest nuclear power, behind France, according to the May/June 2013 report by the Bulletin of the Atomic Scientists published in the US. Russia's total inventory of 8,500 warheads slightly surpasses that of 7,700 in the US. France has 300 warheads, while China has 250 and the UK 225, the report said. Russian officials on 19 June reacted coldly to the call by Obama, saying the US should address Moscow's concerns over missile defence first. "How can we take seriously this idea about cuts in strategic nuclear potential while the US is developing its capabilities" to intercept Russia's weapons, deputy PM Dmitry Rogozin asked.

Source: The Economic Times, 20 June 2013.

RUSSIA

Nuclear Cuts can only be Discussed Together with Missile Defense – Lavrov

Talks between Russia and the US on reduction of strategic nuclear weapons must include defense systems, like global BMD, says Russian Foreign Minister Sergey Lavrov. "The strategic missile defense systems affect strategic stability. It has been and will be affected, at least in the foreseeable future by Americans' plans to create non-nuclear strategic weapons that

US President Obama called for the US and Russia's slash of strategic nuclear weapons to be cut down to around 1,000 and for stocks of tactical nuclear arms to be reduced.

He says Russia's stance is that future cuts must be discussed not in the bilateral Russia-US talks but together with other nations that possess nuclear weapons. The Foreign Minister said that even without its European elements the planned US BMD remains a global system laid on the Russian border and that Russian concerns over the process remain.

would possibly be more humane than nuclear bombs, as they would lack the radiation effect, but that would far surpass the existing strategic nuclear weapons by their combat effectiveness", Lavrov said in an interview.

The minister said that Russia suggests holding talks on strategic stability as a whole and to consider all factors that could affect this process. He says Russia's stance is that future cuts must be discussed not in the bilateral Russia-US talks but together with other nations that

possess nuclear weapons. The Foreign Minister said that even without its European elements the planned US BMD remains a global system laid on the Russian border and that Russian concerns over the process remain. "Americans have decided to scrap the fourth stage of their missile defense deployment in Europe and to compensate by placing additional interceptors in Alaska. They also plan to set up one more defense position on the East Coast. We have analyzed this as a whole and this cannot remove our concerns because the system remains global and the deployment of its components is planned and actually takes place on our borders," Lavrov explained.

At the same time he said that Russia was positive about US suggestions of greater transparency of the missile defense plans. The minister reiterated Russia's position that all attempts to shift the strategic balance would not be left unanswered. Lavrov's interview confirmed and detailed Russia's stance on President Barack Obama's suggestion to cut US and Russian nuclear arsenals by one third, voiced during 19th June speech in Berlin. Earlier, President Putin's top aide said that Russia was ready to discuss the nuclear cuts with the United States only if other nuclear states also take part in the process. President Putin himself said in a speech on 19 June that concerns remained both over the anti-missile shields deployed by the US and NATO, adding that the development of high-precision non-nuclear weapons could upset the strategic balance....

Source: RT, 20 June 2013.

NUCLEAR TERRORISM

NORWAY

Government Intends to Ratify Nuclear Terrorism Convention

One of the main purposes of the Convention is to prevent terrorist groups from gaining access to nuclear weapons and other nuclear material. The NTC is particularly

important, given the serious consequences nuclear acts of terrorism can have. The Convention is an important part of international anti-terrorism efforts and non-proliferation work. "The prospect of nuclear weapons falling into the hands of terrorists has always been a nightmare scenario. The NTC provides a better and more comprehensive framework for the fight against international terrorism," said Minister of Foreign Affairs Espen Barth Eide. The Convention obliges states parties to make it a punishable offence to possess or use radioactive material, nuclear material or nuclear devices with the intent to carry out acts of terrorism. The parties are obliged either to prosecute the offences or to extradite the persons concerned to other countries if requested to do so. The Convention is also designed to promote police and judicial cooperation with a view to preventing, investigating and prosecuting criminal offences of this kind.

The Government decided in the Council of State on 14 June to request the Storting's consent to ratify the NTC. Thirteen international conventions dealing with different forms of terrorism have been developed under the auspices of the UN. Norway is already party to 12 of these. The International Convention for the Suppression of Acts of Nuclear Terrorism was adopted by the UN on 13 April 2005 and was opened for signature on 14 Sep 2005. There are currently 86 parties to the Convention.

Source: The Nordic Page, 17 July 2013.

NUCLEAR SAFETY

CHINA

Lockheed Martin Extends Chinese Nuclear Cooperation

Lockheed Martin's nuclear systems and solutions division and SNPAS – a subsidiary of SNPTC – signed an agreement in late 2010 to cooperate on the development of safety systems for use in the CAP1400, a Chinese derivative of Westinghouse's AP1000 design. A dedicated development facility was set up near Scranton, Pennsylvania in early 2011, since when a technical development team from SNPAS has been on-site. The two companies have now signed an agreement, the terms of which have not been

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disclosed, to prototype, manufacture and qualify reactor protection systems. They will develop a nuclear safety instrumentation and control platform based on field programmable gate array technology. This platform will specifically address safety and regulatory concerns related to software common-cause failures in digital nuclear safety systems.

These systems will monitor and detect potential failures in the system. Lockheed Martin said that the platform can be applied in both new plant construction and in upgrades at existing plants.

Construction of the first CAP1400, at Shidaowan in China's Shandong Province, is scheduled to begin in April 2014. SNPTC will take the lead with 55% of the project company. The other stakeholder will be Huaneng Nuclear Power Development Corp, a subsidiary China Huaneng Group, one of China's largest power companies. The partners hope their first CAP1400 will begin operation in 2018. Lockheed Martin has been supplying safety-critical instrumentation and control systems for naval and civilian nuclear projects for more than 50 years. It has been providing digital systems for over 30 years. Its systems are currently operating on all of the USA's nuclear-powered submarines and aircraft carriers.

Source: World Nuclear News, 13 June 2013.

GENERAL

Better Understanding of Silver Fission Products Makes Nuclear Fuel Safer

The long hunt for the location of a rare element within nuclear fuel particles is now finished. Researchers at Idaho National Laboratory have finally spotted where silver amasses inside irradiated particles of a new type of nuclear fuel. The finding will help scientists to further their understanding of how some fission products such as silver can escape from tri-structural isotropic (TRISO) fuel. This specialized fuel could run pebble bed reactors and HTGRs that have numerous enhanced safety features. "This is a major achievement for our research in TRISO particle fuel," says David Petti, INL's director of the Very High Temperature Reactor Technology Development Office. "Understanding the behavior of fission products in our fuel is critical because of the TRISO coating's containment function in the overall safety strategy for HTGRs."

Next-generation HTGR designs incorporate safety systems that rely on the natural laws of physics more than mechanical systems or human intervention. These safety systems extend all the way down to the design of the fuel itself. For nearly 10 years, INL researchers have been studying TRISO fuel, a spherical particle with uranium dioxide or uranium oxy-carbide at its core. The core is coated with layers of carbon and silicon carbide – the TRISO coating – which acts as “the primary containment” for fission products. The coated particles are about the size of a poppy seed. Researchers had known silver fission products were amassing somewhere inside the coated particles. Silver is one of the few fission products that can migrate outside the particles, and scientists want to better understand such movement. But they had not been able to adequately “see” inside the particles until now. The research team reached the new milestone by spotting a tiny sliver of silver using an extremely powerful microscope at the CAES. STEM examination enabled 1-nanometer magnification, where the silver was identified and confirmed in the particle’s silicon carbide layer.

Specifically, the silver resided along the “grain boundaries,” the place in a material where one crystal lattice ends and another begins. The STEM microscope helped confirm both the presence and location of the silver. “The technique and scale of these measurements on TRISO fuel, as well as the identification of silver, are first-of-a-kind and are helping obtain a better understanding of the transport mechanisms associated with these fission products,” says Isabella van Rooyen, INL nuclear materials scientist and principal investigator for the research effort. For the past nearly 40 years, researchers have studied silver in the particles without finding a satisfactory explanation for its movement during and after irradiation. ...

Source: The Daily Fusion, 14 June 2013.

INDIA

The Kudankulam Nuclear Power Plant is in Serious Safety-Trouble

Looks like the power-starved Tamil Nadu has to give up hopes of relief from the yet-to-be-born pride of India’s atomic energy establishment – the KNPP. With false promises of a commissioning sometime early this 2013, similar to the promises in 2012, Tamil Nadu had relied heavily on the plant to ameliorate its power deficit of 4000 MW. The plant, however, is in serious safety-trouble. In a

detailed editorial article in the *New Indian Express*, former AERB Chairman, A Gopalakrishnan has made a new startling revelation – that the Instrumentation and Control system of the KKNP, that is crucial for the safety of any nuclear power reactor, is faulty. This renders the plant highly unsafe.

In April, Gopalakrishnan had charged that the safety of the plant was compromised because of substandard parts and materials from its Russian suppliers, whose procurement director was arrested for cheating. The atomic energy establishment had clarified that there were problems with some valves, which were being rectified. Based on available information, Gopalakrishnan had said that the problem was not with the valves alone, but possibly with the reactor vessel as well because of the possible compromise on quality of Russian parts and materials. The arrest of a senior procurement official of the Russian government company, ZiO-Podolsk, that supplied parts to KKNP, for procuring and supplying inferior quality parts for Russian reactors in different countries had heightened the anxiety of both nuclear-safety and anti-nuclear activists early this 2013.

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In his latest charge based on “piecing information available in the public domain”, Gopalakrishnan says that there “appears to be the inability to eliminate spurious signals of untraced origin appearing in many of the instrumentation cables of paramount importance to safety.”

This phenomenon, which comes under the class of EMI can lead to unpredictable and serious malfunctions and accidents. Simply put, the I&C systems at KKNP, because of their faulty design and installation, are apparently picking up erroneous signals that can mislead the safety systems of the Plant, which can lead to accidents. Sounds really scary! The reason, says the insider-turned-nuclear-whistleblower, is the failure of KKNP to adhere to the highest standards of cable-laying, routing and earthing. Referring to the 2009-10 report of the AERB, he says “the cable problems at Koodankulam have a long history.”

Even 2010-2011 report refers to deviations of cable-laying and their justifications. However, the 2011-2012 report is totally silent on the issue. Subsequently, Gopalakrishnan refers to news reports in 2011 that cited missing power and control cables, which necessitated breaking open the containment domes of the reactor. “One wonders how such a serious error was committed by the NPCIL engineers and their contractors”. The cables apparently were

missing for several kms after the dome was completed! The tireless nuclear-safety campaigner says that this was probably because NPCIL team proceeded with the I&C work without waiting for documentation and instructions to arrive from Russia. They relied on their experience on PHWR – India’s mainstay in nuclear power for many years – without realising that PWR/VVER ... requirements would be significantly different.

The tireless nuclear-safety campaigner says that this was probably because NPCIL team proceeded with the I&C work without waiting for documentation and instructions to arrive from Russia. They relied on their experience on PHWR – India’s mainstay in nuclear power for many years – without realising that PWR/VVER ... requirements would be significantly different.

The delay in Russians transferring the I&C design and installation is corroborated by the report of the WNA. He charges that “while redoing the work, the NPCIL team is unlikely to have come close to meeting the Russian design intent or conformed the installation documents received from them. The origin of the problem lies in the massive installation error of the NPCIL”. ... “It is most likely that the KKNPP cable system, as completed today, has not conformed to the norms and standards of cable selection, EMI shielding, or layout as per Russian, Indian or any other standards.” Gopalakrishnan summarises. “No wonder the EMI problem is persisting, because there is no other short-cut solution other than re-doing a sizable part of the I&C cabling and its layout in accordance with a set of modern standards, agreeable also to the Russians. This may take several more months and extensive re-working, but this must be done in the interest of public safety.

As directed by the SC, the group consisting of NPCIL, AERB, MoEF and TNPCB must certainly find an acceptable resolution of this problem and include it in their report to the apex court.” In May, when the Supreme Court cleared the decks for the commissioning the plant, *Firstpost* had noted that it was in fact more a setback for the nuclear establishment, than the anti-nuclear protestors, because it would now be forced to deliver. The KKNP was touted as India’s big leap in nuclear power – from a 200-plus MW class of reactors to a massive 1000-MW reactor. Not just one, but at least four at the same site. And probably, eight in the future!

Source: *FirstPost*, 19 June 2013.

JAPAN

Japan Finalises New Nuclear Safety Regulations

Japanese nuclear regulators have finally agreed on a new set of safety guidelines, signaling a start to a slow re-opening of the country’s

The refreshed safety standards will mean that operators of nuclear plants will have to check for active earthquake faults and build new tsunami defences. Remote secondary control rooms must also be constructed so that plants can be safely shut down if the main site cannot be reached.

nuclear reactors. Since the disaster in March 2011 when an earthquake caused a series of nuclear meltdowns at the Fukushima nuclear power plant, all but two of Japan’s 50 nuclear reactors have been shut down in response to public fears over safety. The NRA’s new regulations will take effect on July 8, when plants can apply for inspection. This process will take several months, will plants expected to reopen later

this 2013 or early 2014. The refreshed safety standards will mean that operators of nuclear plants will have to check for active earthquake faults and build new tsunami defences. Remote secondary control rooms must also be constructed so that plants can be safely shut down if the main site cannot be reached.

The body that has outlined the new rules is itself a new creation, after the previous regulator was disbanded following public outrage over lax safety standards and cronyism. Before Fukushima safety requirements were also the sole responsibility of plant operators, and were not legally binding. Despite the improvements, the new plans have still attracted criticism, including the claim that loopholes will allow some operators to wait five years before installing mandated equipment. In a poll conducted by the daily newspaper *Asahi Shimbun* 58% of respondents said they opposed restarting the country’s power plants, whilst only 28% approved. Critics of the new scheme also pointed to the fact that four utilities companies running six power plants would be filing for safety checks even though NHK, Japan’s public television network, reported that they had not upgraded their tsunami measures or built secondary control centers. Despite being one of the world’s most earthquake prone countries, Japan has also been one of the most inclined to nuclear power. Prior to 2011

one third of the country’s energy was generated by nuclear means, and although the current government predecessors had committed to phasing out Japan’s use of nuclear power by 2040 there were no mentions of these plans amongst the new regulations.

Source: *The Independent*, 19 June 2013.

NUCLEAR WASTE MANAGEMENT

USA

Nuclear Waste may be Leaking into Soil from Hanford Site

An underground tank holding some of the worst radioactive waste at the nation's most contaminated nuclear site might be leaking into the soil. The US Energy Department said workers at Washington state's Hanford Nuclear Reservation detected higher radioactivity levels under tank AY-102 during a routine inspection on 20 June. Spokeswoman Lori Gamache said the department has notified Washington officials and is investigating the leak further. An engineering analysis team will conduct additional sampling and video inspection to determine the source of the contamination, she said. State and federal officials have long said leaking tanks at Hanford do not pose an immediate threat to the environment or public health. The largest waterway in the Pacific Northwest – the Columbia River – is still at least 5 miles away and the closest communities are several miles downstream.

However, if this dangerous waste escapes the tank into the soil, it raises concerns about it traveling to the groundwater and someday potentially reaching the river. Washington Governor Jay Inslee said in a statement that the situation "must be treated with the utmost seriousness." Inslee said additional testing is expected to take several days. "Our state experts confirm that there is no immediate public health threat. Given the relatively early detection of this potential leak, the river is not at immediate risk of contamination should it be determined that a leak has occurred outside the tank," he said.

Tom Carpenter, executive director of the Seattle-based advocacy group Hanford Challenge, said, "this is really, really bad. They are going to pollute the ground and the groundwater with some of the nastiest stuff, and they don't have a solution for it." AY-102 is one of Hanford's 28 tanks with two walls, which were installed years ago when single-shell tanks began leaking. Some of the worst liquid in those tanks was pumped into the sturdier double-shell tanks. The tanks are now beyond their intended life span. The Energy Department announced in 2012 that AY-102 was leaking between its two walls, but it said then that no waste had escaped. Two radio nuclides comprise much of the radioactivity in Hanford's tanks: cesium-137 and strontium-90. Both take hundreds of years to decay, and exposure to either would increase a person's risk of developing cancer.

Two radio nuclides comprise much of the radioactivity in Hanford's tanks: cesium-137 and strontium-90. Both take hundreds of years to decay, and exposure to either would increase a person's risk of developing cancer.

At the height of World War II, the federal government created Hanford in the remote sagebrush of eastern Washington as part of a hush-hush project to build the atomic bomb. The site ultimately produced plutonium for the world's first atomic blast and for one of two atomic bombs dropped on Japan, and it continued production through the Cold War. Today, it is the nation's most contaminated nuclear site, with cleanup expected to last decades. The effort – with a price tag of about \$2 billion annually – has cost taxpayers \$40 billion to date and is estimated will cost \$115 billion more. The most challenging task so far has been the removal of highly radioactive waste from the 177 aging, underground tanks and construction of a plant to treat that waste. The Energy Department recently notified Washington and Oregon that it may miss two upcoming deadlines to empty some tanks and to complete a key part of the plant to handle some of the worst waste. ...

Source: U.S. News on NBCNEWS, 22 June 2013.

Nuclear Waste Clean-up Delayed and Billions over Budget

The new Secretary of Energy has been on the job only four weeks, but he made a beeline on 19 June to see his biggest headache for himself. Ernest Moniz went to the Hanford Nuclear Reservation in Washington state. Hanford made the plutonium for American nuclear weapons from the Manhattan Project in World War II until 1987. Now, highly radioactive waste is leaking, and a project to clean it up has stalled. The clean-up at the Hanford Nuclear Reservation costs US taxpayers \$2 billion every year. This 2013 winter, engineers discovered six new leaks of radioactive material from underground tanks. "There's something on the order of 1,000 gallons a year that are leaking now from these six tanks," says Washington Gov. Jay Inslee.

The government's clean-up plan involves pumping 56 million gallons of waste out of 177 tanks, mixing it with liquid glass and sealing it in canisters. "That does involve technological challenges that some people have associated with the kind of leap that the moon shot involved," Inslee says. "This has never been done in human history before." The clean-up is supposed to take place at a \$13 billion complex, but the plant has been plagued with technical challenges since the project began in 2000. Most of the problems are at the pre-treatment facility. There's no activity at the building that is the first stop for the nuclear

waste once it's removed from the storage tanks. The DoE suspended construction about a year ago. ...

Source: KTVQ.com, 20 June 2013.

UK

UK's Nuclear Clean-up Programme to Cost Billions More than Expected

The public body charged with overseeing the dismantling of Britain's network of atomic power and research stations will reveal on Monday that its estimates for the lifetime cost of the programme has risen by billions of pounds. Despite this, the Nuclear Decommissioning Authority (NDA) will say in its annual report that it is getting to grips with the clean-up problem because the rate of cost growth is slowing year-on-year. Yet the soaring costs will alarm industry critics at a time when the government is trying to encourage construction of a new generation of atomic power plants while plans to construct a permanent home for high-level radioactive waste are stalled.

In the NDA's 2011 annual report the provisional cost of dealing with the UK's nuclear legacy was put at £53bn, compared with a 2010 figure of £49bn. The new number in the 2012 set of accounts is expected to be around £55bn. But under previous accounting methods, the figure historically used has risen to well over £80bn with some predicting the final bill could exceed £100bn. Soaring costs have already caused serious tensions with the private contractors who manage the NDA's most financially demanding site, Sellafield in Cumbria, and put pressure on a second private clean-up contract for old Magnox power stations scheduled to be awarded next year.

The NDA declined to predict the latest figure for lifetime clean-up costs, saying only "we are publishing these

numbers on June 24 with our annual report", but it confirmed it is looking at the future of the Sellafield clean-up contract with fresh eyes. The contract with Nuclear Management Partners (NMP) – a consortium made up of British company Amec and Areva of France and led by URS of the US– was first signed in 2010 for five years with an option to roll it over for up to 17 years at a total cost of more than £22bn.

The NDA is now in talks with NMP, with the possibility it could re-tender the contract to outside parties before its first break point in March 2014 or even take Sellafield management back into state hands, at least for a temporary period. NMP said it was still "hopeful" of retaining the contract but admitted it had not been without problems so far. "There have been some achievements but this is a complicated site and there are always room for improvements," a consortium spokesman said.

The image of NMP was not improved when Sellafield Ltd, the name the consortium operates under in Cumbria, received a £700,000 fine from a court in Carlisle earlier this month for dumping low-level radioactive waste in a local landfill site. The MP for Copeland, Jamie Reed, has recently written to the NDA and copied in the prime minister, questioning the suitability of NMP continuing to run Sellafield, the biggest nuclear site in Europe. In February, the public accounts committee in parliament heavily criticised NMP for "dithering and delay" and pointed out it had received £54m in performance-related fees last year despite only two out of the 14 major projects at the site being on track. The National Audit Office made similar criticisms in November amid suggestions that the final clean-up cost at Sellafield alone could eventually reach £67.5bn.

Source: <http://www.guardian.co.uk>, 23 June 2013.



Centre for Air Power Studies

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