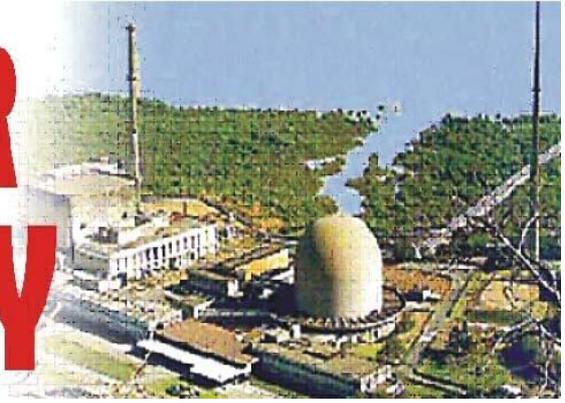


NUCLEAR SECURITY



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

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OPINION – Sreeram Chaulia

Nuclear Entente

The recent revelation that China is negotiating to build three new nuclear plants worth \$13 billion in Muzaffargarh district of Pakistan's Punjab province reinforces the longstanding reality of the former purposefully undermining India's national security.

Even though China's mega nuclear deals with Pakistan are dressed up as responses to acute electricity shortage crippling the latter, the dualistic civil-cum-military nature of nuclear technology and the history of Sino-Pakistani collusion in nuclear weapons and missiles leave little to the imagination about their true strategic intent.

Claims that Chinese-aided nuclear power will address Pakistan's electricity blackouts are exaggerated and only believable in a long-term perspective. It is more timely and cost-effective if Pakistan imports power from India, a prospect under discussion between the two neighbours – it could lead to India supplying 2,500 megawatts to relieve Pakistan's struggling economy. The real reason behind Sino-Pakistani nuclear energy cooperation is containment of India. India has always been in the crosshairs of the "all-weather alliance" between China and Pakistan since the 1950s.

The alliance encompasses conventional and non-conventional military quid pro quos, material and diplomatic assistance to each other during Chinese and Pakistani wars against India, critical infrastructure construction such as the Chinese-built deep-sea port of Gwadar in

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CONTENTS

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

Balochistan province, tacit understandings for Pakistan to moderate Islamic extremism in China's restive Xinjiang region, and general foreign policy coordination at multilateral forums with a view to countering India's positions and opportunities.

To cite Hussain Haqqani, a former Pakistani ambassador to the United States, "for China, Pakistan is a low-cost secondary deterrent to India", while "for Pakistan, China is a high-value guarantor of security against India." Notwithstanding the tectonic shifts in global geopolitics that accompanied the end of the Cold War, the utility of China to Pakistan and vice versa remains entrenched to this day because of their shared animus towards India. China has nuanced its hardline pro-Pakistan stance on the Kashmir dispute, but the fundamentals of

the Beijing-Islamabad axis are rock solid and manifesting in new avatars like nuclear energy cooperation.

Pakistani Prime Minister Nawaz Sharif mentioned the proposed three new Chinese-aided nuclear plants within closed doors to his Cabinet early January 2014. The announcement came on the heels of a prior agreement for China to provide two separate nuclear power reactors worth \$9 billion in the southern metropolis of Karachi.

China's troublesome transfers of sensitive technology and equipment to Pakistan in violation of the nuclear nonproliferation regime are receiving flak from the US. But Islamabad cites Washington's civilian nuclear agreement with New Delhi, which had also acquired nuclear weapons while staying out of the NPT, as a counterargument to claim parity.

If the US carved out an exception for India to buy civilian nuclear technology through the "123 agreement" and an exemption from rules of the NSG, China feels it is entitled to do the same for its South Asian ally so that the balance of power in South Asia does not become more skewed in India's favour. *The Wall Street Journal* explained this tit-for-tat logic by quoting Mushahid Hussain, chairman of Pakistan's senate defence committee: "The India-US nuclear deal was discriminatory. It was meant to prop up India against China."

By deepening its nuclear cooperation with Pakistan, China is in turn propping up Pakistan against India so that New Delhi's capabilities and energies are tied down within South Asia, leaving Asia and the Global South as easy pickings for Chinese domination.

Pakistan enjoys the scary reputation of being the possessor of the "world's fastest growing nuclear arsenal". According to the SIPRI, Pakistan's nuclear stockpile has risen from a low of 90 bombs to a high of 120 bombs between 2011 and 2012. India's inventory of nukes remains at least 10 bombs shorter than what Pakistan has. Meanwhile, China's stockpile has inched up from 240 to 250 nukes in the same period.

It is not publicly known how the rapidity of Pakistan's vertical proliferation (acquisition of more and more

nuclear bombs) is linked to its expanding civilian nuclear cooperation with China. In the mid-1990s, CNNC supplied 5,000 ring magnets to the rogue nuclear scientist A.Q. Khan, to help him double Pakistan's nuclear enrichment capacity at the top secret Kahuta nuclear weapons and missile research facility in Rawalpindi district of Punjab province. Going back further in time, the genesis of the nuclear weapons programme at Kahuta is traced to the presence of on-site Chinese technicians in the early 1980s.

The same CNNC, which had a definitive hand in enhancing Pakistan's nuclear weapons capacities, is now in charge of financing the civilian nuclear power plants in Karachi which are scheduled to come on line by 2019. The total non-transparency with which state-owned Chinese atomic companies like CNNC operate makes it much harder to detect when and in what proportions their civilian technology transfer to Pakistan also morphs into weapons-grade exchange.

If Pakistan is able to ramp up its nuclear weapons arsenal at record speed despite being a subject of macroeconomic bailout from the IMF, Chinese munificence must be given due credit. Rebutting Indian and American objections to the escalating Sino-Pakistani nuclear nexus, China's state-run *Global Times* has argued that "Pakistan serves as a bridgehead for China to further develop friendly ties with West Asian and North African nations as well as regions situated on the Indian Ocean".

The justification that Pakistan offers a pathway for China to access the Muslim world by virtue of the former's geographical proximity to the oil-rich Persian Gulf is one rationale for the Beijing-Islamabad axis to survive so many historic shifts and realignments over decades.

However, China wields alternative keys apart from Pakistan to open doors and oil pipelines to Islamic countries of West Asia and North Africa. Beijing also has its own massive political clout in energy-abundant Central Asia. What is happening in the guise of nuclear energy cooperation between China and Pakistan is old wine in a new bottle, i.e. a routine

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to keep India under relentless strategic pressure. As long as the Chinese play this game, they cannot expect to win trust or goodwill in India.

Source: The writer is a Professor and Dean at the Jindal School of International Affairs. <http://www.deccanchronicle.com>, 28 January 2014.

OPINION – Raja Menon

A Mismatch of Nuclear Doctrines

India intends to deter nuclear use by Pakistan while Pakistan's nuclear weapons are meant to compensate for conventional arms asymmetry. Manufacturing a nuclear weapon does not, as a senior Indian Minister in 1998 claimed, create credible deterrence. Deterrence is entirely a matter of perceptions, a mental effect that is created on the adversary that nuclear use will entail assured retaliatory holocaust. The possibility of nuclear use is thereby pre-empted.

The Indian nuclear doctrine, in that sense, is well articulated – on paper. Since 1998, more than 15 years have passed and in the Indian sub-continent, nuclear arsenals have grown far beyond the small nuclear ambitions that were articulated then. Yet there is an increasing fund of world literature being published, pointing to structural and operational weaknesses in the Indian nuclear arsenal.

The question is not whether India has built enough nuclear bombs. Hardly anyone questions this basic fact, but the ideational systems that will ensure the 'massive' retaliation promised in the doctrine are being increasingly questioned by scholars and analysts worldwide. Pakistani observers cannot help but be swayed and dangerously influenced by such literature, thereby inducing them to think the unthinkable.

What does not help in encouraging sober thinking is the fact that since the end of the Second World War, South Asia has seen the largest number of shooting wars in the world. So the questions of nuclear use will not arise in the quiet peace of neighbourly relations, but in the

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India is the only nuclear weapon country without a CDS to act as the interface between the PM, the NCA and the military who 'own' the weapons – at least most of it. In the guise of safety, India's nuclear weapons are not only 'de-mated' and the core and ignition device separated from the warhead, but the separate components are under different departmental control.

stress of combat over the LoC or the international border.

The 1998 Test: Critics of the credibility of India's nuclear arsenal begin with their doubts on the success of the thermo-nuclear test of 1998, which they claim was a 'fizzle.' There has been much toing-and-froing in technical journals, of the veracity, accuracy and interpretation of seismic readings.

There has also been an occasional closed door briefing by select bomb makers – but surprisingly there has not been, to date, a clear unambiguous public statement from the right source about the country's thermo-nuclear capacity being fielded in India's nuclear arsenal. This is a matter of some negligence, considering that the only members of the scientific community who have spoken on this issue are deeply sceptical of the success of the thermo-nuclear test.

The command and control of nuclear forces are another area of criticism, and not surprisingly so, since India is the only nuclear weapon country without a CDS to act as the interface between the PM, the NCA and the military who 'own' the weapons – at least most of it. In the guise of safety, India's nuclear weapons are not only 'de-mated' and the core and ignition device separated from the warhead, but the separate components are under different departmental control. The actual reason for this bizarre arrangement is quite obvious. There is a petty turf war, and neither the DAE nor the DRDO is willing to let go of the controlling part of the bomb, even if it means a cumbersome and unnecessary loss of control. Needless to say, between the military, the DAE and the DRDO, none of them has any hierarchical control over the other two.

Other critics have written to say that having opted for road or rail mobile launching arrangements, India does not have the robust transport, road and rail infrastructure to move the missiles, warheads and cores from safe storage to launch hideouts and dispersal points with confidence and alacrity. These weaknesses have led to critics stating that India's nuclear

capability is disaggregated and with weak institutional features.

In the case of China, it is conceded that India feels more threatened by Chinese nuclear delivery than vice-versa. Yet, in the absence of the Agni long-range missiles, it is vaguely surmised that the Indian retaliatory capacity is based on air delivery weapons, which could mean anything – Mirages, Jaguars, Su 30s. The absence of the CDS results in even knowledgeable Indians conjecturing that the SFC will completely bypass the military chain of command and operate directly under the PMO. This, of course, raises other more serious problems.

In the case of deterrence with Pakistan, it is accepted that the doctrines of the two countries are mismatched. India intends to deter nuclear use by Pakistan while Pakistan's nuclear weapons are meant to compensate for conventional arms asymmetry. At the same time, Pakistan relies on 20,000 LeT cadres as an extension of its armed forces to create terror strikes, to which the Indian answer is to punish the Pakistani state with conventional war. Thus arises the vague and elastic concept of a nuclear threshold. Yet, the Indian NCA is ill designed to manage the inevitable South Asian transition from conventional war to a possible nuclear exchange – or the frantic strategic signalling that is bound to occur as the threshold approaches.

If, for instance, the threshold was to materialise as a result of an armoured incursion, the Indian NCA by its location, composition and infrastructure would be entirely unaware of the impending catastrophe. Hanging untethered to any commanding authority, civilian or military, would be the IDS, a well-staffed organisation designed for the civilian-military interface, but currently without a head, nor with any links to the SFC.

After much persuasion, there now exists a skeleton nuclear staff under the NSA, normally

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Against China where our capabilities are undeveloped, a certain amount of ambiguity is sensible, but against a country which is openly wedded to first use, and is introducing battlefield weapons, an untended 10-year-old piece of paper is inadequate.

Something needs to be done to reassure both the domestic and international audience that with high pressure terrorism lurking across the border, it is not just India's strategic restraint that will keep the peace.... Nuclear signalling from the Indian government is hugely overdue, so much so that it will take some effort to restore stability to South Asian deterrence.

headed by the retired SFC. But while its Pakistani counterpart, the SPD, is highly active both on the domestic and international conference circuit, its Indian counterpart seems to be totally tongue tied, non-participatory and holed up at its desk. Foreign critics have noted the introduction of battlefield nuclear weapons in Pakistan's arsenal and raised doubts of the likelihood of 'massive' retaliation in response to a small 'warning' shot by Islamabad. This is what the Indian doctrine

promises. Life for the leaders of the strategic community would be easy if a doctrine, once written on paper, could be left unchanged for decades without reinforcement, to prove its validity. That unfortunately is not the case in a dynamic field where the stakes are the survival of nations. Even K. Subramanyam had warned that 'massive'

retaliation was an outmoded concept and difficult to enforce without periodic reinforcement. So this article is inspired not because India is not continuing to arm itself with bombs and missiles.

This piece is inspired by the increasing clamour in international literature that

India's penchant for secrecy is ill-suited to conveying the stabilising threat of nuclear deterrence. Against China where our capabilities are undeveloped, a certain amount of ambiguity is sensible, but against a country which is openly wedded to first use, and is introducing battlefield weapons, an untended 10-year-old piece of paper is inadequate.

Signalling, Overdue: Something needs to be done to reassure both the domestic and international audience that with high pressure terrorism lurking across the border, it is not just India's strategic restraint that will keep the peace.... Nuclear signalling from the Indian government is hugely overdue, so much so that it will take some effort to restore stability to South Asian deterrence. The first

target should be the Indian strategic community and there are enough discussions and conferences where officers from the SFC and nuclear staff could provide discrete assurances that things are not anarchic with India's nuclear command and control.

The strategic community in turn will carry the message abroad or to foreign observers that in the face of Indian official silence, they need not imagine the worst. The establishment needs to do more than arrogantly refer to the doctrine as being the sole answer to all questions. In deterrence, only perceptions matter and there is a disturbing build-up of literature indicating that the disbelief of others in our nuclear command and control is in urgent need of correction.

Source: *The Hindu*, 22 January 2014.

OPINION – Lawrence S. Wittner

The Endless Arms Race: Despite Great Power Promises, New Nuclear Weapons are on the Way

It's heartening to see that an agreement has been reached to ensure that Iran honors its commitment, made when it signed the 1970 nuclear NPT, to forgo developing nuclear weapons. But what about the other key part of the NPT, Article VI, which commits nuclear-armed nations to "cessation of the nuclear arms race at an early date and to nuclear disarmament," as well as to "a treaty on general and complete disarmament"? Here we find that, 44 years after the NPT went into force, the US and other nuclear powers continue to pursue their nuclear weapons buildups, with no end in sight. On January 8, 2014, U.S. Defense Secretary Chuck Hagel announced what Reuters termed "ambitious plans to upgrade [U.S.] nuclear weapons systems by modernizing weapons and building new submarines, missiles and bombers to deliver them."

The Pentagon intends to build a dozen new ballistic missile submarines, a new fleet of long-range nuclear bombers, and new intercontinental ballistic missiles. The Congressional Budget Office estimated in late December 2013 that implementing the plans would cost \$355 billion over the next decade, while an analysis by the independent Center for Nonproliferation Studies reported that this upgrade of US nuclear forces would cost \$1 trillion over the next 30 years. If the higher estimate proves correct, the submarines alone would cost over \$29 billion each.

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Of course, the US already has a massive nuclear weapons capability — approximately 7,700 nuclear weapons, with more than enough explosive power to destroy the world. Together with Russia, it possesses about 95% of the more than 17,000 nuclear weapons that comprise the global nuclear arsenal. Nor is the US the only nation with grand nuclear ambitions.

Although China currently has 'only' about 250 nuclear weapons, including 75 ICBMs, it recently flight-tested a hypersonic nuclear missile delivery vehicle capable of penetrating any existing defense system. The weapon, dubbed the Wu-14 by U.S. officials, was detected flying at ten times the speed of sound during a test flight over China during early January 2014. According to Chinese scientists, their government had put an "enormous investment" into the project, with more than a hundred teams from leading research institutes and universities working on it. Professor Wang Yuhui, a researcher on hypersonic flight control at Nanjing University, stated that "many more tests will be carried out" to solve the remaining technical problems. "It's just the beginning." Ni Lexiong, a

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Shanghai-based naval expert, commented approvingly that “missiles will play a dominant role in warfare, and China has a very clear idea of what is important.”

Other nations are engaged in this arms race, as well. Russia, the other dominant nuclear power, seems determined to keep pace with the US through modernization of its nuclear forces. The development of new, updated Russian ICBMs is proceeding rapidly, while new nuclear submarines are already being produced. Also, the Russian government has started work on a new strategic bomber, known as the PAK DA, which reportedly will become operational in 2025. Both Russia and India are known to be working on their own versions of a hypersonic nuclear missile carrier.

But, thus far, these two nuclear nations lag behind the US and China in its development. Israel is also proceeding with modernization of its nuclear weapons, and apparently played the key role in scuttling the proposed UN conference on a nuclear weapons-free zone in the Middle East in 2012. This nuclear weapons buildup certainly contradicts the official rhetoric. On April 5, 2009, in his first major foreign policy address, President Barack Obama proclaimed “America’s commitment to seek the peace and security of a world without nuclear weapons.” That fall, the UN Security Council — including Russia, China, Britain, France, and the US, all of them nuclear powers — unanimously passed Resolution 1887, which reiterated the point that the NPT required the “disarmament of countries currently possessing nuclear weapons.” But rhetoric, it seems, is one thing and action quite another.

Thus, although the Iranian government’s willingness to forgo the development of nuclear weapons is cause for encouragement, the failure of the nuclear nations to fulfill their own NPT obligations is

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appalling. Given these nations’ enhanced preparations for nuclear war — a war that would be nothing short of catastrophic — their evasion of responsibility should be condemned by everyone seeking a safer, saner world.

Source: Huntington News, 20

January 2014.

OPINION – Sergei Brezkun

Nuclear Weapons are the Only Guarantor of Security

Russia’s military doctrine highlights the significance of nuclear weapons for the defence of the country, but many argue that their role is steadily declining. Strategic nuclear forces, however, have been and remain Russia’s only guarantee of security. Should conventional weapons be deployed and enhanced? What is a greater priority, the Mistral amphibious assault ship or returning to medium-range missiles such as the Pioneer?

Judging from the statements of Russian officials and publications of military experts, the nuclear factor is being fundamentally underestimated. For some

Nuclear deterrence is not a hypothetical countermeasure to some threat, but a real method of avoiding war. No one in their right mind would want to provoke or discriminate against a country capable of responding in a way guaranteed to obliterate the aggressor. It is no coincidence the U.S. is minimizing Russia’s nuclear potential step-by-step (and at the same time its semblance of a fair partnership), making a first disarming strike easier.

reason, many people forget that nuclear deterrence is not a hypothetical countermeasure to some threat, but a real method of avoiding war. No one in their right mind would want to provoke or discriminate against a country capable of responding in a way guaranteed to obliterate the aggressor. It is no coincidence the U.S. is minimizing Russia’s nuclear potential step-by-step (and at the same time its semblance of a fair partnership), making a first disarming strike easier. Russia has been emulating the military organization of the US lately by

attempting to develop cyber command, unmanned aircraft, acquiring imported ships, and so on. However, attempting to play by American rules on their field is doomed to fail.

First, Russia has different economic, scientific, and technological resources, and secondly, the systemic role of the U.S. army is completely different. The

American army is constantly engaged in actual military operations around the world, which requires modern conventional weapons, including attack aircraft, strike drones, and cyber systems. The Russian armed forces have no vital need for these types of weapons. Of course, it would be nice if Russian soldiers had nanomaterial suits, but 500 nuclear Pioneer missiles would prevent them from being sent to war in the first place.

In the meantime, we see plans adopted under President Medvedev for re-equipping by 2020. For example, 4.5 trillion rubles is earmarked for modernizing the navy. For that amount the Pioneer missile could be brought back into production with a range of five to six thousand kms and could be produced in such quantities that it would provide effective regional deterrence against a whole range of possible external threats to continental

Russia - from NATO to Japan. Purchasing Mistral would let Japan know that its claim to the Kuril Islands cannot go beyond the level of diplomatic rhetoric. Ultramodern amphibious assault ships can scare a potential aggressor, of course, but not as much as medium-range missiles.

It would be enough to announce that the hostilities will immediately provoke a strike from deep inside the national territory on a minimally populated area of the aggressor that has been specified in advance. Would the aggressor be willing to test the efficiency of its missile defense by not evacuating residents of the target area? This tough stance would first cause universal outrage and anti-Russian hysteria, but the Far East it would be more securely protected by missiles than all of the Pacific Fleet. It would give similar security guarantees in all directions - south, west, and north. However, Russian authorities have no plans to fully restore the strategic nuclear forces. Not only because of international treaties, but also because, apparently, there is no foreign currency income to be counted on from exporting nuclear arms.

Fifth-generation fighters are intended to win air supremacy, but it's not clear on whose territory. In fact, not a single Soviet jet fighter ever fought to defend Soviet airspace. The same applies to tanks, ships, and guns, if you don't count localized conflicts

abroad. The war experience of entire generations of military equipment has been only on paper. The Soviet Union's strategic nuclear forces provided it real stability and peace. Russia should not throw away the experience of Soviet predecessors and limit the potential of its greatest means of defense. Although nuclear forces in the post-Soviet period have suffered considerable damage, they are still comparable with the previous level, remaining second in the world and far ahead of third place.

If Russia's defense were optimized by strengthening the role of nuclear weapons in ensuring global and regional deterrence of potential aggression against Russia, 20 trillion rubles would hardly be needed for tanks and fighter planes. And if this money is in the treasury, or will be, when Russia's military is reorganized giving priority to nuclear weapons, it can be partially redirected towards social needs.

All this is possible if Russia clearly and definitely makes a choice based on its natural historical advantages. Conventional armed forces, of course, are also needed, but they are secondary. Russian's nuclear factor has always maintained global peace, so if its power is restored, a stable future would be assured.

Source: Sergei Brezkun is a professor of the Academy of Military Sciences. Russia & India Report, 16 January 2014.

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OPINION – David W. Kearns

The Folly of New Iran Sanctions

While the momentum seems to have stalled, the movement in the US Senate second week 2014 to pass a bill raising new sanctions on Iran threatened to undermine the negotiations for a long-term, comprehensive solution to the nuclear issue, just as the interim agreement negotiated in Geneva is planned to go into effect. What was particularly unusual was the bipartisan nature of the support for a bill. Led by SFRC Chairman Robert Menendez, as many as sixteen Democratic Senators had cosponsored the bill, moving it close to a 60-vote "filibuster proof" margin, which (after likely passage in the House) would force a veto by President Obama.

The timing of the legislation is curious because of the delicate nature of the negotiations and the ongoing diplomacy between the US and its partners and Iran. Hardliners on all sides are skeptical of any deals, but unlike past negotiations, the stakes this time seem much higher. Well-meaning intentions aside, any legislation that precipitates an Iranian walkout and a collapse of the negotiations will likely be viewed by friends and adversaries alike as a major failure by the US. However, unlike past instances, the probability of war has significantly increased.

This is no longer a debate about the relative merits of allowing Iran to acquire a functional nuclear weapon capability or the capacity to rapidly construct and deploy several bombs (often called a "breakout" capacity). Various experts have considered the probability of Tehran achieving a nuclear weapon and assessed the implications for regional and global security. More optimistic observers conclude that Iran could be contained by the US and its allies, and deterred from ever using its weapons. As evidence, they cite the acquisition of nuclear weapons by Stalin's Soviet Union, Mao's China, India and Pakistan, two nations locked in an intense historical rivalry, and North Korea. Despite the limited proliferation of nuclear weapons

– nowhere near that predicted in the 1960s – nuclear weapons have not been used. If indeed Iran has designs for a nuclear weapon, these experts argue it most likely to deter outside actors like the US or Israel from removing the regime.

More pessimistic observers disagree and take much less comfort in the history of proliferation. The historical record, including the evidence of risky crisis-initiation behavior between the two Superpowers paints a less sanguine picture. More importantly, looking at the modern Middle East, an Iranian bomb would potentially transform regional security dynamics. Given the region's geography and its particular vulnerability to nuclear attack, Israel (an undeclared nuclear power) would be on high-

alert for any Iranian move. Other actors like Saudi Arabia may seek to acquire their own nuclear deterrent, leading to further proliferation within a region which is already flush with radical terrorist organizations operating across various troubled states. It seems implausible that Tehran's leaders could ever believe that the delivery of a nuclear weapon on Israeli soil by Hezbollah, rather than missile would somehow go unattributed or unpunished, but the introduction of an Iranian nuclear weapons program into a region that is already so tumultuous conjures particularly grim scenarios.

Nonetheless, this debate has effectively been made moot by official U.S. and Israeli policies. The clear commitment of the Obama administration to thwart Tehran from acquiring a nuclear weapon has been in place for some time. Containment is not an option, and military force will ostensibly be used to prevent

an Iranian nuclear weapon from becoming operational. Despite this commitment, the Israeli government has consistently expressed its willingness to act alone to stop an Iranian bomb even without US support. While hardliners in Tel Aviv and Washington may not agree, these are both credible threats that the regime in Tehran must take seriously. Thus, the situation confronting Iran and the world is either the peaceful negotiated solution to the nuclear question, or the high likelihood of another destructive, costly war in a region

already torn apart by conflict.

The current sanctions bill in the Senate is not about providing President Obama and Secretary Kerry with greater leverage in the negotiations. The Iranian delegation has made clear that it views any such sanctions as an indication of bad faith that will wreck the process and undo any progress made to this point. With the interim agreement set to go into effect end of January 2014 this is clearly not the time for the Senate to usurp the authority of the commander-in-chief and his chief diplomat. Taking their respective rationales at face value, the Democratic members of the Senate supporting the sanctions legislation may have good intentions to provide a stronger "bad cop" to Secretary Kerry's "good cop" in Geneva. This is

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short-sighted. New sanctions will not only play into the narrative of hard-liners in Iran who don't want agreement, it will also isolate the US from its negotiating partners and likely cripple the cohesive united front that has seemingly emerged throughout the talks. In doing so, it is most likely to fulfill the wishes of hardliners in Israel and the US that simply don't want an agreement and refuse to take any "yes" for an answer. However, with a failure of negotiations, military conflict is much more likely.

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Despite the fact that the Israel's nuclear programme has been an open secret since a disgruntled technician, Mordechai Vanunu, blew the whistle on it in 1986, the official Israeli position is still never to confirm or deny its existence. When the former speaker of the Knesset, Avraham Burg, broke the taboo in December 2013, declaring Israeli possession of both nuclear and chemical weapons and describing the official non-disclosure policy as "outdated and childish" a rightwing group formally called for a police

Source: *Huffington Post*, 19 January 2014.

OPINION – Julian Borger

The Truth About Israel's Secret Nuclear Arsenal

Israel has been stealing nuclear secrets and covertly making bombs since the 1950s. And western governments, including Britain and the US, turn a blind eye. But how can we expect Iran to curb its nuclear ambitions if the Israelis won't come clean? Deep beneath desert sands, an embattled Middle Eastern state has built a covert nuclear bomb, using technology and materials provided by friendly powers or stolen by a clandestine network of agents. It is the stuff of pulp thrillers and the sort of narrative often used to characterise the worst fears about the Iranian nuclear programme. In reality, though, neither US nor British intelligence believe Tehran has decided to build a bomb, and Iran's atomic projects are under constant international monitoring.

The exotic tale of the bomb hidden in the desert is a true story, though. It's just one that applies to another country. In an extraordinary feat of subterfuge, Israel managed to assemble an entire underground nuclear arsenal – now estimated at 80 warheads, on a par with India and Pakistan – and even tested a bomb nearly half a century ago, with a minimum of international outcry or even much public awareness of what it was doing.

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investigation for treason.

Meanwhile, western governments have played along with the policy of "opacity" by avoiding all mention of the issue. In 2009, when a veteran Washington reporter, Helen Thomas, asked Barack Obama in the first month of his presidency if he knew of any country in the Middle East with nuclear weapons, he dodged the trapdoor by saying only that he did not wish to "speculate". UK governments have generally followed suit. Asked in the House of Lords in November 2013 about Israeli nuclear weapons, Baroness Warsi answered tangentially. "Israel has not declared a nuclear weapons programme. We have regular discussions with the government of Israel on a range of nuclear-related issues," the minister said. "The government of Israel is in no doubt as to our views. We encourage Israel to become a state party to the NPT." But through the cracks in this stone wall, more and more details continue to emerge of how Israel built its nuclear weapons from smuggled parts and pilfered technology.

The tale serves as a historical counterpoint to today's drawn-out struggle over Iran's nuclear ambitions. The parallels are not exact – Israel, unlike Iran, never signed up to the 1968 NPT so could not violate it. But it almost certainly broke a treaty banning nuclear tests, as well as countless national and international laws restricting the traffic in nuclear materials and technology. The list of nations

that secretly sold Israel the material and expertise to make nuclear warheads, or who turned a blind eye to its theft, include today's staunchest campaigners against proliferation: the US, France, Germany, Britain and even Norway.

Meanwhile, Israeli agents charged with buying fissile material and state-of-the-art technology found their way into some of the most sensitive industrial establishments in the world. This daring and remarkably successful spy ring, known as Lakam, the Hebrew acronym for the innocuous-sounding Science Liaison Bureau, included such colourful figures as Arnon Milchan, a billionaire Hollywood producer behind such hits as *Pretty Woman*, *LA Confidential* and *12 Years a Slave*, who finally admitted his role in December 2013. "Do you know what it's like to be a twenty something-year-old kid [and] his country lets him be James Bond? Wow! The action! That was exciting," he said in an Israeli documentary.

Milchan's life story is colourful, and unlikely enough to be the subject of one of the blockbusters he bankrolls. In the documentary, Robert de Niro recalls discussing Milchan's role in the illicit purchase of nuclear-warhead triggers. "At some point I was asking something about that, being friends, but not in an accusatory way. I just wanted to know," De Niro says. "And he said: yeah I did that. Israel's my country." Milchan was not shy about using Hollywood connections to help his shadowy second career. At one point, he admits in the documentary, he used the lure of a visit to actor Richard Dreyfuss's home to get a top US nuclear scientist, Arthur Biehl, to join the board of one of his companies. According to Milchan's biography, by Israeli journalists Meir Doron and Joseph Gelman, he was recruited in 1965 by Israel's current president, Shimon Peres, who he met in a Tel Aviv nightclub... Milchan, who then ran the family fertiliser company, never looked back, playing a central role in Israel's clandestine acquisition programme.

He was responsible for securing vital uranium-enrichment technology, photographing centrifuge blueprints that a German executive had been bribed into temporarily "mislaying" in his kitchen. The same blueprints, belonging to the European uranium

enrichment consortium, Urenco, were stolen a second time by a Pakistani employee, AQ Khan, who used them to found his country's enrichment programme and to set up a global nuclear smuggling business, selling the design to Libya, North Korea and Iran. For that reason, Israel's centrifuges are near-identical to Iran's, a convergence that allowed Israeli to try out a computer worm, codenamed Stuxnet, on its own centrifuges before unleashing it on Iran in 2010.

Arguably, Lakam's exploits were even more daring than Khan's. In 1968, it organised the disappearance of an entire freighter full of uranium ore in the middle of the Mediterranean. In what became known as the Plumbat affair, the Israelis used a web of front companies to buy a consignment of uranium oxide, known as yellowcake, in Antwerp. The yellowcake was concealed in drums labelled "plumbat", a lead derivative, and loaded onto a freighter leased by a phony Liberian company. The sale was camouflaged as a transaction between German and Italian companies with help from German officials, reportedly in return for an Israeli offer to help the Germans with centrifuge technology.

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When the ship, the *Scheersberg A*, docked in Rotterdam, the entire crew was dismissed on the pretext that the vessel had been sold and an Israeli crew took their place. The ship sailed into the Mediterranean where, under

Israeli naval guard, the cargo was transferred to another vessel. US and British documents declassified in 2013 also revealed a previously unknown Israeli purchase of about 100 tons of yellowcake from Argentina in 1963 or 1964, without the safeguards typically used in nuclear transactions to prevent the material being used in weapons. Israel had few qualms about proliferating nuclear weapons knowhow and materials, giving South Africa's apartheid regime help in developing its own bomb in the 1970s in return for 600 tons of yellowcake.

Israel's nuclear reactor also required deuterium oxide, also known as heavy water, to moderate the fissile reaction. For that, Israel turned to Norway and Britain. In 1959, Israel managed to buy 20 tons of heavy water that Norway had sold to the UK but was surplus to requirements for the British nuclear

programme. Both governments were suspicious that the material would be used to make weapons, but decided to look the other way. In documents seen by the BBC in 2005 British officials argued it would be "over-zealous" to impose safeguards. For its part, Norway carried out only one inspection visit, in 1961.

Israel's nuclear-weapons project could never have got off the ground, though, without an enormous contribution from France. The country that took the toughest line on counter-proliferation when it came to Iran helped lay the foundations of Israel's nuclear weapons programme, driven by by a sense of guilt over letting Israel down in the 1956 Suez conflict, sympathy from French-Jewish scientists, intelligence-sharing over Algeria and a drive to sell French expertise and abroad. ... France's first reactor went critical as early as 1948 but the decision to build nuclear weapons seems to have been taken in 1954, after Pierre Mendès France made his first trip to Washington as president of the council of ministers of the chaotic Fourth Republic. On the way back he told an aide: "It's exactly like a meeting of gangsters. Everyone is putting his gun on the table, if you have no gun you are nobody. So we must have a nuclear programme."

Mendès France gave the order to start building bombs in December 1954. And as it built its arsenal, Paris sold material assistance to other aspiring weapons states, not just Israel. "[T]his went on for many, many years until we did some stupid exports, including Iraq and the reprocessing plant in Pakistan, which was crazy," Finkelstein recalled in an interview that can now be read in a collection of Cohen's papers at the Wilson Centre think-tank in Washington. "We have been the most irresponsible country on non-proliferation." In Dimona, French engineers poured in to help build Israel a nuclear reactor and a far more secret reprocessing plant capable of separating plutonium from spent reactor fuel. This was the real giveaway

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By the end of the 50s, there were 2,500 French citizens living in Dimona, transforming it from a village to a cosmopolitan town, complete with French lycées and streets full of Renaults, and yet the whole endeavour was conducted under a thick veil of secrecy. The American investigative journalist Seymour Hersh wrote in his book *The Samson Option*: "French workers at Dimona were forbidden to write directly to relatives and

friends in France and elsewhere, but sent mail to a phony post-office box in Latin America."

The British were kept out of the loop, being told at different times that the huge construction site was a desert grasslands research institute and a manganese processing plant. The Americans, also kept in the dark by both Israel and France, flew U2 spy planes over Dimona in an attempt to find out what they were up to. The Israelis admitted to having a reactor but insisted it was for entirely peaceful purposes. The spent fuel was sent to France for reprocessing, they claimed, even providing film footage of it being supposedly being loaded onto French freighters.

Throughout the 60s it flatly denied the existence of the underground reprocessing plant in Dimona that was churning out plutonium for bombs. Israel

refused to countenance visits by the IAEA, so in the early 1960s President Kennedy demanded they accept American inspectors. US physicists were dispatched to Dimona but were given the run-around from the start. Visits were never twice-yearly as had been agreed with Kennedy and were subject to repeated postponements. The US physicists sent to Dimona were

not allowed to bring their own equipment or collect samples. The lead American inspector, Floyd Culler, an expert on plutonium extraction, noted in his reports that there were newly plastered and

painted walls in one of the buildings. It turned out that before each American visit, the Israelis had built false walls around the row of lifts that descended six levels to the subterranean reprocessing plant.

As more and more evidence of Israel's weapons programme emerged, the US role progressed from unwitting dupe to reluctant accomplice. In 1968 the CIA director Richard Helms told President Johnson that Israel had indeed managed to build nuclear weapons and that its air force had conducted sorties to practise dropping them. The timing could not have been worse. The NPT, intended to prevent too many nuclear genies from escaping from their bottles, had just been drawn up and if news broke that one of the supposedly non-nuclear-weapons states had secretly made its own bomb, it would have become a dead letter that many countries, especially Arab states, would refuse to sign. The Johnson White House decided to say nothing, and the decision was formalised at a 1969 meeting between Richard Nixon and Golda Meir, at which the US president agreed to not to pressure Israel into signing the NPT, while the Israeli PM agreed her country would not be the first to "introduce" nuclear weapons into the Middle East and not do anything to make their existence public.

In fact, US involvement went deeper than mere silence. At a meeting in 1976 that has only recently become public knowledge, the CIA deputy director Carl Duckett informed a dozen officials from the US NRC that the agency suspected some of the fissile fuel in Israel's bombs was weapons-grade uranium stolen under America's nose from a processing plant in Pennsylvania. Not only was an alarming amount of fissile material going missing at the company, Numec, but it had been visited by a veritable who's-who of Israeli intelligence, including Rafael Eitan, described by the firm as an Israeli defence ministry "chemist", but, in fact, a top Mossad operative who went on to head Lakam. "It was a shock. Everybody was open-mouthed," recalls Victor Gilinsky, who was one of the American nuclear officials briefed by Duckett. "It was one of the most glaring cases of diverted nuclear material but the consequences appeared so awful for the people involved and for the US than nobody really wanted to find out what was going on."

The investigation was shelved and no charges were made. A few years later, on 22 September 1979, a US satellite, Vela 6911, detected the double-flash typical of a nuclear weapon test off the coast of South Africa.

The investigation was shelved and no charges were made. A few years later, on 22 September 1979, a US satellite, Vela 6911, detected the double-flash typical of a nuclear weapon test off the coast of South Africa. Leonard Weiss, a mathematician and an expert on nuclear proliferation, was working as a Senate advisor at the time and after being briefed on the incident by US intelligence agencies and the country's nuclear weapons laboratories, he became convinced a nuclear test, in contravention to the LTBT, had taken place.

It was only after both the Carter and then the Reagan administrations attempted to gag him on the incident and tried to whitewash it with an unconvincing panel of enquiry, that it dawned on Weiss that it was the Israelis, rather than the South Africans, who had carried out the detonation. "I was told it would create a very serious foreign policy issue for the US, if I said it was a test. Someone had let something off that US didn't want anyone to know about," says Weiss. Israeli sources told Hersh the flash picked up by the Vela satellite was actually the third of a series of Indian Ocean nuclear tests that Israel conducted in cooperation with South Africa. "It was a fuck-up," one source told him. "There was a storm and we

figured it would block Vela, but there was a gap in the weather – a window – and Vela got blinded by the flash."

The US policy of silence continues to this day, even though Israel appears to be continuing to trade on the nuclear black market, albeit at much reduced volumes. In a paper on the illegal trade in nuclear material and technology published in October 2013, the Washington-based ISIS noted: "Under US pressure in the 1980s and early 1990s, Israel ... decided to largely stop its illicit procurement for its nuclear weapons programme. Today, there is evidence that Israel may still make occasional illicit procurements – US sting operations and legal cases show this." Avner Cohen, the author of two books on Israel's bomb, said that policy of opacity in both Israel and in Washington is kept in place now largely by inertia. "At the political level, no one wants to deal with it for fear of opening a Pandora's box. It has in many ways become a burden for the US, but people in Washington, all the way up to Obama will

not touch it, because of the fear it could compromise the very basis of the Israeli-US understanding."

In the Arab world and beyond, there is growing impatience with the skewed nuclear status quo. Egypt in particular has threatened to walk out of the NPT unless there is progress towards creating a nuclear-free zone in the Middle East. The western powers promised to stage a conference on the proposal in 2012 but it was called off, largely at America's behest, to reduce the pressure on Israel to attend and declare its nuclear arsenal. "Somehow the kabuki goes on," Weiss says. "If it is admitted Israel has nuclear weapons at least you can have an honest discussion. It seems to me it's very difficult to get a resolution of the Iran issue without being honest about that."

Source: <http://iranian.com/posts/view/post/27147>, 18 January 2014.

OPINION – Meena Menon

A Change of Guard in Pakistan Stokes Nuclear Safety Fears

A cryptic message on 18 Dec 2013 announced a change of guard in the SPD, which marked the end of a long and distinguished career of its DG Lt. Gen. Khalid Ahmed Kidwai, whose name had become virtually synonymous with the nuclear weapons and strategy management of the country. He was replaced by Lt. Gen. Zubair Mahmood Hayat, corps commander Bahawalpur in one of the quieter moves by the Nawaz Sharif government, which has renewed the debate on the safety of Pakistan's growing nuclear arsenal. An oft quoted news report described Hayat as "brainy, brave and bold" and that he was commissioned in the Artillery regiment in the 80s. The new SPD chief has a tough challenge ahead to reorient the organisation in testing times.

As a measure of Lt. Gen. Kidwai's crucial importance, it was the outgoing SPD chief who briefed Chief of Army Staff Gen. Raheel Sharif during his visit to the institution. Gen. Sharif in a statement said that Pakistan's nuclear programme occupied a central place for the defence of the country. Lt. Gen. Kidwai headed SPD since its inception in 1999 and turned it

into a "true nuclear conclave" as described by Feroze Hasan Khan in his book *Eating Grass: The Making of the Pakistani Bomb*. Lt. Gen. Kidwai is quoted in the book as saying that no delegation of authority concerning nuclear weapons is planned, during a lecture in the U.S. in 2006 but already there are reports from the US media expressing concern over his exit after some 12 extensions and the biggest fear is that nuclear weapons could fall into the wrong hands.

When a similar atmosphere of distrust prevailed in 2008, Lt. Gen. Kidwai had invited the foreign press for an extraordinary briefing which included two Indian journalists. At that time he had reassured everyone that the country's strategic assets were in safe hands and that there was "no conceivable scenario" in which they could fall into the hands of extremists. He said there was "no chance that one day there will be a DG SPD here with a long beard who will be controlling everything." But the world

community now will need much more than assurances and it is not for nothing that the U.S. has reportedly increased surveillance over Pakistan, according to information from whistleblower Edward Snowden which has been refuted by the federal government here.

Michael Kugelman in a recent article in *The National Interest* titled "One More Reason to worry about Pakistan's Nukes" asks the question, "Is anyone other than Khalid Kidwai capable of managing Pakistan's nuclear

security challenges, given their sheer magnitude?" Stating that there is good reason to be anxious about Lt. Gen. Kidwai's departure, he adds that "Few countries are as prone to a nuclear crisis as Pakistan – and this threat could well rise in 2014. The withdrawal of international forces from Afghanistan portends heightened competition between Pakistan and India for influence in Afghanistan. The US troop withdrawal also deprives militants of a prime target, increasing the likelihood that some jihadists – including those with ties to Pakistan's security establishment – will launch new campaigns of violence in India. These scenarios could

The withdrawal of international forces from Afghanistan portends heightened competition between Pakistan and India for influence in Afghanistan. The US troop withdrawal also deprives militants of a prime target, increasing the likelihood that some jihadists – including those with ties to Pakistan's security establishment – will launch new campaigns of violence in India. These scenarios could dangerously escalate India-Pakistan tensions, and conceivably trigger armed mobilisations that include TNW.

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In 2012, security authorities acknowledged a “serious threat” from the Pakistani Taliban to attack one of Pakistan’s largest nuclear installations,” he points out. However, Pakistan has repeatedly emphasised the safety of its nuclear installations and its credible minimum deterrence policy. Central Information Secretary of the Pakistan Tehreek-e-Insaf Shireen Mazari, slammed “the US media campaign launched once again against Pakistan’s nuclear weapons.” Lt. Gen. Talat Masood, chief coordinator of the think tank Pugwash told *The Hindu* that fears of nuclear weapons falling into the wrong hands was always there but comments are being made by people who don’t understand Pakistan and equate the nuclear with the conventional weapons set-up. There can be no change as far as safety issues are concerned and the new DG will be even more careful. Even if the control of the nuclear weapons is with the military there is a separate command and control structure protected by a separate force, physically and technology wise and it was secure, he said.

The government relies on the new DG and the military leadership had recommended him and SPD had grown into a mature institution, he pointed out. “Kidwai had a long and productive innings and enjoyed the confidence of both the civil and military leadership and we need to acknowledge his contribution to the nuclear establishment,” he added. In a 2014 report by the NTI, in a list of 25 countries Pakistan has been ranked 22 and India 23 in terms of security of nuclear materials with scores of 46 and 41 respectively. While India has criticised the basis of the report, it says, “Among nuclear-armed states, Pakistan is most improved through a series of steps to update nuclear security regulations and to implement best practices, though it ranks 22nd overall.”

However, in terms of security control measures, India ranks the lowest below Pakistan among the 25 nuclear countries with weapons-usable nuclear materials. Pakistan is lowest in the ranking for risk environment with 19 points out of 100. In the 2014 *NTI Index*, the scores of the nine nuclear-armed

states remained mostly static, with some states’ scores increasing or decreasing by a single point. Pakistan was a notable exception, with its score increasing by three points compared with 2012, and it demonstrated the largest improvement of any nuclear-armed state, the report said.

Pakistan is taking steps to update its nuclear security regulations and to implement nuclear security best practices. In particular, new regulations have improved its scores in the On-Site Physical Protection indicator. Pakistan also participated in new bilateral and multilateral assistance, although its score for Voluntary Commitments was already high. Despite those positive developments, Pakistan must still improve its regulations for physical protection, control and accounting, and insider threat prevention, the report said. And that will be the big challenge for the SPD’s new chief who has his task cut out for him.

Source: *The Hindu*, 17 January 2014.

OPINION – Amy Goodman

Fukushima is an Ongoing Warning to the World on Nuclear Energy

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“I write these facts as dispassionately as I can in the hope that they will act as a warning to the world,” wrote the journalist Wilfred Burchett from Hiroshima. His story, headlined, “The Atomic Plague” appeared in the *London Daily Express* on 5 Sept 1945. Burchett violated the

US military blockade of Hiroshima, and was the first Western journalist to visit that devastated city. He wrote: “Hiroshima does not look like a bombed city. It looks as if a monster steamroller had passed over it and squashed it out of existence.” Jump ahead 66 years, to 11 March 2011, and 600 miles north, to Fukushima and the Great East Japan Earthquake, which caused the tsunami.

As we now know, the initial onslaught that left 19,000 people dead or missing was just the beginning. What began as a natural disaster quickly cascaded into a man-made one, as system after system failed at the Fukushima Daiichi nuclear power plant. Three of the six reactors suffered meltdowns, releasing deadly radiation into the atmosphere and the ocean. Three years later, Japan is still reeling from the impact of the disaster. More

than 340,000 people became nuclear refugees, forced to abandon their homes and their livelihoods. Filmmaker Atsushi Funahashi directed the documentary "Nuclear Nation: The Fukushima Refugees Story." In it, he follows refugees from the town of Futaba, where the Fukushima Daiichi plant is based, in the first year after the disaster. The government relocated them to an abandoned school near Tokyo, where they live in cramped, shared common areas, many families to a room, and are provided three box lunches per day. I asked Funahashi what prospects these 1,400 people had. "There's none, pretty much. The only thing the government is saying is that [for] at least six years from the accident, you cannot go back to your own town," he told me.

The refugees were given permits to return home to collect personal items, but only for two hours. Like Wilfred Burchett, Funahashi had to violate the government's ban on travel to a nuclear-devastated area in order to catch the poignant moments of one family's return on film. He explained how the family gave him one of their four permits to take the trip: "I tried to negotiate with the government, and they didn't give me any permission to go inside there. And no other independent journalist or documentary filmmakers got permission to go inside. But I got along very well with this family from Futaba," he explained, and sneaked back on their short trip. The government's refusal to grant Funahashi access is indicative of another significant problem that has emerged since the earthquake: secrecy. Japan's conservative PM, Shinzo Abe, enacted a controversial state secrecy law early 2013 December.

...

Since the nuclear disaster, a forceful grass-roots movement has grown to permanently decommission all of Japan's nuclear power plants. The PM at the time of the earthquake, Naoto Kan, explained how his position on nuclear power shifted: "My position before March 11th, 2011, was that as long as we make sure that it's safely operated, nuclear power plants can be operated and should be operated.

However, after experiencing the disaster of March 11, I changed my thinking 180 degrees, completely

... there is no other accident or disaster that would affect 50 million people –maybe a war, but there is no other accident can cause such a tragedy," he said. PM Abe, leading the most conservative Japanese administration since WWII, wants to restart his country's nuclear power plants, despite overwhelming public opposition. Public protests outside Abe's official residence in Tokyo continue. "It gives you an empty feeling in the stomach to see such man-made devastation," Wilfred Burchett wrote, sitting in the rubble of Hiroshima in 1945. The two US atomic-bomb attacks on the civilian populations of Hiroshima and Nagasaki have deeply impacted Japan to this day. Likewise, the triple-edged disaster of the earthquake, tsunami and ongoing nuclear disaster will last for generations. The dangerous trajectory from nuclear weapons to nuclear power is now being challenged by a popular demand for peace and sustainability. It is a lesson for rest of the world as well.

Source: <http://www.theguardian.com/commentisfree/2014/jan/16/fukushima-is-a-warning>, 15 January 2014.

OPINION – Christian Conroy

China's Nuclear Parasol

Beijing offers a "nuclear security guarantee" to the Ukraine. How does that fit with its nuclear doctrine? Discussion of a "nuclear umbrella" in the Asia-Pacific has traditionally referred to the US strategy of extending nuclear security assurances to non-nuclear weapons states such as Japan, Taiwan and South Korea. From the Chinese perspective, the concept of the "nuclear umbrella" has been relevant only in that China's growing nuclear potential is a perpetual motivation for US extended deterrence guarantees in Asia.

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On 12 Dec 2014, however, the *Washington Times* reported that China had turned the tables and opened a nuclear umbrella of its own. In early December, Ukrainian President Viktor Yanukovich and Chinese President Xi Jinping signed a bilateral treaty and issued a joint statement that said "China pledges unconditionally not to use or threaten to use nuclear weapons against the nuclear-free Ukraine and China further pledges to provide

Ukraine nuclear security guarantee when Ukraine encounters an invasion involving nuclear weapons or Ukraine is under threat of a nuclear invasion.”

From a tactical perspective, Beijing benefits from the pact in the form of both Kiev’s official opposition to calls for Taiwanese independence and continued economic and military cooperation between the two countries. In recent years, Ukraine has provided China with the Zubr-class amphibious hovercraft, the Soviet Varyag aircraft carrier (refurbished into China’s Liaoning aircraft carrier), and hundreds of Russian-made aircraft engines. The partnership guarantees that Ukraine will continue to provide China with military technology and technical expertise as Beijing continues military modernization efforts.

The initial reporting of the pact by Xinhua, China’s state-run news agency, did not use the phrase “nuclear umbrella,” but instead said that through the pact, China is providing Ukraine with a “security guarantee.” According to Wu Dahui, a professor at the Department of International Relations at Tsinghua University in Beijing, the agreement signed in December does not represent a departure from China’s 1994 pledge that it would not use or threaten to use nuclear weapons against Ukraine. According to Wu, the parallels Western commentators are drawing between the wording of the agreement and the “nuclear umbrella” the US extends to its allies in the Asia-Pacific represents a misunderstanding. The security guarantee of the new pact is simply a manifestation of Beijing’s global nonproliferation responsibilities enshrined under the Nuclear Non-Proliferation Treaty.

There is no question that China recognizes value in the concept of a nuclear umbrella. According to Major General Zhu Chenghu, a professor at China’s National Defense University in Beijing, by extending a nuclear umbrella to Ukraine, North Korea, Iran, Myanmar and other countries, China can promote norms of international nonproliferation while

simultaneously increasing regional stability. From Beijing’s perspective, a nuclear umbrella could

potentially stave off a potentially destabilizing regime collapse in Pyongyang, guarantee a strategic buffer between China and US forces in South Korea, and demonstrate Chinese independence on the global stage. China’s state-run *People’s Daily* argued that a Chinese nuclear umbrella over Ukraine will allow China to

further resist US efforts at nuclear blackmail and coercion, a fundamental component of China’s stated nuclear doctrine.

These tactical benefits of a Chinese nuclear umbrella are overshadowed by the strategic challenges that would arise, particularly if Beijing were to extend nuclear security assurances to Ukraine. First, any nuclear crisis involving Ukraine would likely emanate from Russia. Trade between China and Russia is expected to reach \$100 billion by 2015 and Chinese President Xi Jinping has even characterized the Sino-Russia relationship as the “best” among major countries. Therefore any consideration of a nuclear response to a Russian attack on Ukraine would place China in a difficult strategic conundrum.

Second, extending a nuclear umbrella to the Ukraine would require China to abandon its long-standing policy NFU nuclear pledge, which stipulates that China will not be the first to use nuclear weapons under any circumstances. Responding to a

nuclear invasion or threat of nuclear invasion directed at Ukraine would require China to violate NFU. Despite continued Western skepticism over China’s commitment to the pledge, NFU has been a fundamental component of China’s nuclear posture since the country first tested a nuclear weapon in 1964. Chinese leadership has traditionally viewed the NFU pledge not as a self-imposed constraint, but rather as a statement about the fundamental role of nuclear weapons.

There is also the question of whether a Chinese nuclear umbrella over Ukraine would be

From Beijing’s perspective, a nuclear umbrella could potentially stave off a potentially destabilizing regime collapse in Pyongyang, guarantee a strategic buffer between China and US forces in South Korea, and demonstrate Chinese independence on the global stage.

Chinese nuclear umbrella over Ukraine will allow China to further resist US efforts at nuclear blackmail and coercion, a fundamental component of China’s stated nuclear doctrine.

characterized by the same logic of conventional-nuclear ambiguity that defines Beijing's own deterrence posture. Under the strategy advanced by former President Hu Jintao, Beijing endorses three components related to conventional-nuclear balance: dual deterrence, dual operations and dual command. With the line between conventional and nuclear attack blurred under such a policy, the threshold at which China would respond to military aggression directed at Ukraine is unclear. Were relations between Russia and Ukraine to deteriorate into large-scale conventional conflict in the future, China's dual posture may force Beijing to ponder a nuclear response. On the other hand, faced with such military aggression from Russia, the Chinese nuclear umbrella over the Ukraine could fold in the face of much larger strategic concerns.

It is conceivable that China could further international non-proliferation goals by extending a "nuclear umbrella" in the same fashion in which the US extends nuclear security assurances to Japan, South Korea and Taiwan. However, China's fundamental nuclear doctrine – characterized foremost by NFU, dual deterrence, and a minimum deterrence posture based on a small nuclear arsenal – would face the prospect of radical reform were the concept of the "nuclear umbrella" to be adopted in Beijing.

Source: <http://thediplomat.com/2014/01/chinas-nuclear-parasol/>, 26 January 2014.

NUCLEAR STRATEGY

CHINA

Chinese Defense Ministry Confirms Hypersonic Missile Test

China's Defense Ministry on 15 Jan 2014 confirmed that weapons designers recently conducted the first test of an ultra-high speed missile vehicle

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considered cutting edge military technology. In a two-sentence statement faxed to news agencies and state-run media in Beijing, the ministry confirmed the flight test of a new hypersonic glide vehicle. US defense officials said the test of what the Pentagon is calling the WU-14 hypersonic glide vehicle took place 9 Jan 2014 over China. The ministry confirmed the test after it was first reported by the *Washington Free Beacon* 13 January 2014. "Our planned scientific research tests conducted in our territory are normal," the ministry said in the statement. "These tests are not targeted at any country and at any specific goals."

China military affairs analysts said the hypersonic vehicle test represents a major milestone in China's military build-up of weapons it calls "assassin's mace" arms – weaponry designed to allow a weaker power to defeat a stronger one. Officials familiar with some details of the hypersonic glide vehicle

The hypersonic test highlights a new trend in Chinese transparency. Chinese experts have in the past emphasized transparency of intent over capabilities. However, China has increasingly become a country of transparency through display of capabilities rather than intent. This has occurred in a range of areas from anti-satellite and ballistic missile defense tests to unveiling of stealth fighters and unmanned air vehicles. This is China's new form of transparency.

test said the high-speed glider appears designed to fit on top of an ICBM. Using that booster, the vehicle is lofted to a height of 62 miles or less and then released. It then maneuvers at speeds as high as Mach 10, or 7,680 miles per hour, to its target. US missile defenses are designed to counter hypersonic targets, namely ballistic missile warheads. What is different about the hypersonic vehicle is that its trajectory does not enter space, and that makes it more difficult to detect, track, and intercept with a missile defense interceptor. ...

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of transparency. It suggests that China's official statements, white papers, and posture declarations are lagging behind its military developments." ... A former commander of Russia's strategic nuclear forces in Moscow said China's hypersonic vehicle test was a milestone but that Beijing trails both Russia and the US in the development of the arms.

Source: The Washington Free Beacon, 15 January 2014.

PLA Could Be Defeated in an Hour in Nuclear War with US: Report

The PLA could be defeated in a potential nuclear war between China and the US in just one hour, according to the Moscow-based Expert magazine. Military experts around the world have claimed that the US should not underestimate the nuclear capability of the SAC, China's strategic missile force. The magazine said however that many of the technologies used by the PLA today come from the former Soviet Union. The report added that China's most advanced technology still comes from nuclear experts from Russia and Ukraine who defected after the collapse of the Soviet Union in 1991.

China has yet to build a three-pronged nuclear capability that could challenge the US, consisting of strategic bombers, ICBMs and SLBMs. The SAC is also unable to compete against the US in the number of nuclear warheads it has, the report said, adding that China would likely lose a full scale nuclear war in less than an hour. Vasily Kashin from the Moscow-based CAST said that the DF-5 missiles currently equipped by the SAC are capable of striking continental US. However, it will take the PLA at least two hours to fire this fragile liquid-fuelled missile, which means that it can be easily wiped out by the enemy even before its launch. China's DF-4 missile, meanwhile, has a range of 5,500 kilometers but cannot reach the US, Kashin said.

The magazine reported that China is developing the DF-31A – a road-mobile, solid propellant ICBM with a range of 11,000 kms. It will be able to target key cities on the West Coast of the US, including Los Angeles. However, the US has at least 2,000 advanced

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ICBMs with similar capabilities to the DF-31A. In addition, both the DF-31 and DF-31A are limited to one nuclear warhead. Sources claim that China is now devoting resources to the development of the DF-41, which will have a range of 14,000 kms. A single DF-41 is capable of carrying multiple nuclear warheads, the Expert said, adding that the new missile will not begin service with the PLA in the foreseeable future. It takes between 20 and 30 years for China to deploy its ICBMs to the frontline after

the first test launch of the missile, according to the magazine. As for China's new Type 094 Jin-class SSBN, the Expert stated that it is equipped with a JL-2 missile with a range of 8,000 kms. Analysts from the Pentagon said that the capability of Type 094 is only comparable to the submarines of the Soviet

Union in 1970s, however.

In addition, it will take another five years for the first Jin-class submarine to begin service with the PLA Navy. Meanwhile, China also has a regiment of H-6K strategic bombers based on the design of the Soviet Union's Tupolev Tu-16 jet bomber, which was first produced in the 1950s. The H-6K has been upgraded with D-30KP engines and CJ-10 cruise missiles, but the country is still unable to develop a smaller nuclear warhead to be loaded aboard the strategic bomber, the magazine said.

Source: Want China Times, 22 January 2014.

INDIA

Agni-IV Missile Successfully Test Fired

This was the third success in a row for Agni-IV. Its first success came in November 2011 and the second in September 2012.

India's nuclear deterrence programme received a boost on 20 January 2014 when its Agni-IV, a surface-to-surface missile with a range of about 4,000 km, was successfully test-fired from the Wheeler Island, off the Odisha coast. The Agni-IV is a strategic missile which can carry a nuclear warhead weighing one ton. The DRDO, which developed the missile, did the test-firing. This was the third success in a row for Agni-IV. Its first success came in November 2011 and the second in September 2012. Avinash Chander, SA to the Defence Minister and DRDO DG, said "the mission

went off perfectly well" with Agni-IV reaching a height of about 850 km and achieving its full range of 4,000 km. The success "opens a new missile ready for induction" into the Army, he said. A team from the Army "participated in the launch and was involved in all preparations for the launch," he added. The missile would be handed over to the user now and its serial production would start.

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Mr. Chander said the success had ramped up the nation's "deterrence to a higher level of preparedness and effectiveness." The missile was fired from a road-mobile launcher. This meant it "can be moved anywhere in the country and this is its main strength." Radar stations at Port Blair, Chandipur, Balasore and Pardip tracked the missile's entire trajectory including the terminal event, that is, the detonation of the warhead. Asked whether the missile had a dummy warhead in this flight, Mr. Chander said it carried "the entire warhead minus the nuclear part." Ravi Gupta, Director, PI, DRDO, said the launch took place at 10.52 a.m. and the flight lasted about 20 minutes. The missile's terminal event took place over the Indian Ocean. Agni-IV is a two-stage missile. It weighs 17 tons and is 20 mts long. Senior officers from the Odisha Government watched the launch from the Wheeler Island.

"The state-of-the-art Ring Laser Gyros based high accuracy INS and MINGS complementing each other in redundant mode have been incorporated into the missile system in guidance mode," DRDO sources said. The sophisticated missile is lighter in weight and has two stages of solid propulsion. The payload, with a re-entry heat shield can withstand temperature of more than 3000 degree Celsius, a defence scientist said.

Source: The Hindu, 20 January 2014.

N-Missile Sub to Start Sea Trials within Weeks

India is set to test its first ever nuclear missile submarine within a matter of weeks, finally completing the nuclear triad – the capability of launching strategic weapons from ground, air and

underwater. The INS Arihant, India's first home grown submarine, will be launched for sea tests within months, it is learnt. 'A top Navy officer has said INS Arihant will provide teeth to the strategic forces. "The INS Arihant will provide us with the option for sea-based strategic deterrence, the third

leg of the triad," Assistant CNS (Submarines) Rear Admiral L Sarat Babu said. Sources said once the trials begin, the submarine will be mated with the K 15 submarine launched ballistic missile and the first test launch will be undertaken. While the K 15 has been launched successfully from an underwater pontoon, the nuclear-capable missile is yet to be proven from the Arihant. The Indian submarine, which has been developed with the help of Russian designers, achieved criticality of its nuclear reactor in August 2013 and had been scheduled to go in for sea trials by December 2013. This, sources said, has now been shifted to early this 2014 and the submarine would be in trials within a month.

Source: Indian Express, 22 January 2014.

BALLISTIC MISSILE DEFENCE

ISRAEL

Missile Defense Expert Warns of Growing Strategic Threat

Israel's enemies are arming themselves with precision-guided heavy rockets and will inevitably come to possess GPS-guided ballistic missiles, an architect of the Israeli missile defense program warned on 15 Jan 2014. Speaking at a conference called Missile Defense: Asset or Liability for Regional and International Stability, held at the INSS in Tel Aviv, Dr. Uzi Rubin warned that the growing threat is strategic, not merely tactical. Rubin, who founded and directed the Defense Ministry's IMDO, and ran the Arrow program, said that "Iran possess over 400 ballistic missiles that can reach Israel, with warheads of 750 kgs. Syria possesses 200 to 300" such missiles, having used up part of its arsenal in its civil war, he added. Syria and Hezbollah have thousands of heavy

once the trials begin, the submarine will be mated with the K 15 submarine launched ballistic missile and the first test launch will be undertaken. While the K 15 has been launched successfully from an underwater pontoon, the nuclear-capable missile is yet to be proven from the Arihant

rockets, and tens of thousands of light rockets, Rubin continued. "That's the bad news. The worse news is that these rockets are being turned into smart rockets. The Iranians took the Zilzal 2 and turned it into a guided rocket. The third generation of it contains a homing sensor and a GPS. The Syrians can have this capability too, to create a fully guided M-600 rocket with GPS. Hezbollah probably has these," he said.

The M-600 carries a 500-kg warhead, and a guided version of it would be a devastating weapon, Rubin warned. He showed a photograph of Tel Aviv and the Defense Ministry/IDF GHQ site, the Kirya, saying one M-600 strike could collapse half

of the area. "That would change the skyline of Tel Aviv. This is not a tactical threat, it's not harassment. This is a strategic threat. Even worse news is coming; ballistic missiles are becoming smart," he said. In the next five to 10 years, Israel's enemies will inevitably arm themselves with GPS-guided ballistic missiles such as Scuds, he said. ...

In such a scenario, the IDF would not be able to use its missile defenses to protect the general population, but rather, they would primarily be employed to "preserve Israel's capability to fight a war, and save lives as far as possible. Priorities will inevitably change," he said. The introduction of nuclear weapons would not replace conventional threats, but create an additional layer of nonconventional ballistic threats, Rubin said. Missile defenses already in place could intercept incoming nuclear missiles, he added. "Anything that can intercept a missile from Iran doesn't give a damn if it's nuclear or nonnuclear. Missile defense systems don't distinguish between warheads." The upper atmosphere Arrow 2 system, and the more efficient Arrow 3 interceptor, which operates in space, will constitute the defensive against any nuclear attacks.

Source: Yaakov Lappin, <http://www.jpost.com/Defense/Precision-guided-rockets-missiles-becoming-strategic-threat-architect-of-missile-defense-system-warns-338299>, 01 January 2014.

Israeli Company to Roll Out Defense System that Incinerates Incoming Rockets Midair Using Lasers

An Israeli defense contractor says it plans to reveal a new missile defense system based on lasers that are designed to heat and blow up incoming warheads, the latest answer to Israel's growing concerns about regional instability. At a conference next month in Singapore, Rafael Advanced Defense Systems, Ltd will unveil the system – Iron Beam – a "High Energy Laser based system Against Rockets, Mortar and Airborne Target Attacks," the company announced on its website.

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According to the website Israel Defense, the objective of the system is to combat rockets and mortars that are fired from short distances which Israel Defense Forces' Iron Dome anti-missile batteries are unable to knock out of the sky. "The system would be most relevant to the Negev town of Sderot, which is situated less than four kms from Gaza and, therefore, largely unprotected by Iron Dome," the Times of Israel noted. Residents of the embattled border town have noted that they sometimes have only seconds to find shelter when an alert of an incoming rocket is issued.

"The system is designed to deal with threats that fly on too small a trajectory to be engaged efficiently by Iron Dome, the Israeli interceptor

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credited with an 80 % success rate against rockets fired by Palestinian militants," Reuters reported, citing information provided by an unnamed Israeli defense official. "While Iron Dome launches radar-guided interceptor rockets, Iron Beam's laser will super-heat the warheads of shells with ranges of up to 7 km," it added. The latest anti-rocket system is part of a multi-tiered approach to missile defense which includes the Iron Dome, David's Sling for medium range missiles and the Arrow 2 and Arrow 3 which are designed to intercept ballistic missiles while still in the atmosphere. *The Times of Israel* reported that each Iron Dome interceptor costs around \$100,000;

but firing a laser beam would have a much lower price tag. As *The Blaze* reported, 20 rockets have been fired by Palestinian terror groups in Gaza toward Israel during the month of January 2014 so far, prompting Israeli Air Force strikes on three targets in Gaza on 19 January 2014. ...

Source: *The Blaze*, 19 January 2014.

NUCLEAR ENERGY

CHINA

New Reactor Design Taking Shape in China

The basic design for China's CAP1400 reactor has been approved ahead of construction of the first two units, which is set to start at Shidaowan in April 2014. The CAP1400 is an enlarged version of the AP1000 PWR developed from the Westinghouse original by SNPTC with consulting input from the American company. As one of China's 16 strategic projects under its NSTD Plan, the CAP1400 is intended to be deployed in large numbers across the country. SNPTC said it would have 'independent IPR' over the design, paving the way for exports to other countries - a commercial possibility SNPTC will explore in 2014.

A meeting in Beijing in the first week of January 2014 saw the NEB grant its preliminary approval for the CAP1400 design, which was said to be about 60% complete. The design will reach completion when site specific aspects are taken into account during construction, slated to begin by the end of April 2014. About 80% of components for the first two CAP1400s will be made in China. Site preparation is well already underway for two demonstration CAP1400 units at Huaneng Group's Shidaowan site in Shandong province. This site is part of a larger Rongcheng Nuclear Power Industrial Park, at which the prototype HTR-PM small modular reactor is already under construction. Another 19 of the 210 MWe units could follow. Huaneng is China's largest power generation

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State-owned China General NPC (CGN) will put another five reactors into operation this 2014, increasing its total electricity capacity by over two-thirds from a year ago to 14 GW.

China's plans to increase its reliance on nuclear power have turned it into one of the few growth areas for the industry as countries like Germany and Italy phase out their nuclear plants in the wake of Japan's 2011 Fukushima disaster.

company. The reactors at Shidaowan will be its first nuclear generation assets.

Source: *World Nuclear News*, 15 January 2014.

China General Nuclear to Start Up 5 New Reactors in 2014

State-owned China General NPC (CGN) will put another five reactors into operation this 2014, increasing its total electricity capacity by over two-thirds from a year ago to 14 GW, the company said on 15 January 2014. CGN is one of two state-owned nuclear power conglomerates that are pressing ahead with an ambitious reactor-building programme that is part of China's efforts to diversify energy sources and ease its dependence on coal. China's plans to increase its reliance on nuclear power have turned it into one of the few growth areas for the industry as countries like Germany and Italy phase out their nuclear plants in the wake of Japan's 2011 Fukushima disaster. "Whether you look at the US or France's nuclear development, no other country has ever put five nuclear units into operation in a single year, and there will certainly be a lot of challenges," Xia Linqun, vice-general manager of CGN's engineering unit, told a media briefing.

There are currently 17 reactor units in commercial operation in China, with a total capacity of 14.6 GW. CGN, based in the southern Guangdong province, has a total of eight fully operational units, and rival CNNC controls the rest. China aims to boost total nuclear capacity to 50 GW by 2017 from 14.61 GW at the end of 2013, according to a 2013 pollution action plan. CGN began construction on another 4.5 GW of new nuclear capacity in 2013, bringing its total fleet in operation and under construction to 17.4 GW, its

spokesman Hu Guangyao was quoted by the state news agency Xinhua as saying. After the Fukushima crisis, China said it would use safer "third-generation" reactors, and would be the first country to build the AP1000, designed by Westinghouse, the nuclear unit

of Japan's Toshiba Corp. In the second week of January 2014, the NEA approved preliminary designs for China's own third-generation nuclear reactor, known as the CAP1400. Construction of the reactor, which is based on the Westinghouse model, will start in the eastern coastal province of Shandong 2014. China is also building two third-generation EPR designed by France's Areva.

Source: Reuters, 15 January 2014.

GENERAL

ITER Nuclear Fusion Reactor Enters Key Phase

The world's biggest energy research project, the \$20bn ITER nuclear fusion reactor, entered a key construction phase on December 2013, as contractors began to pour 15,000 cubic mts of concrete into a pit in the south of France. It will house a huge doughnut-shaped machine, where scientists hope to tame the fusion reaction that powers the sun as a source of clean energy on Earth. ITER is the standard bearer in a quest to generate power by fusing together the nuclei of hydrogen atoms, which dates back to the years after the WWII. This turned out to be far harder than it was to exploit fusion in explosive form in the H-bomb. Because the potential benefits of fusion power are so great – it produces far less radioactive waste than nuclear fission (splitting heavy atoms such as uranium) and its raw materials are almost inexhaustible – the industrialised world has persisted in the costly quest, in the face of sceptics who claim that its commercial application will always lie half a century in the future.

The ITER project was born at the Geneva Superpower Summit in 1985, when Mikhail Gorbachev of the Soviet Union and Ronald Reagan of the US agreed to launch an international initiative aimed at developing fusion energy for peaceful purposes.... Since construction started in 2010, the project has fallen further behind the original

The latest design changes – adding more magnetic coils inside the reactor to control the plasma and lining the vessel with metal (tungsten and beryllium) instead of carbon – are intended to smooth the way to its successful production of fusion energy.

“plasma” of reactants, burning at 150m degrees and generating 500MW of energy – comparable to a medium-sized power station – for several minutes at a time. ...

The latest design changes – adding more magnetic coils inside the reactor to control the plasma and lining the vessel with metal (tungsten and beryllium) instead of carbon – are intended to smooth the way to its successful production of fusion energy. Meanwhile, tests elsewhere are contributing invaluable data. The JET, an EU facility hosted by the UK Atomic Energy Authority at Culham, Oxfordshire, is the most important, because it is the world's

The next step beyond ITER will be DEMO, a similar sized machine likely to be built in Asia. Its job will be to demonstrate sustained large-scale production of electric power and self-sufficiency in tritium fuel. If all goes well – politically and financially as well as technically – DEMO will be designed as ITER is running, in the hope that it could begin operations in the 2030s and feed fusion power into an electric grid in the early 2040s.

largest existing fusion reactor and the closest to ITER in design. JET has been running for more than 30 years, but still has several years working life. Its greatest moment so far came in 1997 when it created a world record 16MW of fusion power in short bursts of up to a second. Since then, experiments at JET have used non-reactive hydrogen to test plasma physics, systems and materials for ITER. But Steven Cowley, UKAEA chief executive, is looking forward to another power-generating run with deuterium-tritium fuel in two or three years. “We are planning to break our world record by sustaining a fusion output of perhaps 20MW for six or seven seconds,” he says.

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grid in the early 2040s. The ITER approach of magnetic confinement, confining the D-T fuel within an extremely powerful magnetic field, is the most generously funded fusion technology but not the only one. An alternative approach, called inertial confinement, involves focusing an array of ultra-powerful lasers or ion beams on a small pellet of D-T fuel – though its showcase, the US National Ignition Facility in California, is making progress more slowly than expected. It remains to be seen whether fusion will confound the sceptics and meet what is likely to be a desperate need for clean, affordable power in the late 21st century. But the world's leading industrial powers judge the prospect of success to be high enough to justify many billions of dollars further investment.

Source: Financial Times, 17 January 2014.

INDIA

Kudankulam Nuclear Power Plant Second Unit Likely to Go Critical by June

The 1000 MW second unit of the KNPP is likely to attain criticality by June 2014, nearly a year after the first reactor crossed the milestone, according to a top AEC official.

... AEC Chairman Ratan Kumar Sinha told reporters at the airport here 16 January 2014.

The country's first 1,000 MW PWR of the Indo-Russian joint venture project attained criticality (start of nuclear fission process) in July 2103 and commenced electricity generation in October 2013. Presently it is producing over 400 MW. Stating that the generation in the first unit will reach its full capacity soon, Sinha said Tamil Nadu would get "all of its share." Referring to the anti-nuclear protests against KNPP in the last two years, he said the intensity had come down following efforts by authorities to educate people about the safety of the plant. ... Union Minister V Narayanasamy had in the first week of January said the second unit of the KKNPP would start generating electricity from September 2014.

Source: The Economic Times, 16 January 2014.

VIETNAM

Vietnam Likely to Delay Construction of 1st Nuclear Power Plant

The construction of the first nuclear power plant in Vietnam is likely to be delayed until 2020 instead of its previous schedule in 2014. Le Tuan Phong, deputy director general of the general directorate of energy under Vietnam's ministry of trade and industry, said on *Tuoitre* online newspaper on 17 January 2014 that in order to ensure the safety and efficient exploitation of the nuclear power plant, the MoIT is considering to propose the government to postpone the project. An examination report by the Vietnamese NA committee on science, technology and environment over the implementation of national key projects revealed that the construction of Ninh Thuan 1 plant is likely to be three years later than scheduled. ...

Nguyen Cuong Lam, deputy director of the EVN and director of the management board of the Ninh Thuan nuclear power plant, told *Tuoitre* on 17 January 2014 that the project of Ninh Thuan 1 nuclear power plant was not mentioned in the list of national power projects to be operated in 2020 as approved by the PM in late 2013. According to the NA's committee on science, technology and environment, in 2009, Vietnam's NA approved the roadmap for the construction of Ninh Thuan 1

The project was scheduled to start in 2014 and to be commissioned by 2020. However, the committee said that in 2014, the Ninh Thuan 1 project can only start with construction of infrastructure items including roads, electricity and water supply. The construction of reactors can only be started at the end of 2017 and early 2018 when the technical designs of the plant are approved and licensed.

nuclear power plant in Ninh Thuan province, some 1,100 km south of capital Hanoi. The project was scheduled to start in 2014 and to be commissioned by 2020. However, the committee said that in 2014, the Ninh Thuan 1 project can only start with construction of infrastructure items including roads, electricity and water supply. The construction of reactors can only be started at the end of 2017 and early 2018 when the technical designs of the plant are approved and licensed.

Do Manh Hung, deputy chairman of NA's committee on social issues told *Tuoitre*, quoting the information delivered by the MoIT that the slow progress of the project was attributed to the issues arising in the process of site selection which prolonged the approval of location to over two

years. Tuoitre also quoted Do Huu Nghi, vice chairman of Ninh Thuan provincial people's committee as saying that so far, there is no specific location for the construction of the Ninh Thuan 1, therefore the work of resident relocation is still suspended. Earlier, during the visit of Yukiya Amano, general director of IAEA to Ninh Thuan in Jan. 10, the IAEA chief said there should be good preparation for safety, security and sustainability of the construction of the nuclear power plant and the country should not be hurried. Ninh Thuan 1, set to be Vietnam's first nuclear power plant, is to be built in collaboration with Russian company Atomstroyexport.

Source: Xinhua, 17 January 2014.

Japan is expected to restart several of its 50 idle nuclear reactors in 2014, which should signal a big confidence boost for nuclear energy. While the process for restart approval is very tedious and slow-moving it seems almost certain that at least a few reactors will be back on 2014. We may also see a supply-demand imbalance in 2014 as global demand for uranium is expected to continue to grow and new uranium projects are delayed due to poor economics.

3.6 million pounds of uranium at an average cost of \$16.57 per pound during Q3, 2013.

The crux of Cameco's contracting strategy is a mix of long term and short term contracts, which allow it to remain profitable even when the spot price of uranium is low. Many of Cameco's long term supply contracts are based on the long-term price of uranium, which is currently substantially higher than the spot price, allowing Cameco to continue to be profitable. Cameco also strives for a ratio of 40% fixed-price contracts and

60% market-related contracts, meaning Cameco benefits when the spot price rises, but protects itself and remains profitable when the spot price falls. Cameco will benefit even more if several near term and longer term catalysts drive the spot price of uranium higher.

URANIUM PRODUCTION

GENERAL

Cameco Poised to Benefit from Increased Uranium Production in 2014

Cameco looks poised to benefit from an increase in production in 2014 and stands to benefit even more if uranium prices rise. Cameco is planning to ramp up production gradually from the 21.9 mil pounds it produced in 2012 to 36 mil pounds annually by 2018. Cameco's Cigar Lake project is expected to begin production in early 2014 and produce nine million pounds annually once it reaches full ramp up. Cameco is also undertaking a production increase at several of its other mines with an overall strategy of increasing production while at the same time exploring for and developing new resources. Cameco has been very successful at producing and purchasing uranium at low costs, which has kept it profitable even in current market conditions with the low spot price of uranium. In Q3 2013, Cameco produced 5.8 million pounds at an average all-in cost of \$28.31/pound. Cameco also purchased

Japan is expected to restart several of its 50 idle nuclear reactors in 2014, which should signal a big confidence boost for nuclear energy. While the process for restart approval is very tedious and slow-moving it seems almost certain that at least a few reactors will be back on 2014. We may also see a supply-demand imbalance in 2014 as global demand for uranium is expected to continue to grow and new uranium projects are delayed due to poor economics. The end of 2013 signalled the end of the twenty year US-Russia HEU Purchase agreement, a deal where Russia converted HEU from nuclear

In the longer term, there are over 60 nuclear reactors under construction globally with many expected to come online over the next several years. In the US, Southern Company is building two new nuclear units at its Vogtle nuclear power plant. These will be the first new nuclear power units in the US in over 30 years. With global uranium demand projected to increase steadily over the next several years, a longer term supply demand imbalance is likely to occur, which should lead to higher uranium prices over the longer term.

weapons to LEU and sold it to the U.S. This agreement accounted for up to 50% of nuclear generated electricity produced in the US and nearly 10% of the total electricity produced in the US.

With Cameco paying a dividend of roughly 1.9% based on the current stock price, it seems like it is worth being patient as near-term catalysts should lead to an increase in the uranium spot price. In the longer term, there are over 60 nuclear reactors under construction globally with many expected to come online over the next several years. In the US, **Southern Company** is

building two new nuclear units at its Vogtle nuclear power plant. These will be the first new nuclear power units in the US in over 30 years. With global uranium demand projected to increase steadily over the next several years, a longer term supply demand imbalance is likely to occur, which should lead to higher uranium prices over the longer term.

Another uranium company to consider is **Denison Mines**, which is a uranium exploration and development company with interests in exploration and development projects in Canada, Zambia, Namibia, and Mongolia. Denison Mines is an interesting story as it has switched from being a uranium producer to a uranium explorer and developer. In 2012, Denison Mines sold its US division in order to focus on exploring and developing a strong portfolio of strategic uranium deposits. Its most important project is the high-grade Wheeler project, and Denison's portfolio consists of 49 projects, including many joint ventures with uranium industry leaders. Denison also has a 22.5% ownership interest in the McClean Lake joint venture, which includes the McClean Lake uranium mill, one of the world's largest uranium processing facilities.

With a market cap of just under 600 million, Denison's stock could be a big mover with an increase in the spot price of uranium. However, Denison is a risky play as it will continue to eat up cash to fund its exploration program. Denison currently expects to have enough cash to allow it to fund exploration until the end of 2014, but after that it may be forced to tap the equity market, which would further dilute shareholders. While both Cameco and Denison Mines are compelling stories for 2014, Cameco looks like a more stable play. With its increased production over the next several years and solid contracting strategy, Cameco looks truly poised to outperform.

Source: Charles Sherwood, <http://m.fool.com/investing/general/2014/01/10/cameco-poised-to-benefit-from-increased-uranium-pr>, January 10 2014.

INDIA

Nuclear Fuel Complex Likely Soon at Rawatbhata

The deck is cleared for setting up the country's second nuclear fuel complex at Rawatbhata near Kota in Chittorgarh district. The environmental clearance from the ministry of environment and forests is in the final stages of approval and nuclear experts are very positive about getting the clearance soon. The proposed fuel complex will be set up at a cost of Rs 16,000 crore. The Hyderabad-based NFC has already started working for the Rawatbhata project and has issued notice inviting bids for the project which would require the statutory nod from the AERB.

The preliminary work for the project started after a team of environment experts visited the site in 2013.

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The site is located within the precincts of the RAPS and the heavy water plant, 65 km from Kota. Once the environmental clearance comes, the proposal would go for a formal Union cabinet approval. According to SK Sharma, project director of the RAAP, experts found the predisposed site along river Chambal ideal for the fuel complex. The deputy chief executive officer NFC, Goverdhan Rao said the fuel fabrication facility PFFF and ZFF,

is a project of the NFC. The NPCIL Ltd that produces nuclear power have expansion plan to add 10 units of 700 MW and PHWRs in the coming decade for which a constant stream of nuclear fuel would be required.

... Rao said the proposed facility will supply nuclear fuel bundles and reactor core components. It is a unique facility where natural and enriched uranium fuel, zirconium alloy cladding and reactor core components are manufactured under one roof. NFC symbolises the strong emphasis on self-reliance in the INPP. "As the number of nuclear plants in the country has increased in the past four decades, the need for setting up another NFC facility was felt. As Rawatbhata is a big hub for nuclear power generation it was felt that this could be an ideal location, added Rao. The Rawatbhata complex will have a 500 tonne per year fabrication facility and it will also have a 65 tonne per year zircalloy plant. In

Rawatbhata, six nuclear power plants are currently generating 1180mwe of power. Two of the new Indian-designed 700mwe series of reactor (RAPP-7 and RAPP-8) are under construction. The two reactors will cost an estimated Rs 123.2 billion and are likely to be completed by 2016-17 and after this the total production from RAPS will touch 1400mwe," said RAAP project director Sharma.

At present, NFC supplies fuel to the 19 operational power plants run by the NPC, which has 20 plants with an installed capacity of 4,800mw. A proposal is under consideration of the Union government to accord 'in principal' approval for the site at Mahi-Banswara recommended by the site selection committee for locating the indigenous 700 MW PHWRs at Banswara, a backward tribal region in southern Rajasthan.

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Source: Prakash Bandari, The Times of India, 13 January 2014.

KAZAKHSTAN

Kazakhstan Exports All Produced Uranium

All the uranium produced in Kazakhstan is being exported, in particular to China and Europe, the CEO of the Kazenergy Association Aset Magauov said at the 15th meeting of the Kazenergy Association Council on 16 January 2014, Trend Agency reported. Magauov went on to note that uncertainty is observed in the world uranium markets. ... "Despite the continuing decline of uranium price and closing of the fields in the world due to their unprofitability, low prime cost of production in Kazakhstan does not threaten work and production volumes in the country's fields," the CEO noted.

In the long term perspective the demand for uranium will grow as the implementation of most countries' plans on transition to low-carbon energy industry is possible only if the share of nuclear power plants in the generation structure is significant Kazakhstan has 0.85 million tons of uranium reserves and ranks second in the world in terms of reserves. Kazakhstan ranks first in the world in terms of uranium mining.

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possible only if the share of nuclear power plants in the generation structure is significant...." Kazakhstan has 0.85 million tons of uranium reserves and ranks second in the world in terms of reserves. Kazakhstan ranks first in the world in terms of uranium mining. As of 2012, uranium production in Kazakhstan amounted to 21,240 tons, or about 37 % of world production.

Source: Aynur Jafarova, AZERNEWS, 17 January 2014.

NIGER

Niger Uranium Mining Dispute a Test Case for Use of African Natural Resources

The wrangle between Niger and a state-owned French firm over payments for uranium extraction has wider ramifications. The protracted negotiations on uranium mining between Niger and Areva, the French energy multinational, are not just a trial of strength between an African government and a big company. The face-off will also test whether there is more than just pious sentiment to the notion that African countries should derive greater benefit from their natural resources. Areva, which owns stakes in the Somair and Cominak mines, has been negotiating with Niger over new uranium mining contracts for two years. The mines' 10-year licences expired on 31 Dec 2013 without a new agreement, although Niger issued a decree on 27 Dec 2013 providing a legal framework under the 2006 mining law for operations to continue. The company is tight-lipped on discussions. Olivier Wantz, a senior executive vice-president of Areva, was in the capital Niamey first week of January 2014 for three days of talks... .

The mines have been closed since mid-December 2013 for what Areva describes as routine maintenance. Some see the move as hardball tactics by the company to put pressure on the Nigerien government. At heart of the matter is the country's

desire for a better deal. Niger accounts for more than a third of Areva's uranium production, and President Mahamadou Issoufou's government wants to increase the royalties the company pays from 5.5% of revenues to 12%, officials told Reuters.

Areva, which is 87% owned by the French government, says an increase in the royalties rate would make operations unprofitable. The company has been mining uranium in Niger, a former French colony, for four decades. It owns about two-thirds of the open-cast Somair mine, which produced an estimated 3,000 tons of uranium ore 2013, and approximately one-third of the smaller, underground Cominak mine. France gets 75% of its electricity from nuclear energy but has never said to what extent it relies on Niger for uranium to fuel its 58 nuclear reactors. Niger and NGOs say one in three light bulbs in France is powered by Nigerien uranium. A French parliamentary committee report in 2008 put the figure at about one in five.

... Although mining made up 70.8% of Niger's exports in 2010, it contributed only 5.8% of the country's GDP. According to a report from Oxfam France and the Niger arm of Publish What You Pay, the transparency group, Areva's two mines produced uranium worth more than €3.5bn in 2010, but Niger received just €459m, or 13% of this amount. In 2012 Areva received tax exemptions worth €320m, the report says. Areva rejects Oxfam's figures and insists that since the creation of the mining companies, 40 years ago, 80% of revenues – €871m – have gone to Niger and 20% to Areva and its partners. It says Cominak and Somair have always worked within the framework of a mining agreement with Niger and observed mining laws. Areva made a loss of €99m 2013, but expects to make an operating profit of more than €1.1bn in 2014, helped in part by its uranium mining business.

The negotiations put the French government in a tough spot. As majority owner in Areva, it has

to look out for French commercial interests. On the other hand, Pascal Canfin, the energetic French development minister, is a champion of domestic resource mobilisation in poor countries – governments generating their own revenues – and a backer of EU initiatives on transparency in the extractives sector. NGOs are watching closely to see how different French interests play out. "As France has a strong stand on transparency and domestic resource mobilisation, it would make sense for it to put pressure on Areva.

Source: Mark Tran, The Guardian, 10 January 2014.

NUCLEAR COOPERATION

CHINA-NAMIBIA

The company has been mining uranium in Niger, a former French colony, for four decades. It owns about two-thirds of the open-cast Somair mine, which produced an estimated 3,000 tons of uranium ore 2013, and approximately one-third of the smaller, underground Cominak mine. France gets 75% of its electricity from nuclear energy but has never said to what extent it relies on Niger for uranium to fuel its 58 nuclear reactors. Niger and NGOs say one in three light bulbs in France is powered by Nigerien uranium.

CNNC – China's leading nuclear utility – has bought 25% of Paladin Energy's flagship uranium mine, Langer Heinrich, in Namibia. Through its wholly-owned subsidiary China Uranium Corp., CNNC paid \$190 mn for the stake. Under the agreement, the Asian company will be able to buy one-quarter of production at spot market prices.

China's Leading Nuclear Utility Buys 25% Stake in Paladin's Namibia Uranium Mine

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Langer Heinrich began producing uranium in 2007 and has undergone two stages of expansion. The operation has a current design capacity of 5.2Mlb of uranium concentrate per year and is targeting production on 5.7Mlb in 2014. Paladin will use the cash injection primarily to pay off debts. The Australian miner has been eager to find a partner for the Namibian project for some time now. In 2013 August the company lost 20% on

its share price after it announced that negotiations with potential buys had failed; the company didn't think the offered price would "appropriately" reflect the "strategic value of the asset." On 20 January 2014, the company gained nearly 10% on the Toronto Exchange, trading at \$0.60 per share. Over the past 12 months, Paladin has lost more than 50% of its value.

Source: <http://www.mining.com/chinas-leading-nuclear-utility-buys-25-stake-in-paladins-namibia-uranium-mine-77912/>, 21 January 2014.

EU-UKRAINE

EU, Ukraine Expand Nuclear Safety Cooperation

In 2014, the European Commission together with the SE NNECE will introduce the modern system of radiation monitoring RODOS (Real Time On-line Decision Support System), which operates in all EU countries, the Information-Analytical Bulletin of the Cabinet of Ministers of Ukraine reports. RODOS radiation monitoring system is by far the most effective and complete.

RODOS forecast mathematical models, which were developed by 40 European institutions for over 20 years, is unparalleled in the world. The system uses information of station radiological monitoring, operational meteorological forecasts and simulates scenarios of radiation contamination based on the data. RODOS is effectively used to predict the migration of radionuclides in the air, in agricultural

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products, as well as in natural ecosystems to calculate doses of internal and external exposure of workers and public in the area of the accident. Experts say RODOS includes mathematical models and databases to predict and assess the effects of possible radiation accidents, as well as emergency planning and long-term countermeasures using mathematical modeling based on neural computers. Experts assure that this is the

main advantage of the new system as neural computing allows to predict the development of the situation in the event of an accident, in particular, the direction of radiation contamination.

Source: <http://en.for-ua.com/news/2014/01/17/160931.html>, 20 January 2014.

IRAN-GULF STATES

Iran Proposes Nuclear Cooperation with Gulf States

Head of the AEOI Ali-Akbar Salehi proposed the formation of a nuclear cooperation organisation to alleviate concerns of Gulf littoral states, media reported on 15 Jan 2014.

Iran is ready to conduct expert and technical talks with the Gulf countries over the safety of Bushehr nuclear power plant, Salehi said, adding that the

Bushehr is among the most sophisticated power plants of its kind, and operates under the full supervision of the IAEA, Russian contractors and experts from Iran's Nuclear Safety Centre, Xinhua reported citing Press TV. He suggested a NGO be set up to resolve any doubts and concerns of the Gulf States about Iran's "civilian" atomic activities

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scientifically. "Should the NGO operate satisfactorily, it can be developed into a Persian Gulf nuclear cooperation organisation," he added. For further assuring the Gulf littoral states about the performance and safety of the plant, Iran is ready to allow nuclear experts from its southern neighbours to visit Bushehr power plant. ...

Source: ZEE NEWS, 19 January 2014.

PAKISTAN-CHINA

Pakistan to Acquire 3 More Nuclear Plants from China

Pakistan is in talks with China to acquire three large nuclear power plants for some \$13 billion. The deal is in addition to 2013 agreement to build two Chinese reactors in Pakistan's southern port of Karachi. The three Chinese reactors would likely be located in the centre of the country, in Punjab province, at a site now being prepared, officials said. Two advanced 1,100-MW reactors from China are already due to be built near the southern port of Karachi, under a \$9 billion agreement completed in 2013. The China-Pakistan nuclear trade bypasses international rules against nuclear exports to countries – like Pakistan – that have not signed the NPT.

... China says that its nuclear trade with Pakistan predates its membership of the NSG, and is therefore protected. India is also not a signatory to the NPT but the 2005 US-India civil nuclear deal led to India being given an exemption to import nuclear materials by the NSG. To China and Pakistan, the India-US nuclear deal was discriminatory and is perceived as an attempt to prop up India against China.

... Pakistan produces between 12,000 MW and 14,000 MW of electricity, while demand is at least 18,000 MW, according to the ministry of power, causing hours of power outages every day across the country. Demand is set to rise sharply with the ballooning population. Nuclear energy provides just 750 MW of power currently, through two Chinese-built 330 MW plants at Chashma, in Punjab province, and a tiny, aged, plant outside Karachi. China is currently building two more plants of the same size at Chashma, boosting nuclear output to 1,400 MW by 2016. The plan for the future is to acquire much larger 1,100 MW plants from China, including the two new reactors for Karachi.

China is the only country willing to supply Pakistan with nuclear plants, and Pakistan is China's sole market for nuclear exports, providing an outlet for China's hopes of selling its nuclear technology more widely. Ansar Parvez, chairman of the PAEC, which

builds and runs the country's nuclear power plants, said that the country's aim is to generate 8,800 MW of nuclear power by 2030. That target requires Pakistan to build six to seven large nuclear power plants, including the two already scheduled for Karachi. Each such plant costs \$4 billion to \$4.5 billion, said Mr. Parvez.

Source: Center for Environment Commerce & Energy, January 2014.

NUCLEAR PROLIFERATION

IRAN

Rouhani Says Iran Seeks Nuclear Technology for Peaceful Purpose

Iran is developing nuclear technology for peaceful purposes and does not seek nuclear weapons, Iranian President Hassan Rouhani was quoted as saying by Press TV on 15 Jan 2014. "The Islamic

republic has never been after nuclear weapons," Rouhani said in a meeting with religious scholars and seminary students in the southern Iranian province of Khuzestan on 14 January 2014. "All those countries that sought nuclear bombs did it secretly, and achieved it secretly," he said, adding that Iran's nuclear program has been under the eyes of the IAEA. If Iran intended to develop nuclear bombs, it would not be a signatory to the NPT and would not allow the IAEA to inspect its nuclear sites, he emphasized.

Rouhani said the Iranophobia campaign conducted by the West managed to present a false image of Iran, adding that his administration has been asserting to the world that "the Islamic Republic of Iran is after nuclear technology but not nuclear bombs. "This was the foundation for our negotiations with the P5+1 group, the West and the world's big powers," he was quoted as saying. ...

Source: Global Times, 15 January 2014.

Iran Starts Implementing Nuclear Deal, IAEA Report Shows

Iran has halted its most sensitive nuclear activity under a ground-breaking deal with world powers, a

Pakistan is in talks with China to acquire three large nuclear power plants for some \$13 billion. The deal is in addition to 2013 agreement to build two Chinese reactors in Pakistan's southern port of Karachi. The three Chinese reactors would likely be located in the centre of the country, in Punjab province, at a site now being prepared, officials said. Two advanced 1,100-MW reactors from China are already due to be built near the southern port of Karachi, under a \$9 billion agreement completed in 2013.

confidential UN atomic agency report obtained by Reuters showed, paving the way for the easing of some Western sanctions. The report by the IAEA also said Iran had begun diluting its stockpile of uranium enriched to the fissile concentration of 20 % – a level that took it closer to the capability of producing fuel for an atom bomb. The IAEA report to member states said: “The Agency confirms that, as of 20 January 2014, Iran ... has ceased enriching uranium above 5 % U-235 at the two cascades at the Pilot Fuel Enrichment Plant (PFEP) and four cascades at the Fordow Fuel Enrichment Plant (FFEP) previously used for this

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purpose.” It was referring to Iran’s two enrichment plants, at Natanz and Fordow. Cascades are interlinked networks of centrifuge machines that enrich uranium. Iranian state television earlier said Iran had suspended 20 % enrichment at Natanz and that inspectors were heading to Fordow.

The IAEA report also listed other measures Iran had agreed to under the interim accord with the six world powers – the US, France, Britain, Germany, China and Russia. Those included an undertaking that Iran would not build any more enrichment sites during the six-month agreement, a step meant to buy time for negotiations on a final settlement of Tehran’s decade-old nuclear dispute with the six powers. Enriched uranium can have both military and civilian purposes. Iran denies Western allegations that it has been seeking to develop the capability to make nuclear bombs, saying it wants only civilian atomic energy.

Source: The Globe and Mail, 20 January 2014.

NUCLEAR DISARMAMENT

NORTH KOREA

S. Korea, US Place Priority of DPRK Policy on Nuclear Dismantlement

South Korea and the US re-confirmed on 21 Jan 2014 that top priority of their policy toward the DPRK was placed at dismantling Pyongyang’s nuclear program. US Deputy Secretary of State William Burns, who arrived here on 20 January 2014 for a two-day visit,

held talks with Kim Kyou-hyun, South Korea’s First Vice Foreign Minister, to discuss issues such as cooperation between the two allies, the DPRK’s nuclear program and the Northeast Asian situation, according to the MoFA. The ministry said that the talks were in an extended line with the ministerial dialogue held on 7 Jan 2014 in Washington, noting that Burns and Kim had an in-depth discussion on the DPRK situation, which became volatile following the execution of Jang Song-Thaek, once-powerful uncle of DPRK leader Kim Jong Un. The two diplomats shared views over the DPRK situation,

promising to cooperate more deeply with each other on the DPRK policy.

Touching on the possible provocations from the DPRK, the two allies vowed to make concerted efforts to deter it, confirming that Seoul and Washington will strongly respond to any provocations. Burns and Kim said that Seoul and Washington will place the DPRK nuclear issue at their top priority, noting that efforts will be made to make an actual progress in the nuclear issue by closely consulting with countries involved, including China.

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They also shared views that the two allies should closely cooperate to build grounds for the reunification of the two Koreas and sustainable peace on the Korean Peninsula.

Burns told reporters after the meeting that he and Kim shared the importance of the verifiable denuclearization on the Korean Peninsula, saying that the two countries will continue their efforts to resume talks for the credible and authentic denuclearization of the peninsula. The six-party talks, the aid-for-denuclearization dialogue including the two Koreas, the US, China, Japan and Russia, have been suspended since late 2008. Seoul and Washington have called on Pyongyang to show its sincerity towards the denuclearization before resuming the multilateral dialogue. Later on 21 January, Burns will fly to China to continue his week-long East Asian tour, which also includes Japan.

Source: <http://english.cntv.cn/20140121/103588.shtml>, 21 January 2014.

NUCLEAR SAFETY

CANADA

Canada Ranked High for Nuclear Stockpile Security

Canada ranks near the very top in the world at safeguarding its weapons-grade nuclear material stockpile but is surrounded by a “disturbing lack” of unified global action to frustrate nuclear terrorism, warns a respected US group tracking data on weapons of mass destruction. Canada places second, behind only Australia, in the latest nuclear materials security index of 25 countries possessing at least one kg of weapons-usable nuclear materials, according to the Washington-based NTI. That’s up from a 10th-place tie with the UK and Germany in NTI’s inaugural 2012 index. The jump earns Canada special NTI recognition in 2104 for the most improved national performance, along with Belgium and Japan. Nuclear-armed Pakistan and India, rising nuclear player North Korea and suspected nuclear contender Iran all finished in the index’s basement. (151 other nations possessing less than one kg of weapons-grade material were ranked separately.)

“Global nuclear security is only as strong as the weakest link in the chain – and that makes it imperative that sovereign states exercise their own responsibility in the context of global co-operation,” said NTI, co-chaired by former US senator Sam Nunn and media mogul and philanthropist Ted Turner. The news comes at a touchy time in Canada. Government-owned AECL is in an escalating faceoff with a coalition of nuclear safety activists from Canada and the US. The groups demand the Crown corporation scrap its controversial non-proliferation plan to truck 23,000 litres of intensely radioactive liquid laden with an estimated 161 kg of HEU U-235 from its Chalk River nuclear laboratories northwest of Ottawa to a southern US facility. The intent is to down blend the material into fuel for civilian nuclear power reactors. The dozens of planned shipments still require several federal regulatory approvals on both sides

Western security experts believe elements associated with Islamic terror group al-Qaida have persistently sought the technical knowledge and components to build a simple gun-type nuclear weapon, requiring about 40 kg of HEU. Since it’s generally agreed that terrorists don’t have the capabilities to enrich uranium or breed plutonium, the materials are only available through theft, the black market, or transfer from a state sponsor.

of the border. A key US regulatory verdict is expected this spring or summer.

PM Stephen Harper committed Canada at the 2012 global nuclear security summit in Seoul to the return of additional HEU inventories to the US by 2018 to lessen the risk of nuclear terrorism. (Other unspecified quantities of US-origin HEU remain at Chalk River for the production of medical isotopes. AECL won’t discuss the inventory because of national security concerns.) Canada’s new NTI score is based on a decision to incorporate nuclear transport guidelines from the IAEA into Canada’s existing national regulations. The resulting NTI opinion appears to bolster AECL and US government assurances that the proposed shipments will not put the public or environment in undue jeopardy. (Canada also won NTI points for ratifying two key international nuclear security-related agreements.)

8 Jan 2014 release of the new edition of the index is intended to help set the stage for the 2014 global nuclear security summit in the Netherlands in March 2014. The report urges political leaders and their governments to build a global system for guarding the key fissile ingredients for a nuclear weapon – HEU or separated plutonium or the plutonium content in fresh mixed oxide fuel.

Western security experts believe elements associated with Islamic terror group al-Qaida have persistently sought the technical knowledge and components to build a simple gun-type nuclear weapon, requiring about 40 kg of HEU. Since it’s generally agreed that terrorists don’t have the capabilities to enrich uranium or breed plutonium, the materials are only available through theft, the black market, or transfer from a state sponsor. “Today, nearly 2,000 metric tons of weapons-usable nuclear materials are stored at hundreds of sites around the world; some of those materials are poorly secured and are vulnerable to theft or sale on the black market,” the advocacy group said in the report. “Couple those facts with the knowledge that terrorist organizations have plainly stated their desire to use nuclear weapons,

and the situation is very dangerous. "It doesn't take much material – enough highly enriched uranium to fill a five-pound bag of sugar or a quantity of plutonium the size of a grapefruit – to build a nuclear weapon.

"The result of a nuclear blast at the hands of terrorists or a rogue state would be catastrophic — with dire consequences that would stretch across the globe for economies, commerce, militaries, public health, the environment, civil liberties, and the stability of governments." Because Canada has no domestic enrichment facilities, fresh HEU from the US has long been shipped to Chalk River for production of medical isotopes. Finished isotopes are then shipped around the world and to the US, which has no domestic medical isotope manufacturers. Fears of potential theft of civilian HEU stocks and nuclear terrorism prompted the Obama administration in 2009 to launch a global effort to repatriate US-origin HEU and its by products. Under the program, the first unannounced shipment of HEU from Chalk River to the US took place in 2010. ...

Source: Ian Macleod, Ottawa Citizen, 08 January 2014.

GENERAL

Progress Made in Safeguarding Nuclear Materials

Seven countries have eliminated weapons-grade nuclear material from their territory in the past few years, according to a new report from the Washington-based non profit NTI. Though the elimination of such material represents significant progress in helping reduce the threat of nuclear terrorism, much remains to be done, according to NTI. This includes creating an effective and accountable global system to improve nuclear material security. The countries that removed material from their territory included Austria, the Czech Republic, Hungary, Mexico, Sweden, Ukraine and Vietnam, according to the 2014 NTI Nuclear Materials Security Index. That brings the number of nations with weapons usable material to 25, from 32 in 2012.

"In terms of national security – in terms of global security – this is great progress," said NTI Co-

Chairman Sam Nunn. "By deciding to get rid of their weapons-usable nuclear material, these seven countries have taken one of the most important steps toward ensuring that terrorists can't get access to the materials needed to build a nuclear bomb." The report, a follow-up to the first index released in 2012, assessed 25 countries with one kg or more of weapons-usable nuclear material in addition to 151 countries that have less than one kg or no materials but could be used as safe havens, staging grounds, or transit points for illicit materials.

Nearly 2,000 metric tons of weapons-usable nuclear materials – HEU or plutonium – are spread across hundreds of sites in the 25 countries, according to NTI, and some of that material is poorly secured. "All it takes to build a bomb is enough HEU to fill a five-pound bag of sugar or a quantity of plutonium the size of a grapefruit." As in 2012, Australia ranks

first among the 25 states with usable material. Australia also improved its score from 2012 by reducing quantities of materials and ratifying a key international legal agreement that commits states to criminalize acts of nuclear terrorism. The next four countries are Canada, Switzerland, Germany and Norway. Among states with nuclear arms, France, the UK, and

the US scored highest, with France tied for seventh place and the UK and the US tied for 11th. Among countries with less than one kg or no weapons-usable nuclear materials, the top five are Denmark, Finland and Sweden (tied for second), Spain, and Slovenia. Among countries with more than one kg of material, North Korea ranked last, right below Pakistan, India, and Iran.

Despite the removal of material, NTI says much more remains to be done to reduce the risk of nuclear terrorism. One recommendation is for nations to reach a consensus on principles for a global system. "While individual state actions are necessary, they are not sufficient, and leaders should work together to reach consensus on the key principles of an effective global system that covers all weapons-usable nuclear materials." The report also noted that about 85 % of global weapons-usable nuclear material is outside of civilian programs, in

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many cases because it is part of a military program. It is therefore not covered by guidelines from the IAEA or the major international legal agreement for securing nuclear materials, the PNM protection treaty, according to the report. NTI suggests that governments work to secure non-civilian material equally or better than civilian material.

NTI also recommends that countries build confidence in the effectiveness of security practices by taking steps such as participating in international peer reviews, publishing relevant regulations, and declaring inventories. It also recommends that more countries participate in treaties governing nuclear terrorism and physical security. ...

Source: http://www.gsnmagazine.com/node/39926?c=military_force_protection, 13 January 2014.

PAKISTAN

Study Highlights Improvements in Pakistani Nuclear Safety

Pakistan is the most improved nuclear weapon state when it comes to securing its nuclear assets, according to the 2014 NTI Nuclear Materials Security Index. Analysts credit this to Pakistan's efforts to safeguard nuclear facilities and material, as well as to increase transparency, though there is room for improvement. The report puts Pakistan in the top 10 of improved states out of a total of 25 surveyed, but the most improved of the nine nuclear weapon states. The report states Pakistan "demonstrated the largest improvement of any nuclear-armed state. Pakistan is taking steps to update its nuclear security regulations and to implement nuclear security best practices." ...

These consist of "human and personnel reliability programs, multilayered physical security of various nuclear facilities and assets, safety oversight and compliance through the autonomous [PNRA] nuclear material accounting and control procedures." In terms of physical security, Ahmed highlights the establishment of a specially trained 25,000 strong nuclear security force "to enhance physical security of fixed sites."

Pakistan's profile with the NTI states that efforts to improve the safety of Pakistan's nuclear assets added nine points in the "security and control measures" criteria. "Pakistan's improvement is primarily due to an increased score for on-site physical protection resulting from new laws and regulations requiring licensees to provide physical protection to nuclear sites and on-site reviews of security," the report states. The physical security of nuclear facilities was reviewed by the Army chief, Gen. Raheel Sharif, during a 10 Jan 2014 visit to the SPD. The SPD oversees all aspects of the civil and military applications of atomic energy in addition to the development, security, storage, deployment and employment of warheads, delivery systems and strategic forces, as well as Pakistan's space programs. ...

The report states Pakistan could improve by "strengthening its laws and regulations for physical security of material during transport to reflect the latest [IAEA] nuclear security guidelines, and for mitigating the insider threat" through personnel reporting "suspicious behaviour and requiring constant surveillance of areas of facilities where nuclear material is located." Analysts agree, however, that the danger from a physical attack on Pakistan's nuclear assets often quoted in Western media is exaggerated.

Source: *Usman Ansari, Defence*

News, 15 January 2014.

NUCLEAR WASTE MANAGEMENT

FRANCE

AREVA Enters Agreement for Nuclear Waste Services to US

AREVA TN signed a support services agreement with LLC WCS, which will provide access to storage and support services for the TN RAM Cask and associated equipment. With this agreement, AREVA TN will provide its US nuclear utility customers with greater flexibility for the safe disposal of low-level waste. WCS operates a state-of-the-art facility in Andrews, Texas, and will provide AREVA TN's customers with storage, processing and disposal of certain radioactive materials.

AREVA TN will begin using the WCS services in February 2014 for Vermont Yankee's fuel pool cleanup project. "This agreement with WCS is a vital component of AREVA TN's new RAM Cask PLUS program, which offers cost-effective, turnkey irradiated waste processing, disposal containers, packaging and transport services for our customers," said Mike McMahon, senior vice president of AREVA TN.... AREVA TN's RAM Cask PLUS is a new package of services that includes the handling and processing of non-fuel, irradiated waste for US

nuclear plants. The strategic partnership between AREVA TN and WCS combines the advanced capabilities of the TN RAM cask and state-of-the-art processing equipment to meet client needs. The processing equipment is designed to meet nuclear power plant seismic requirements and is ALARA compliant.

Source: <http://www.pennenergy.com/articles/pennenergy/2014/01/areva-enters-agreement-for-nuclear-waste-services-to-u-s.html>, 15 January 2014.



Centre for Air Power Studies

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

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