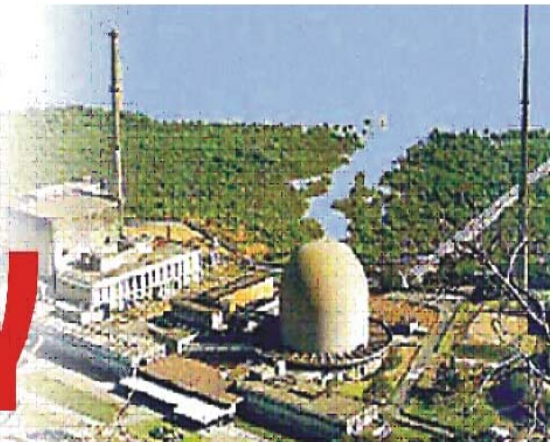
NUCLEAR SECURITY



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

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INTERVIEW – Shah Nawaz Ahmad, Senior Advisor, WNA

Nuclear Power Mitigates Economic & Carbon Impact

The protests against nuclear power notwithstanding, India continues to attract global attention in this regard, owing to the immense potential here. Shah Nawaz Ahmad, senior advisor, World Nuclear Association, in an interview with Sanjay Jog, explains how a decent mix would help India tackle the rising demand for power.

Q: How does WNA see India's move to increase nuclear capacity?

In India, the need for electricity is huge. The highest levels of the country's establishment are committed to nuclear power, and this has been proven over time. There may be some issues on civil nuclear liability laws, funding, production costs and localisation.

These are under various stages of negotiations. While it may be necessary for the public to know how these discussions are progressing, when there are technical and commercial discussions, you are likely to hear the good news only when the agreements are signed. A bit of patience would be of immense help. During the period between 2005 and 2013, we have, perhaps, not seen the sort of fruits expected. But we have to realise India has its own culture and mechanisms in the area of international cooperation. The fact that Australia has agreed to supply uranium to India is seen as a victory of diplomacy and negotiations. In the beginning, Australia had insisted on NPT, but later, it changed its stand. These things take time.

On the energy mix issue, I agree with former AEC chairman Anil Kakodkar's view that all resources – conventional, renewables and nuclear – have to be harnessed to meet India's electricity requirements. There is great consistency needed in conceptualising the country's energy needs.

Q: In India, those against nuclear power cite safety issues.

A bit of patience would be of immense help. During the period between 2005 and 2013, we have, perhaps, not seen the sort of fruits expected. But we have to realise India has its own culture and mechanisms in the area of international cooperation. The fact that Australia has agreed to supply uranium to India is seen as a victory of diplomacy and negotiations. In the beginning, Australia had insisted on NPT, but later, it changed its stand. These things take time.

Obviously, if any stakeholder has concerns, those have to be addressed. The nuclear community is very good at technical communication, but there is need for more associative communication in dealing with the concerns of the people. Perhaps, it needs augmentation and capable people who know local languages and have competencies on the technical side.

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There is a need to build trust over the long term by associating all stakeholders – right from the inception stage. Also, we have to tap experts from outside the government – credible experts from the academic community and from local leaders. The first step would be to educate stakeholders at their level of interest and understanding, in their language. This is an important job; communication with affected parties would yield positive results.

Q: Has nuclear power lost its vigour, especially after the Fukushima nuclear accident in 2011?

The nuclear landscape improved in 2012. For reactors across the world that were on a 'delay' mode after Fukushima, we have seen restarts. The world went into a mode of re-examining reactor safety, visualising what could happen in their systems.

Once satisfied after stress tests, they decided to go ahead. Many countries say

they plan to shut nuclear plants, even as the time comes to continue operating these. WNA estimates at least 73 GW of net new capacity would be added by 2020. Agneta Rising, director general of WNA says, "Countries representing more than 50 per cent of the world's population are committed to building nuclear power plants."

We have found extra care in the case of construction of plants and the quality of materials used leads to plant life, originally 40 years (according to design), safely being extended by 20-40 years. The economic impact of life extension means adding megawatts at a very low incremental cost.

We have to remember power demand is huge, particularly in developing countries. For instance, by 2034, the demand for power in China would grow by more than the current demand of Japan and the US together. A substantial part would be met through nuclear power. Of course, it is a big challenge, as major decisions have economic and political impacts. In Germany, the cost of electricity rose after the country revisited its policy on nuclear power; it is also finding it difficult to meet its carbon commitment.

The continuation of nuclear power would, at the least, mitigate the economic and carbon impact. This is applicable to India as well. We have found extra care in the case of construction of plants and the quality of materials used leads to plant life, originally 40 years (according to design), safely being extended by 20-40 years. The economic impact of life extension means adding megawatts at a very low incremental cost.

This has enabled the Tarapur nuclear power plant to supply cheap power. So, if it is safe, why not continue to operate? But there may be a need to convince the public by laying stress on transparency.

Q: Countries and reactor suppliers have raised concern on India's civil nuclear liability regime.

The concern expressed by countries and companies, genuine from their points of view, has to be addressed. As the law stands, operators of nuclear power plants are liable for any damage caused by them, regardless of a fault; the government is willing to step in with extra money, should the demand be beyond the operator's capability. Under certain conditions, recourse to suppliers is available to the operator and vendors want their liability to be more precisely stated.

Cost and liability are interlinked; hopefully, these issues would be resolved simultaneously. This, when achieved, would spur international cooperation in the civil nuclear area.

Some principal actors have publicly stated they are comfortable with the current laws.

Q: What is your take on the government's move to put in place an independent regulator for the nuclear sector?

We have to differentiate between perceived and executive independence. For safety, executive independence is extremely important. I think the AERB is independent enough. However, the government's move to set up an independent regulator is a step in the right direction. It would further empower the regulator and its perceived independence.

Source: Interviewed by Sanjay Jog, Business Standard, 27 July 2013.

OPINION – Happymon Jacob

New Delhi's Nuclear Dilemmas

New Delhi is currently in negotiations with various international export control organisations to gain their membership as the next logical step in the country's ongoing mainstreaming process into the international nuclear order. This 'mainstreaming process' was a result of the Indo-US nuclear negotiations which began in the wake India's nuclear tests in the summer of 1998. India will eventually gain membership of these organisations (namely the NSG, Australia Group, MTCR and the Wassenaar Arrangement). What is significant here is not only India's potential entry into these exclusive clubs, but doing so without giving up its nuclear weapons. None of these cartels admit into its membership those who have not signed the NPT of 1970 which derecognizes the nuclear weapon status of those who tested nuclear devises after January 1967.

India, in that sense, is trying to have the cake and eat it too when it is seeking, and seemingly succeeding, entry into these organisations without giving up its nuclear weapons. Much of this, of course, is a direct result of the country's strategic partnership with the United States, something that has been growing in strength in the past decade or so. I am not going to discuss the morality of this integration process here but rather about the broader implications of India's new nuclear identity for its foreign policy postures as well as the region's stability.

This 'mainstreaming process' was a result of the Indo-US nuclear negotiations which began in the wake India's nuclear tests in the summer of 1998. India will eventually gain membership of these organisations. What is significant here is not only India's potential entry into these exclusive clubs, but doing so without giving up its nuclear weapons.

Will the ongoing Indian efforts to mainstream itself into the global nuclear order have an impact on the country's broad foreign policy orientation? What does India's new nuclear status mean for strategic stability in the region?

Implications for Foreign Policy Orientation: India is clearly one of the major Asian strategic partners of the US and with the increasing rise of China on the global stage this partnership is only going to grow stronger. While there are benefits that a country can gain from being a strategic partner of the sole superpower, India would also have to do things that it may not necessarily like or may run counter to its foreign policy traditions. Indeed, the Americans have been pretty vocal, and sometimes subtle, about what they want from the Indian side. One such American demand has been the isolation of Iran. Consider the injunction in the Henry Hyde Act passed by the US Congress, the passage of which made the Indo-US nuclear deal possible: "Secure India's full and active participation in US efforts to dissuade, isolate, and, if necessary, sanction and contain Iran for its efforts to acquire weapons of mass destruction, including a nuclear weapons capability and the capability to enrich uranium or reprocess nuclear fuel, and the means to deliver weapons of mass destruction".

While these words are from a piece of US domestic legislation, one would have to assume the possibility of many more such indirect and unsaid demands from the American side to the Indian foreign and defense policy planners, and with time these demands are only going to increase. But why should India listen to the US since the Indo-US nuclear agreement is a done deal making it possible for India to engage in nuclear trade with rest of the international community? The problem is that the Indian integration into the contemporary international nuclear order is not yet a done deal. India, in a sense, is in a limbo and it might remain there for sometime requiring it to toe the American line without fail. American support is necessary for India to gain membership of the export control organisations mentioned above and more so given the fact that India is not a party to the NPT, the cornerstone of the contemporary nuclear order, will continue to be a major stumbling block at every step of New Delhi's path towards integration with the nuclear order.

The problem is that the Indian integration into the contemporary international nuclear order is not yet a done deal. India, in a sense, is in a limbo and it might remain there for sometime requiring it to toe the American line without fail. American support is necessary for India to gain membership of the export control organisations and more so given the fact that India is not a party to the NPT will continue to be a major stumbling block at every step of New Delhi's path towards integration with the nuclear order.

Why not become party to the NPT then? For India to become party of the treaty, it should either give up its nuclear weapons or the treaty has to change its most important provision which is the cutoff date for the possession of nuclear weapons – Jan 1, 1967. Now, changing this date is easier said than done especially with China, a major player in the global nuclear order, not too pleased with the ongoing Indian integration into the nuclear order. As a result, India's new nuclear identity will have clear implications for the broad contours of the country's foreign policy as well as its strategic autonomy.

Does it have an Impact on the Region's Stability?: Pakistan is livid at the special treatment given to India which it believes will, at the end of the day, enable India to add more warheads to its unclear arsenal. This in turn has made Pakistan strengthen its strategic partnership with China which is providing the former with a nuclear deal. To offset the assumed increase in the Indian nuclear material, Pakistan is feverishly increasing its own war heads. Pakistani frustration is not merely limited to India's new nuclear status. Pakistan is also unhappy that its neighbor is a sought-after strategic partner while the international community is increasingly isolating Islamabad.

Many in India argue that Pakistan deserves what it is going through today for the latter has done enough damage to India in the past and that the international community is doing the right thing by isolating Pakistan. While that may partly be true because it is clearly its past sins that are proving to be dangerous for Pakistan today, it makes absolutely no strategic sense for India to advocate the isolation of Pakistan. Indeed, I would argue that the international community should start engaging Pakistan in order to explore the eventual mainstreaming of Pakistan into the international nuclear order. If Pakistan is kept out of the global nuclear order, China will deal with Pakistan on its own with neither of them showing any responsibility or accountability to any of the rule-based global frameworks governing nuclear matters. Is it not better to have a Pakistan in our neighbourhood that is well integrated into the global nuclear order and hence is under the latter's strictures, oversight and inspections rather than a Pakistan that is in secret deals with a China that is hardly transparent or above board on nuclear issues?

Source: Dr Jacob teaches in the School of International Studies, JNU, New Delhi. http://www.greaterkashmir.com, 28 July 2013.

OPINION – The Yomiuri Shimbun

Pyongyang's Nuclear Ambitions Continue to be Impediment to Peace

The 60th anniversary of the signing of the armistice in the Korean War comes as North Korea continues to push ahead with its nuclear programs. The Korean War began with the North's invasion of the South in 1950, and claimed the lives of more than 3 million people before the armistice was signed three years later. Fierce fighting between US-led UN Command forces backing South Korea and China, which deployed Chinese People's Volunteer Army troops because it feared North Korea would collapse, ended with a divided Korean Peninsula in the absence of a peace treaty.

China's Change of Mind: The North and South are continuing their military confrontation across the Demilitarized Zone, and there is a danger the situation could explode into an armed conflict. North Korea, which falsely claims the armistice was a "victory," celebrated the 60th anniversary of the signing of the armistice with a massive military parade in Pyongyang. The scale of the parade was aimed apparently at flaunting the power of Pyongyang's young leader, Kim Jong Un, the first secretary of the Workers' Party of Korea, while diverting the people's increasing discontent over the country's wrecked economy.

Beijing's stance on seeking North Korea's denuclearization will now be put to the test. In regard to North Korea's call for a direct dialogue between Pyongyang and Washington, the US has made such a dialogue contingent on the North abandoning its nuclear ambitions. This condition is quite reasonable.

The biggest concern for Japan and other countries is the beefing up of North Korea's nuclear programs, which Kim has been promoting. Massive throngs of armed soldiers marched in the Pyongyang parade as if trying to impress the rest of the world with the strength of the North's ability to wage war with missiles and nuclear weapons.

As a matter of course, North Korea has been forced to pay the piper. The UN Security Council has imposed economic sanctions on Pyongyang for repeatedly carrying out nuclear tests and test-launching long-range ballistic missiles. China's recent change from its conventional stance of fully defending North Korea appears to have made the international coalition against the North more solid.

During the military parade, Chinese Vice President Li Yuanchao stood alongside Kim on the podium overlooking Pyongyang's main Kim Il Sung Square. Li reportedly told Kim that Beijing was determined to maintain its policy of pursuing the denuclearization of the Korean Peninsula, working to ensure peace and security on the peninsula and resolving tensions through dialogue and consultations.

This can be taken as a message to Pyongyang to return to the six-nation talks, as Beijing is resolved not to allow North Korea to possess nuclear weapons or engage in military provocations. China, as the largest donor country and trade partner of North Korea, has a life-or-death influence over the North. Beijing's stance on seeking North Korea's denuclearization will now be put to the test. In regard to North Korea's call for a direct dialogue between Pyongyang and Washington, the US has made such a dialogue contingent on the North abandoning its nuclear ambitions. This condition is quite reasonable.

North Must Heed Others: Pyongyang, for its part, must heed the voices of Japan, the United States and South Korea, which are calling on the North to abandon its nuclear ambitions. The environment surrounding the Korean Peninsula has changed dramatically since the signing of the armistice. For one thing, South Korea has established diplomatic relations with China, and the value of its trade with Beijing has expanded to such an extent that it has surpassed its combined trade with Japan and the United States.

North Korea has made the choice of becoming a nuclear power, with the result that it cannot normalize diplomatic relations with Japan or the United States. As it has been driven into a corner, Pyongyang has even declared it is ready to "pull out of the deal" concerning the armistice agreement. Japan, the United States, China and South Korea must remain vigilant to prevent North Korea from conducting new nuclear tests, missile launches or military provocations by firmly maintaining stringent sanctions to pressure Pyongyang to abandon its nuclear programs.

Source: The Yomiuri Shimbun, 28 July 2013.

OPINION – Debalina Ghoshal

Making Sense of India's Nuclear Weapons: Analysis

Use of weapons mass destruction is not new to India. The Vedic age had witnessed the development of weapons of mass destruction like the Pashupatastra and Brahmastra. In fact the Pashupatastra was so destructive a weapon that Lord Rama and Lakshamana were barred from using it. Post Vedic period, Kautlilya had stated that every nation desires to maximise its power and hence, moral principles are not of much concern to the states. He also stated that

agreements on peace issues could only be achieved amongst equal and superior kings while the inferior one could be attacked.

National security is of paramount precedence for any state. In realism and neo realism paradigm, state is the referent object and it has to be protected at any cost. Structural anarchy or the absence of a government gives rise to security dilemma. Existential threat is one of the important reasons why states generally develop nuclear weapons. South Africa developed nuclear weapons and used them as deterrence against both Soviets and the USA till the Cold War. Post 1991, South Africa with reduction of external threat had destroyed its nuclear weapons arsenal. Thus, as long as there is threat, states would try to secure themselves given that states exist in an anarchical world and there is a persistent existence of security dilemma. China's nuclear weapon development in 1970s made it mandatory for New Delhi to acquire the same. Thus, the domino theory was revealed in the region and Pakistan too followed the suit. Today Pakistan is developing sophisticated nuclear weapons and enhancing its arsenal leaving no other option for India but to join the arms race.

States which try to secure their national security "must balance against any rival state that develops nuclear weapons by gaining access to a nuclear deterrent itself". The "animus dominandi" or the desire for power of a state could be satisfied by enhancing its hard power prowess and nuclear weapons especially tipped with ballistic missiles are the best options. Kenneth Waltz had also stated in *Man States and War* that "power appear as a possible useful instrument rather than as a supreme value that men by their very natures are led to seek".

By adopting a 'no first strike policy', India made it clear to the world that nuclearisation is a compulsion for India given the threat it is subjected to from China and Pakistan. Hence, nuclear weapons would only be used in what is termed as 'punitive retaliation' in case she is attacked by nuclear weapons by her adversaries. The 'no first use' strengthens India's deterrence posture by being defensive, rooted in its cultural and traditional beliefs. Credible minimum nuclear deterrent was adopted as India felt that nuclear weapons are more of political weapons and not military ones and their only purpose is to provide deterrence against the use and the threat of use of nuclear weapons.

Since the development of nuclear weapons in both Pakistan and India, both the countries have avoided conflict even at a limited scale. Relations between China and India are also not as strained as it was before India's nuclearisation. India could choose this movement as an opportunity for convergence with Pakistan. Both India and Pakistan could stand up against 'nuclear apartheid' and the global zero and justify their cause of possessing nuclear weapons.

Nuclear weapons have been the "second force to working for peace in post war world" as had been put forward by Kenneth Waltz. K. Subrahmaniam had stated that if Mahatma Gandhi was alive, he too would have been in favour of nuclear weapons. Mahatma Gandhi had even said once "those nations who have atom bombs are feared even by their friends". One could rightly say that since the development of nuclear weapons in both Pakistan and India, both the countries have avoided conflict even at a limited scale. Relations between China and India are also not as strained as it was before India's nuclearisation.

India could choose this movement as an opportunity for convergence with Pakistan. Both India and Pakistan could stand up against 'nuclear apartheid' and the global zero and justify their cause of possessing nuclear weapons that if the developed countries could possess them, the developing countries could possess them too. States have the sovereign right to possess nuclear weapons. Nuclear weapons are resulting in an arms race in the region. Even though this is seen as a matter of concern, it must be understood that the arms race strengthens the stability-instability paradox in the region. However, in a few years, when arms escalation reaches its peak, both India and Pakistan could decide to call for talks on arms reduction.

Nuclearisation has also enabled India to look beyond Russia and build new defence relations with countries like Israel, the US and France. This has enabled India to acquire sophisticated weapons. India now talks of fifth generation aircrafts and missile defences. Large part of India's budget goes in building IRBM, SRBM, acquiring aircrafts like the Mirage category and the Jaguars. In a few years or so India would also be able to develop sea based deterrent which include submarine launched ballistic missiles and submarine launched cruise missiles. India is also working towards an Intercontinental Ballistic Missile of the Agni variant. There is an effort to develop MIRVs for the Agni class of missile. Long range ballistic missiles for developing countries become feasible only when they are fitted with nuclear weapons.

Conclusion: India's quest towards developing a credible survivable option would mean that India must keep its nuclear options ready. India's shift from liquid propelled fuel to solid propelled fuel is a step towards achieving

survivability since the latter is best suited for road and rail mobility. India needs to work effectively on its sea based deterrent for a counter and second strike capability since submarine launched ballistic missiles are the weapon for counter strike. However, no delivery system is credible without an effective command and control system. There should be a dispersal of command and control for effective control over the nuclear arsenal.

India must be able to articulate about the reasons for a ballistic missile defence and that the defence system is only for defensive purpose and not meant for any offensive purpose. That is, the defence system would be used to prevent an adversary's first strike, and not to launch a first strike and use the BMD to prevent the remaining adversary's arsenal for targeting India.

As India develops its MIRV capability, it must be noted that MIRVs require miniaturised warhead technology which could affect the range of ballistic missile, that is, it could reduce the range of ballistic missile. Being a first strike weapon, India must be able to articulate the fact that MIRVs are technology demonstrator for New Delhi and would not be used for first strike. However, given India's no first use policy, if the missiles survive a first strike, MIRVs would be the best option to launch a counter strike and destroy adversary's targets with minimum number of missiles....

Source: http://www.eurasiareview.com/, 13 July 2013.

OPINION – Richard Weitz

Roadblock to US Nuclear Arms Cuts

In a recent speech in Berlin, President Obama reaffirmed his commitment to nuclear disarmament and proposed steps toward achieving that goal. But Russia has made clear that it does not plan to pursue further reductions to its nuclear arsenal any time soon. In the speech delivered nearly 50 years after President John F. Kennedy addressed the then-divided city, highlighting the value of arms control between adversaries Obama announced that the US is prepared to cut its nuclear arsenal by up to one-third. He also proposed major reductions in the number of TNWs deployed in Europe. Moreover, he called upon the international community to renew its efforts to prevent Iran and North Korea from developing nuclear weapons; to bring the CTBT and the proposed FMCT into force; and to make nuclear energy safer.

Three years ago, Russia seemed to share Obama's aspiration to move beyond Cold War nuclear postures, with both countries agreeing to limit their deployed weapons to 1,550 as part of the New START. In fact, Russia considers New START to be a "gold standard" treaty, based on core principles modest and balanced reductions over an extended time period, adequate but not excessive verification measures, and recognition of the connection between strategic offense and defense that should be applied to all future arms-control treaties.

But Russian officials have since reaffirmed their hard-line position, stating in various settings including at the recent European Security Conference in Moscow that Russia will not consider further cuts to its nuclear arsenal until the US addresses certain issues affecting Russian interests. In fact, many of the Kremlin's demands may well be beyond the Obama administration's capacity to deliver.

Russian officials have since reaffirmed their hard-line position, stating in various settings including at the recent European Security Conference in Moscow that Russia will not consider further cuts to its nuclear arsenal until the US addresses certain issues affecting Russian interests. In fact, many of the Kremlin's demands may well be beyond the Obama administration's capacity to deliver.

One of Russia's main concerns is America's efforts to build up its ballistic missile defense system. Although experts have disputed the capacity of America's BMDS, Russian leaders remain convinced that it could seriously undermine Russia's nuclear deterrent.

Russian officials intimate that the US is using the threat of a North Korean or Iranian attack on the US with nuclear-armed ballistic missiles as a pretext to erect defenses against Russia (and probably China). Despite Obama's assurances (and those of his predecessors), Russia asserts that America's BMDS is actually intended to expand NATO's role in Europe, complicate Russian diplomacy, and facilitate US military interventions.

Russian President has even warned that, left unchallenged by Russia's nuclear deterrent, the US would be tempted to intervene militarily in more countries, as it did in the former Yugoslavia, Iraq and Libya. These concerns have driven Russia to demand that the US sign a binding treaty that limits the speed, location and capabilities of its missile defenses and includes mandatory transparency provisions even as Russian officials acknowledge that the US Senate would never ratify such a treaty.

Another issue constraining nuclear disarmament is Russia's view that, without nuclear weapons, its military capabilities would be no match for the conventional forces of the US and NATO. Indeed, many in Russia worry that a US attack against Russia's nuclear deterrent and other defense assets that relies on America's growing stock of

long-range, precision-guided conventional weapons would be as devastating as a nuclear strike.

These fears are exacerbated by Obama's declared intention to work alongside NATO in seeking to reduce by as many as 5,000 Russia's arsenal of TNWs which dwarfs NATO's holdings of roughly 200 and to have the remaining warheads relocated away from NATO members' territory. Many in Russia view their country's dominance in this area as essential to offsetting imbalances in conventional weaponry.

In fact, no formal arms-control treaty directly covers these nonstrategic weapons; nor have they been the subject of targeted NATO-Russia negotiations. And as long as the US has TNWs deployed near Russia's border, Russian officials insist they will not initiate such talks.

Even if the US managed to get Russia to the negotiating table, convincing it to accept sizable cuts in its TNWs arsenal could require the US to fulfill additional demands, such as limiting NATO's military concentrations and facilities near Russia's periphery and resurrecting the Treaty on Conventional Armed Forces in Europe on the Kremlin's terms.

Moreover, Russian leaders demand that other nuclear-armed states accept comparable limits on their TNWs stocks. Indeed, Russia wants to replace the predominately bilateral nuclear arms-control processes of the last 50 years with multilateral negotiations aimed at constraining the offensive capabilities of other nuclear states, including the UK, France and China and maybe other countries. But convincing these states to participate in arms reduction negotiations, much less to accept new constraints on their relatively small nuclear arsenals, would be difficult.

Russia's leaders do not share Obama's aversion to nuclear weapons. On the contrary, they believe that, while the likelihood of a nuclear war has fallen sharply since the end of the Cold War, nuclear deterrence has become more valuable for Russia and other countries that are outmatched by America's conventional military power. This might prove to be an insurmountable obstacle to realizing the Obama administration's vision of a nuclear-weapons-free world.

Like the Obama administration, they believe that the next round of cuts should focus on Russia and the US, which still possess almost all the world's nuclear weapons. The fundamental challenge is that Russia's leaders do not share Obama's aversion to nuclear weapons. On the contrary, they believe that, while the likelihood of a nuclear war has fallen sharply since the end of the Cold War, nuclear deterrence has become more valuable for Russia and other countries that are outmatched by America's conventional military power. This might prove to be an insurmountable obstacle to realizing the Obama administration's vision of a nuclear-weapons-free world.

Source: Richard Weitz is senior fellow and director of the Center for Political-Military Analysis at the Hudson Institute. The Japan Times, 21 July 2013.

OPINION – International Business Times

Can Africa Go Nuclear? Energy Demands Battle With Safety Concerns Across the Continent

Nuclear power generation is ramping up in South Africa, which recently signed a deal with the European Commission to cooperate on research, nuclear materials and equipment supplies. The deal will help bring power to South Africa's remote rural regions – an initiative the rest of sub-Saharan Africa is eager to emulate.

South Africa is the only sub-Saharan African country with active nuclear power plants. But research-oriented nuclear reactors have been tested in a few other countries – including Kenya, Ghana and the Democratic Republic of the Congo – and it is clear that there is widespread interest in a nuclear-powered future all across the continent. Uganda, Nigeria, Senegal, Niger and others have expressed interest in building up nuclear expertise within their borders.

But Africa's nuclear ambitions are dampened by ongoing difficulties. The DR Congo's nuclear reactor – Africa's first – sits idle within a crumbling compound in Kinshasa, the capital, since shutting down due to overheating in 2004. In Ghana, some officials would like to have a nuclear power plant up and running in eight years, but controversies abound as to whether the project is economically feasible – or safe. In Kenya, the government is adamant about installing a nuclear power plant and has already identified some potential construction sites; a facility could be operational within five years if all goes according to plan, and $3 million has already been allocated to an energy planning committee. But the resistance has been vocal, and the committee is moving slowly in the face of domestic and international hesitance.

South Africa has one research reactor and two nuclear power plants already online for a total capacity of 1,500

megawatts, but it's not all smooth sailing. There are internal disputes as to the viability of nuclear energy expansion, with National Planning Commission in favor of importing more clean energy from abroad while the Department of Energy holds fast to its plan for ever-growing nuclear energy production capacity.

Despite these complications, it is easy to see why so many African countries are pursuing nuclear power. Energy is in high demand; according to the World Bank, only about 24 percent of the population of sub-Saharan Africa currently has access to electricity. But generating power is a tricky proposition no matter how it's done; coal needs reliable rail infrastructure to ensure delivery, while hydrocarbons – whether produced domestically or imported – can be expensive or politically complicated. Nuclear power requires a lot of capital during the early stages, but it can be relatively affordable once it gets going....

A few organizations are working with African governments and communities to nip these concerns in the bud, including the IAEA, and the members of the African Regional Cooperative Agreement for Research, Development and Training Related to Nuclear Science and Technology, known as AFRA. But nuclear power is a complicated and dangerous business, and the challenges loom large....

Source: http://www.ibtimes.com/, 24 July 2013.

New Delhi has done 10 underwater launches of SLBMs code named 'B05' using a submerged pontoon to mimic a submarine. It can travel 700 km, while the bigger variant, so far know as the 'K-4', can hit targets 3,500 km away and will finally be installed on Arihant and also the next two follow-on submarines of the same class.

NUCLEAR STRATEGY

INDIA

N-powered Sub Arihant All Set to Sail Out from Vizag

Indigenously built nuclear-powered submarine, INS Arihant, is finally set to sail out from its base at Vishakhapatnam. The 6,000-tonne submarine, armed with nuclear missiles, is ready after years of efforts interspersed with sanctions in 1998 and impediments due to non-availability of cutting-edge technology. "The nuclear reactor that will power the submarine can be formally declared 'critical' anytime now, while the nuclear-tipped missiles to be launched from underwater are in place," sources said.

"Everything is ready," a functionary said. "The wait is for the monsoon to subside before Arihant (slayer of enemies) dives into sea. A certain amount of calm is needed at sea when the vessel goes out the first time. The monsoon on the East Coast starts weakening by the middle of August, meaning the submarine will slither out in a couple of weeks from now," he added. "Around 95 per cent of harbour trials are over," sources said. Once the submarine is out at sea, it will run on nuclear-powered 80MW PWR. The PWR was developed by the BARC with assistance from a Russian designing team. It uses enriched uranium as fuel and light water as coolant and moderator.

Once at sea, the vessel will be gradually loaded with weapons and missiles. All parameters will be tested after each addition. "Each test will be conducted underwater for two months or more. This will include the SLBM", sources said. New Delhi has done 10 underwater launches of SLBMs code named 'B05' using a submerged pontoon to mimic a submarine. It can travel 700 km, while the bigger variant, so far know as the 'K-4', can hit targets 3,500 km away and will finally be installed on Arihant and also the next two follow-on submarines of the same class.

The submarine will provide second-strike capability in case of a nuclear attack. It is the easiest to launch a nuclear strike from a submarine as it remains submerged, hence the enemy cannot detect it. ... Being nuclear-powered, the submarine will not have to surface for two months to breath, like the conventional vessels have to. India will join the US, the UK, France, and China by having such technology and prowess.

Arihant has cost Rs 15,000 crore. It has been jointly developed by the Navy, BARC and the DRDO at the Visakhapatnam naval dockyard. Russian designers assisted in building the vessel. Other companies involved in the development of the submarine are Tata Power and L&T. The project, earlier known as the ATV, has been under development since 1998.

Source: Excerpted from article by Ajay Banerjee. http://www.tribuneindia.com, 28 July 2013.

USA

US House Votes to Limit Obama's Ability to Shrink Nuclear Arsenal

The US House has approved a plan that would limit President Obama's ability to shrink America's nuclear arms arsenal without congressional approval, with its sponsor claiming the White House intends to ignore the Constitution.

The lower chamber approved an amendment to an energy and water bill that would cut off funds for any atomic weapons reductions the White House might pursue without first seeking Senate approval. The amendment was offered by House Armed Services Committee member Rep. Mike Turner, R-Ohio, a hawkish Republican who claims the President plans to ignore the Constitution.

"On 19 June 2013, President Obama declared before an audience in Berlin that he was announcing significant changes to the nuclear force posture of the US," "One of the most significant ambiguities to emerge from that announcement was whether the President would follow the bipartisan tradition that nuclear arms reduction agreements take place according to the Constitutional structures the framers intended," Turner wrote in the letter, which was obtained by *Defense News*.

... A White House official fired back ... "Such provisions would "purport to restrict the President's constitutional authority to negotiate international agreements, including sole executive agreements for arms reduction," according to the administration's policy statement. The provisions also would "impinge the president's authority to determine the number of strategic delivery vehicles needed to meet national security requirements," the White House said.

What's more, the White House document claims the House language would "limit the President's authority to determine appropriate force structure to meet nuclear deterrence requirements and to set nuclear employment policy – authority exercised by every president in the nuclear age." ...The amendment passed by voice vote, meaning there is no public record of how individual members voted nor the final margin. Whether the provision will be included in the final version of the energy and water bill will ultimately be up to a House-Senate conference committee.

Source: http://www.defensenews.com/, 12 July 2013.

BALLISTIC MISSILE DEFENCE

RUSSIA–IRAN

Putin to Offer Advanced Antimissiles to Soothe Iran's S-300 Grudge – Report

Russian President Putin may visit Tehran in August 2013 ... among other things he is to discuss with Iran's new President is a possible deal to supply advanced antiballistic missiles to the Islamic Republic.

Putin is expected to fly to Iran on 12 August 2013 to meet in person the country's newly-elected President Rouhani.... The trip would probably be the first visit of a foreign head of state to the country after Rouhani is sworn in .... The two leaders are likely to discuss a number of pressing political and economic issues from Iran's controversial nuclear program to Russia's participation in the expansion of Iran's Bushehr nuclear power plant, the report says. Among them is a possible arms deal, which is certain to draw objections from some countries.

Russia is offering Iran to purchase S-300VM Antey-2500 air defense systems, according to defense industry sources. It's a cousin of the S-300 long-range surface-to-air missile family. S-300s were developed for the Soviet air defense forces, but the ground forces, an organizationally distinct branch of the army, wanted a similar system tailored for their own needs. On their order the S-300V was developed and later upgraded to the better S-300VM version.

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Kommersant first reported that S-300VMs may be offered to Iran in June 2013, citing anonymous sources. The move is meant to convince Tehran to revoke its complaint against Russia over the canceled deal to deliver five batteries of S-300 antimissiles, which was signed in 2007 but scrapped in 2010 when then-Russian President Dmitry Medvedev signed a law limiting Russia's military cooperation with Iran....

Russia is not planning to revoke the 2010 decree which put an end to the deal and came following a UNSC resolution issuing sanctions against Iran over its nuclear program. But the S-300VM systems are not listed among the weapons banned from sales to Iran and a not subject to the decree. Over the years Moscow explored several approaches to mend the rift with Tehran that the broken deal caused. Among those was an offer to supply Tor-M1E air defense systems, which Iran rejected, according to Iranian and Russian sources.

Military experts believe that the Antey-2500 deal would be more attractive to Tehran. The system was tailored to intercept tactical ballistic missiles. A possible Israeli attack on Iran is expected to start with a massive missile attack on Iran's key air defense sites and military air bases before follow-up airstrikes at its fortified nuclear enrichment facilities. S-300VMs are well-suited to counter this threat, Kommersant said.

Earlier, top Iranian officials, including outgoing President Ahmadinejad, confirmed that negotiations to settle the conflict over the scrapped S-300 deal out of court are underway.

An S-300VM battery is capable of taking down both aerial targets moving as fast as 4,500kph, tracking and engaging up to 24 aircraft or up to 16 ballistic missiles simultaneously. It has a range of up to 200km for aircraft and up to 40km for ballistic missiles. It takes no more than 6 minutes for a trained crew to deploy the system from travel position to combat position. The system is cleared for international export. Russia sold two S-300VM batteries to Venezuela in April 2013, which was the first deal for the hardware. Turkey and India are among possible buyers of the system....

Source: http://rt.com/news/, 24 July 2013.

NUCLEAR ENERGY

AUSTRALIA

Scientists Push for Nuclear Power in Australia

A group of scientists and engineers has called on Australian political leaders to consider the introduction of nuclear power as an effective way of combating climate change. The call has come from the Australian Academy of Technological Sciences and Engineering. The Academy's concerns have been backed by a number of scientists and engineers from countries across Europe. As Darren Mara reports, many of them argue that fears over potential mishaps from nuclear power have been vastly overstated. The President of the Australian Academy of Technological Sciences and Engineering, Professor Allan Finkel, says he believes there has been a lot of unnecessary scaremongering around nuclear energy. He says this has particularly been the case since the accident at the Fukushima reactor in Japan in 2011.

Dr Finkel says there were no deaths from nuclear radiation after the earthquake and tsunami and he believes the risk of radiation-linked cancers was near zero. He believes nuclear technology is safe and could prove to be more effective than solar and wind power in reducing carbon emissions. "In Australia, nuclear power would need to be eminently safe with minimal low grade waste and strict management of raw material at every stage. We would need a vigorous regulatory system and we would need to adopt internationally proven standard reactor designs. Perhaps we could even use small modular reactors of 300 megawats or less which are the sort that have been used in ships and submarines for nearly 60 years with an excellent safety record."

That is a view shared by another scientist-Professor Ken Baldwin, who is the Director of the Energy Change Institute at the Australian National University in Canberra. He believes Australia is at risk of falling behind other countries in the fight against climate change because its political leaders are not prepared to consider nuclear power. "And if we cut ourselves off from a particular avenue to reducing this carbon dioxide in the world's atmosphere, then we are essentially fighting the carbon challenge with one arm tied behind our backs (only partially). So that's really the reason why we need to advance on all fronts simultaneously as hard as we can in order to fill that carbon gap and keep the carbon dioxide levels down to a reasonable level."

... Dr Cameron says he believes there would be clear long term economic and environmental benefits if Australia started building nuclear power plants. "I think the debate around nuclear energy needs to happen and it needs to happen in Australia because of its really heavy reliance on fossil fuels which makes it difficult for Australia to say to other countries in the world, you need to control your emissions when it's not taking leadership itself. "So I think the low carbon argument is very strong. The argument of security of supply is very important and that's where nuclear can help as well and the argument of affordability because Australian electricity prices are increasing rapidly and nuclear would provide a long-term stable electricity price."

Another nuclear scientist from France, Dr Massimo Salvatores says the industry in his home country is closely monitored by independent safety authorities. However he concedes that nuclear agencies have often struggled to explain their work to the general public. "If you have the local people with you I think everything becomes much easier and much more under control. This has been, by the way, the experience in France, where the local population who have been the most informed and who get the most benefits from the installation of power plants in their area-they are the ones who are the most favourable and most in support of nuclear (power)."

Brisbane-based climate scientist, Emeritus Professor Ian Lowe says he believes political leaders need to confront public fears before there can be a sensible debate around nuclear energy in Australia. He says he can relate to some of these fears, especially if plans were put forward for nuclear reactors in earthquake-prone areas. "The concern people have I think is that when catastrophic events happen, the consequences if radio nuclear material is involved are much more serious than if it's coal or gas or

solar or wind. The nuclear waste problem is in principle solveable given enough political commitment and technical effort. But so far it hasn't been solved 50 years into the nuclear power experiment."

The concern over the disposal of nuclear waste is shared by environmental activist Natalie Wasley from the lobby group Beyond Nuclear Initiative. She believes past experience has shown that the nuclear industry does not consult as effectively as it should with local communities over where to dump its waste material. "In the last eight years, there has been a sustained community campaign in the Northern Territory to stop the federal government forcing its plans for a low to intermediate radioactive waste dump there. The government never asked Traditional Owners and local community members or at the time the Northern Territory Government about that proposal. "That's the sort of top-down secretive approach we see from governments all around the world in regards to nuclear facilities. It is very important that we do manage radioactive waste safely. As of yet, there is no high level radioactive waste facility operating anywhere in the world."

Source: Excerpted from article by Darren Marra and Michael Kenny, http://www.sbs.com.au, 28 July 2013.

INDIA

India's Prototype Fast Breeder Reactor at Advanced Stage of Completion

India's first commercial fast breeder reactor the 500 MWe Prototype Fast Breeder Reactor (PFBR) is in an advanced stage of completion at Kalpakkam, Tamil Nadu, chairman, Atomic Energy Commission, R.K. Sinha said. "All the major equipment of the PFBR have been erected and the loading of the dummy fuels in peripheral locations is in progress," he told the IAEA International Ministerial Conference on Nuclear Power in the 21st Century ...When contacted, Prabhat Kumar, chairman and managing director, BHAVINI said 95 per cent of the PFBR construction had been completed. "We are now heading towards the final erection, integration and commissioning of the reactor. The reactor will go critical by September 2014," he said.

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The Nuclear Fuel Complex, Hyderabad, is manufacturing the reactor's fuel bundles and they are being assembled in a workshop at the Indira Gandhi Centre for Atomic Research at Kalpakkam. The Centre had sanctioned Rs. 5,677 crore for building the PFBR and "we will definitely build the reactor within that amount" Mr. Kumar asserted. The original cost of the project was Rs. 3,492 crore and it was revised to Rs. 5,677 crore. Electricity generated from the PFBR would be sold to the State Electricity Boards at Rs. 4.44 a unit. BHAVINI builds the breeder reactors in India.

Source: The Hindu, 01 July 2013.

1,000mw K-Power in 20 Days by Kudankulam Nuclear Reactor

The Kudankulam nuclear reactor is performing as scheduled and the first plant which attained criticality will generate 1,000 MW after 20 days, Union minister of state in PM's Office V. Narayanaswamy said. "The first reactor will generate 400 MW power in the next 20 days and 1,000 MW in another week,"...the second unit of Kudankulam Nuclear Power Plant would also start generating power in the next six months. ...The project was necessary in view of the power shortage in the country, especially Tamil Nadu, which was experiencing acute power crisis. "Coimbatore and Tirupur are suffering more than 16 hours of power cut, which is crippling industrial development there," he stated and urged PMANE to give up its opposition to KKNPP in Tirunelveli district.

Source: http://www.deccanchronicle.com/, 21 July 2013.

JAPAN

Voters in Japan's Election Affirm Nuclear Revival

The recent elections for the Diet's upper house gave the LDP 115 seats out of 242. Its coalition partner and another pro-nuclear party won 29 seats. This consolidated the LDP position and role in reviving the economy, including restoring power supplies by restarting idled nuclear power plants as soon as possible. The DPJ with its policy of abandoning nuclear power by 2040 won only 59 seats. The LDP won a seat in every constituency with a nuclear power plant. In Fukushima prefecture the LDP candidate polled more than twice as many votes as the DPJ candidate. In Fukui prefecture, where Kansai has 11 units, Japan

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Atomic Power Co. has two units, and the government has the Monju prototype breeder reactor, the LDP candidate beat the DPJ contender, 237,000 votes to 56,000.

Source: World Nuclear News, 22 July 2013.

USA

Industry Urges US Government to Expedite Nuclear Trade

As a major agreement to be renewed with South Korea remains bogged down, the National Association of Manufacturers, and the US Chamber of Commerce and the NEI are urging the US Administration to adopt a more determined and pragmatic approach to increasing international trade in nuclear goods and technologies. "We strongly encourage the administration to promote such engagement aggressively by, among other things, rapidly concluding cooperative agreements with countries that have decided to pursue nuclear energy and promptly renewing expiring agreements with existing US trading partners." In today's highly competitive and global market "Unyielding and inflexible insistence on [unilateral enrichment and reprocessing restrictions] ... threatens the ability of the US to engage in nuclear cooperation with countries embarking on civil nuclear programs, thereby jeopardizing the safety, security, nonproliferation and economic benefits of such cooperation."

In today's highly competitive and global market "Unyielding and inflexible insistence on [unilateral enrichment and reprocessing restrictions] ... threatens the ability of the US to engage in nuclear cooperation with countries embarking on civil nuclear programs, thereby jeopardizing the safety, security, nonproliferation and economic benefits of such cooperation."

"Nuclear suppliers from such countries as France, Japan, Russia and Korea offer inter- national customers a competitive range of products and services, and a growing number of nations are considering developing civil nuclear energy programs in partnership with these countries rather than the US," the organisations said. In contrast to 1954 when the current legislation was drawn up, the USA is "no longer ... the dominant supplier to a global market that will grow to nearly $750 billion over the next decade."

Several countries such as Vietnam and Saudi Arabia are seeking other suppliers, while renewal of seven bilateral agreements with the USA are pending. "Given the nuclear energy industry's requirements for long-lead items and use of long-term contracts for nuclear fuel and services, timely renewal of these agreements is critical to maintaining the credibility of the US as a reliable supplier and partner."

Source: World Nuclear News, 23 July 2013.

Market may Claim Older Nuclear Power Plants Ahead of Obama Climate Rules

Nuclear reactors that light New York City and Chicago with carbon-free electricity face possible extinction before they can reap the benefits of President Barack Obama's proposed climate rules. Entergy Corp.'s Indian Point power plant in New York and Exelon Corp.'s Clinton facility in Illinois are among nuclear generators that may be shut down from either political or financial pressure on an industry that generates as much as $50 billion in US electricity sales each year.

Obama's stricter emission plan that would penalize dirty operators and make cleaner generation like nuclear more competitive probably won't kick in until after the end of this decade. That leaves operators of reactors at least six years to survive the lower prices and higher costs of the current market. ... A slump in power prices, increasing maintenance expense as plants age and stricter safety regulations following Japan's 2011 Fukushima nuclear disaster may prompt the industry to retire as many as five plants before the end of the decade, according to research firm UBS Securities LLC. That would eliminate enough generating capacity to power 2.4 million US homes.

Reactors are combating critics that want to shut them down over safety concerns. New York, for example, has solicited bids to replace Indian Point with natural gas-fired generators and authorized a transmission line to deliver hydropower from Quebec. Retired nuclear units would likely be replaced by gas plants built by operators such as NRG Energy Inc., which would have the result of increasing overall greenhouse gas emissions. That may complicate Obama's longstanding goal of slashing US emissions 17 percent from 2005 levels by 2020, and echo challenges faced by countries such as Japan and Germany as they phase out nuclear power, said Chris Gadomski, an

In the US, four reactors already have been permanently closed this year, the highest-ever annual total, according to US Nuclear Regulatory Commission data. A glut of shale gas, government-subsidized wind power and slack demand has slashed power prices more than 40 percent since 2008, making it harder to justify costly-repairs or continued operation of aging nuclear units.

analyst for Bloomberg New Energy Finance.

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Exelon and Entergy have projected about $900 million in additional costs for their reactors from new Fukushima-related safety rules over the next six years, according to regulatory filings. The two companies said they have no plans to close any nuclear units. Costs to run a reactor could climb by 5 percent annually through 2015, according to a Feb. 19 research report from Credit Suisse Group AG. New carbon regulation for existing plants probably won't take effect until about 2020, according to Julien Dumoulin-Smith, a New York-based analyst for UBS Securities. Smaller and older single-unit facilities that sell power in competitive markets are the most vulnerable because they feel a proportionately larger impact from rising maintenance and other expenses, said Patterson.

Source: http://www.delawareonline.com, 27 July 2013.

Nuclear Power: Dying or Reborn?

Perhaps the oddest thing about nuclear power's journey through American history is that we can't seem to decide whether nukes are dying, being reborn or walking around as zombies.

... Nuclear plants have had a bad-news few years. In June, Southern California Edison announced that it would permanently shut its trouble-plagued reactors at San Onofre, which powered 1.4 million homes in the region. This spring, Dominion Resources closed a nuclear plant south of Green Bay, Wis. (The plant was in good working order, but falling energy prices made the Kewaunee facility not worth the trouble.) On the other hand, nukes remain central to America's electric grid, pumping out about 19% of our national juice, and die-hard supporters see nuclear power as a carbon-free cure for climate change.

The industry's origins date to the 1950s, when "too-cheap-to-meter" nuclear energy was touted as a sidekick to the H-bomb and a mascot for the Cold War. Thanks to quiet, steady growth in the 1960s and early '70s, approximately 35 plants were in operation by 1977, and construction had begun on 30 more. By then, however, a growing environmental movement also was targeting nukes with mass demonstrations at sites like Seabrook, N.H., and star-studded benefits like the 1979 "No Nukes" concerts.

Around this time, Wall Street noticed that nuclear plants were not the financial performers they were cracked up to be. After the near-disaster at Pennsylvania's Three Mile Island, financial interests in new nukes went into cold shutdown. Chernobyl's disaster seven years later put an exclamation point on the nuclear retreat.

But things began to rumble in the first years of the 21st century. Fear and loathing of Middle East oil, volatile fuel prices, and growing concern over climate impact of fossil fuels gave the industry an opening for a comeback.

Five years ago, the NRC saw a spree of new nuclear reactor license applications, and in early 2012 it gave approval for the first new plant in 30 years. Southern Company broke ground on two reactors at its existing Plant Vogtle, near Augusta, Ga. Echoing an old theme, Southern CEO Thomas Fanning said the plants would provide "cheap, reliable power" for years to come.

President Barack Obama has been criticized for "picking winners and losers" for federal subsidies of solar power, but there is no similar uproar over the $8 billion loan guarantee for a new nuclear plant that already is running into trouble. The pitch of greenhouse-gas-free energy still seems to be powerful.

That all sounds good, in theory. But a couple of footnotes about the "cheap, reliable" part: Southern is looking to have its customers cover what are known as "construction work in progress" costs. In other words, while the industry is willing to profit from its investments in new facilities, if there are losses, they will be picked up by ratepayers. The Vogtle project is believed to be somewhere between $700 million and $1 billion over budget already, and 18 months behind schedule.

Has that discouraged government backers? Far from it. The Obama administration offered Southern $8.3 billion in loan guarantees for the plant, an offer still awaiting final negotiation and acceptance. If you're keeping score, that's about 16 times what the White House lent to the ill-fated, crony-infested Solyndra solar venture.

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Both of Obama's energy secretaries, the departed Nobel Laureate Stephen Chu and his successor, nuclear physicist

Ernest Moniz, are industry supporters. Even some environmental icons, like Stewart Brand, James Lovelock and NASA-scientist-turned-climate-activist James Hansen, are willing to back nuclear power as a result. And the industry isn't shy about trumpeting the clean-air angle. Still, all that waste has to go somewhere. For a long time, that was supposed to be Yucca Mountain in southern Nevada, but that is increasingly unlikely to become a reality.

As of 2013, only four new reactors have broken any sort of ground. But never count out nukes. Instead of three strikes and you're out, nukes are still batting on strike 17. So is nuclear power born, dying or zombie? Hard to say. But whatever the answer is, it's probably scary.

Source: Excerpted from article by Peter Dykstra. http://www.fresnobee.com, 29 July 2013.

URANIUM PRODUCTION

AUSTRALIA

Australia Minister Calls for More Uranium Development

Australia's resources and energy minister has called on the country's uranium sector to increase development to meet growing global demand. "We need industry to commit to further development of new projects to ensure that our uranium production meets global demand, particularly as demand for uranium is likely to surpass current supply," Resources Minister Gary Gray said in a speech to the Australian Uranium and Rare Earths Conference in Fremantle. Gray's remarks followed China's decision to cancel a proposed $6 billion nuclear fuel processing project in Southeast China following protests against the facility....

While uranium production in Australia last year increased more than 17 percent, reaching 8,000 tons, that amount is less than the output from 2003 to 2009 when it was 9,000 to 11,000 tons....Australia has nearly 40 percent of the world's recoverable uranium resources, but supplies only 19 percent of the world market.

Australia already supplies about 22 percent of China's uranium and is "well placed" to reap the benefits of supplying uranium to China and India, which together are expected to bring 35 reactors on line within the next two decades.... While uranium production in Australia last year increased more than 17 percent, reaching 8,000 tons, that amount is less than the output from 2003 to 2009 when it was 9,000 to 11,000 tons...Australia has nearly 40 percent of the world's recoverable uranium resources, but supplies only 19 percent of the world market.

John Borshoff, managing director of uranium miner Paladin Energy in Perth...said "absurdly low uranium prices" had halted the development of new supplies needed to meet nuclear power capacity being developed around the world...."The uranium industry is definitely in crisis and is showing all the signs of a mid-term paralysis if this situation doesn't demonstrably change.... Borshoff said the uranium industry's customers were much to blame for the current situation because their focus has been on the short-term expediency of current cheap prices rather than the dramatic gap forecast to open between supply and demand in coming years.

Source: http://www.upi.com/, 22 July 2013.

CHINA

China Digs Deep for Uranium to Meet its Rising Energy Demands

China, one of largest importers of uranium, has drilled to a depth of nearly 3,000 metres to secure a steady supply of the yellow cake for its nuclear reactors to meet its growing energy demands.

China National Nuclear Corp. (CNNC) announced that a "technological breakthrough" of drilling to 2,818.88 metres was achieved in the resource-rich Fuzhou City in east China's Jiangxi Province, with its drilling reaching a new depth with a cutting section twice as big as an ordinary optical disk. China's uranium prospecting has typically been carried out at depths less than 500 metres. Its previous record drilling depth reached 1,200 metres. CNNC said the new drilling technology can help boost China's domestic uranium supplies and ensure the key energy source for developing nuclear power generation. In addition to the drilling depth, the company said it has independently developed parts of drilling equipments and technology to facilitate uranium exploration, state-run Xinhua news agency reported.

...A government white paper on energy released in October 2012 said China had 15 nuclear power-generating units in operation with a total installed capacity of 12.54 GW. China has another 30 units currently under construction, which will add another 32.81 GW. China now produces about 1,000 tons of uranium a year. According to the WNA, China will consume 20,000 tons of uranium a year by 2020, which is about a third of the global output in 2009. China imported 16,126 tons of uranium in 2011, six per cent lower than the 17,135 tons it imported in 2010. It buys 95 per cent of its uranium from Kazakhstan, Namibia, Australia and Uzbekistan. ...

Source: http://www.business-standard.com/, 17 July 2013.

NUCLEAR COOPERATION

CHINA–PAKISTAN

Commitment New Pakistan Reactors

Pakistan's top-level Executive Committee of the National Economic Council has approved funds to purchase two new nuclear power reactors from China. The 1100 MWe ACP1000 units were together priced at PKR959 billion ($9.6 billion). They will be supplied by China National Nuclear Corp and built at the coastal Karachi site near Paradise Point in Sindh province about 25 kilometres west of the capital. At present Pakistan has a 40-year old 125 MWe pressurized heavy water reactor at Karachi and another nuclear power plant at Chashma in northern Punjab province. This has two 300 MWe Chinese-built reactors operating with two more under construction.

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Source: http://www.world-nuclear-news.org, 11 July 2013.

EU–SOUTH AFRICA

EU-South Africa Extend Nuclear Cooperation

A new nuclear cooperation agreement struck between South Africa and the EU will support joint nuclear research and could help open access to South Africa's uranium resources. Signed at the Sixth South Africa-EU Summit staged in Pretoria on 18 July 2013, the agreement aims to promote "cooperation in the peaceful use of nuclear energy." The European Commission noted that the agreement "results from the mutual interest to establish a stable legal framework for cooperation in the nuclear field and will help in fostering the scientific cooperation between the EU and South Africa."

The agreement's text notes that the two parties will cooperate in "the supply of nuclear and non-nuclear materials, equipment and related technologies associated with civil nuclear power." They will also promote the "peaceful uses of nuclear energy, including commercial exchanges, taking into account that South Africa has large uranium reserves." While South Africa has significant uranium resources, production has generally been a by-product of gold or copper mining. In 2012, the country produced just 465 tonnes of uranium.

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R&D Activities: The accord calls for the EU and South Africa to cooperate in researching and developing nuclear energy, including fusion technologies; the use of nuclear materials and technologies, notably in health and agriculture; nuclear safety, radioactive waste and used fuel management, decommissioning, radiation protection including emergency preparedness and response; and developing nuclear safeguards. This will include the exchange of experts, scientific and technological information, as well as establishing joint scientific working groups. EU and South African research groups will work together on nuclear research projects, drawing on EU funds from programs such as the European Union's Horizon 2020 program that is now being agreed by EU ministers and the European Parliament.

A Commission memorandum said: "As a concrete example, South Africa has developed the Pebble Bed Modular Reactor (PBMR), which could become a viable alternative to other reactor types. European R&D organizations are already involved in this program. South Africa is also active in medical applications of nuclear energy and is a major producer of medical radioisotopes." A joint statement said that the EU and South Africa would also work together in implementing the African NWFZ Treaty, also known as the Treaty of Pelindaba....

Source: World Nuclear News, 24 July 2013.

USA–INDIA

Biden, PM Discuss Civil Nuclear Deal

In what is his first visit to India as Vice President Joe Biden discussed ways to take forward the commercial aspects of the civil nuclear agreement between the US and India with PM Singh. As US Secretary of State John Kerry said in June, the two countries are looking to finalize a commercial agreement between NPCIL and Westinghouse for a nuclear reactor in Gujarat is looked upon by many also as an attempt to impart fresh momentum to ties. Biden also called on President Mukherjee, who thanked him for his support as a Democrat in the Senate to the civil nuclear agreement. Reciprocating the sentiment, Biden said no other

two countries had so much in common or at stake in the emerging global scenario.

Source: http://articles.timesofindia.indiatimes.com/, 24 July 2013.

US Senators Lament Lack of Progress on Nuclear Deal

Two influential US senators have lamented that even after eight years of the announcement of the landmark civil nuclear agreement, which lifted the US moratorium on nuclear trade with India, New Delhi is yet to provide a workable nuclear liability agreement that will companies to move forward.

In a letter to Secretary of State John Kerry, the co-chairs of the Senate India Caucus, Mark Warner and John Cornyn, said the agreement was arrived to provide US assistance to India's civilian nuclear energy programme and expand bilateral cooperation in energy. "Yet, eight years later, the agreement has not been implemented, and we have yet to see India provide a workable nuclear liability agreement that allows nuclear companies to move forward. We need to finish what we started and realise full commercial potential of this important agreement," the letter states.

Source: Excerpted from article by Sujay Mehdudia. The Hindu, 29 July 2013.

NUCLEAR PROLIFERATION

NORTH KOREA

North Korea has Everything in Place for New Atom Test: US Expert

North Korea has strong technical reasons to carry out another nuclear test but may be hesitating because it would anger China...Stanford University's Siegfried Hecker, who was shown a previously undetected uranium enrichment facility when he was last there three years ago, said the North had "everything in place" for what would be the fourth such explosion since 2006.

...Hecker said North Korea "needed additional tests in my opinion to miniaturize", referring to the effort to develop a bomb small and robust enough to fit onto a delivery vehicle such as a missile. The outside world tries to monitor North Korea's nuclear advances largely via satellite images.... North's tunnel preparations had caused speculation that there could be two tests back in February 2013, but this did not happen and one tunnel remained ready. "There are strong drivers for them to test again," said Hecker, believed to have been the last Westerner to visit North Korea's Yongbyon nuclear complex. "They have a tunnel that's ready to go if they want to test again," he told a seminar held by an international nuclear-test-ban treaty organization in Vienna. But China's displeasure was an important reason "why I think they are hesitating now... The price they have to pay is mostly determined by China", Hecker said.

China is North Korea's most important economic and political backer, but the two are uneasy allies and tensions have grown. Some Chinese banks have frozen out North Korea's main foreign exchange bank amid frustration in Beijing over the North's continued pushing of its nuclear weapons and ballistic missile programs.... Hecker said he believed the North was weighing the benefits and costs of further testing: "The important part is to increase the cost ... and the Chinese are absolutely key to that". North Korea said this July 2013 it would not give up its nuclear deterrent until Washington ends its "hostile policy" towards Pyongyang, but it was ready to revive international talks on its nuclear program frozen since 2008....

North Korea "needed additional tests in my opinion to miniaturize", referring to the effort to develop a bomb small and robust enough to fit onto a delivery vehicle such as a missile. There are strong drivers for them to test again. They have a tunnel that's ready to go if they want to test again. But China's displeasure was an important reason "why they are hesitating now.

Source: The Reuters, 17 July 2013.

Panama Interdicts N. Korean Ship Carrying Suspected Missile Parts

The Panamanian government announced on 15 July 2013 that it had interdicted a North Korean cargo vessel for transporting what looked to be ballistic missile components after setting sail from nearby Cuba, the Associated Press reported. Panamanian President Martinelli in an interview with RPC radio said the North Korean-flagged ship had been sailing for the East Asian country. The vessel was ferrying undocumented arms that looked to include unconventional weapons and missiles in a breach of UNSC rules that bar Pyongyang from all weapons commerce. ...Panama is a member of the US-led multinational Proliferation Security Initiative, whose members agree to work together to block the illegal transport of mass destruction by sea, air or land.

Source: http://www.nationaljournal.com/, 16 July 2013.

IRAN

Netanyahu: Iran 'Weeks Away' From Crossing Red Line

PM Netanyahu launched a rhetorical offensive against Iran. The move came amid unease that the world might be

enticed by a "compromise proposal" that Jerusalem believes Tehran is hatching, and concern that regional turmoil was distracting everyone's attention from Iran's nuclear march.

Senior Israeli officials said the Iranians were considering a proposal whereby they would agree to a temporary halt of uranium enrichment to 20 percent, and even agree to convert some of that enriched material to a lower grade, in return for a partial lifting of sanctions. "This is an insignificant and meaningless concession," one senior official said.

Regarding the 20% enriched uranium, the Islamic Republic was just 60 kilograms short of crossing his "red line." He defined this line – beyond which the Iranians should not be allowed to proceed – as being the possession of 250 kg. of 20% enriched uranium, enough fissile material for a nuclear bomb. He said they now had 190 kg., up from about 110 six to eight months ago.

"The Iranians have invested a lot in upgrading centrifuges and have the technological ability to replenish their stockpiles within a few weeks. We will totally oppose this sort of proposal because it does not offer a real solution." Netanyahu, meanwhile, told an American audience on CBS News's Face the Nation that regarding the 20% enriched uranium, the Islamic Republic was just 60 kilograms short of crossing his "red line." He defined this line – beyond which the Iranians should not be allowed to proceed – as being the possession of 250 kg. of 20% enriched uranium, enough fissile material for a nuclear bomb. He said they now had 190 kg., up from about 110 six to eight months ago.

Netanyahu said the Iranians were also building "faster centrifuges that would enable them to jump the line at a much faster rate. That is, within a few weeks."... Netanyahu's tough rhetoric is widely seen as an attempt to reinsert a sense of urgency regarding Iran, urgency that some in Jerusalem feel has been lost due to the election in June of Hassan Rouhani as Iran's new President, and also because of the tumultuous events roiling the region.

...Regarding Rouhani, Netanyahu said the Iranian President-elect had criticized his predecessor, Mahmoud Ahmadinejad, "for being a wolf in wolf's clothing. His strategy is, be a wolf in sheep's clothing. Smile and build a bomb."According to Netanyahu, Iran was expanding and improving its uranium enrichment capabilities, and in parallel was developing a plutonium reactor so it would have two tracks to create material for a nuclear weapon. At the same time, he said, Tehran was expanding its ballistic missile capabilities. ...Israel's demands are harsher than those of the international community, which – through the P5+1 – has indicated that Iran must cease enriching uranium to 20% but could keep for civilian purposes some of its stockpiles of uranium that had been enriched to a lesser degree.

Source: http://www.jpost.com/, 14 July 2013.

NUCLEAR SAFETY

ISREAL

IAEA Rules Israel's SOREQ Nuclear Reactor Safe in First-Ever International Inspection

The IAEA held a comprehensive safety inspection of the Soreq Nuclear Research Institute two weeks ago and found the facility to be safe. This was the first time international nuclear safety experts had thoroughly examined the Soreq facility, covering its operational procedures, processing of waste, and safety and employee training.

The delegation, headed by James Lions of Integrated Nuclear Safety Assessment of Research Reactors, also included his Egyptian deputy and five independent experts from Argentina, France, Germany, Australia and Hungary. It spent a week studying the facility....

The Soreq facility is under IAEA supervision and is visited twice a year by IAEA supervisors, who ensure that the facility is being used for research rather than military purposes. But these visits do not include comprehensive examination of operational procedures, such as the institute's organizational structure or its emergency procedures. The Israel Atomic Energy Commission is planning its own comprehensive safety examination at the Negev Nuclear Research Center in Dimona. A representative of the Dimona center was therefore present at all stages of the Soreq inspection, despite the fact that Dimona – which, according to foreign reports, produces nuclear weapons – is not under IAEA supervision.

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...Active since 1960, the Soreq institute is expected to be shut down at the end of the decade and replaced by a particle accelerator, which is already under construction. Both Israeli nuclear facilities, in Soreq and Dimona, are

relatively old, and scientists have called in for them to be shut down in the past. But Nir Hesneshfrong, director of research at Soreq, explained that age does not affect the reactor's performance, since the reactor is operated only one or two days a week.

...The Dimona facility's safety procedures have been severely criticized by the courts in recent years, following a suit by 44 employees and the families of former employees who claimed they had developed cancer and other diseases due to overexposure to radiation. IAEC officials insisted that the number of cancer cases among employees isn't higher than that among the general population. Nevertheless, a year and a half later, Justice Minister Tzipi Livni appointed a committee to recommend special compensation for employees who developed fatal diseases.

Source: http://www.haaretz.com, 23 July 2013.

JAPAN

Japan Revising Fuel Cycle Safety Rules

Draft safety requirements for nuclear fuel cycle facilities and research reactors have been approved by Japan's NRA. Meanwhile, restart inspections are to proceed at four power reactors. While revised safety regulations covering the restart of nuclear power reactors idled as a result of the 2011 Fukushima accident came into force on 08 July 2013, the NRA's commissioners have now approved the draft criteria for new safety regulations for the country's fuel cycle facilities and research reactors.

The new safety standards will be applied to the country's fuel fabrication plants – including the MOX fuel facility currently under construction at Rokkasho – and its reprocessing facilities. Used fuel and radioactive waste storage and disposal facilities will also be subject to the revised rules, as will research reactors (including the Monju prototype fast breeder reactor) and nuclear fuel research centres.

The requirements will vary from facility to facility, but generally include reinforcement measures against natural threats such as earthquakes and tsunamis, and in some cases tornadoes, volcanoes and forest fires. Severe accident countermeasures will also be required at the country's fuel fabrication and reprocessing facilities. These include measures against terrorist attacks, hydrogen explosions, criticality accidents, fires resulting from solvent leaks and vaporization of liquid waste....

Since the new safety requirements for power reactors were launched, four Japanese utilities – Kansai, Hokkaido, Shikoku and Kyushu – have applied for permission to restart twelve of the country's non-operating reactors.

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The NRA has now announced that it will begin safety inspections at four of these units: Hokkaido's Tomari unit 3, Shikoku's Ikata unit 3, and units 1 and 2 of Kyushu's Sendai plant. The regulator requested that Hokkaido submit additional information before checks will be carried out at units 1 and 2 at Tomari.... The NRA has also requested Kansai conduct additional seismic studies and tsunami risk calculations at its Takahama 3 and 4 units before it will start inspections of those reactors. No decision was announced on when safety inspections would be carried out at Kyushu's Genkai 3 and 4.

Source: World Nuclear News, 24 July 2013.

NUCLEAR WASTE MANAGEMENT

USA

US Shale Formations Might Safely House Nuclear Waste

Shale and other clay-rich rock formations might offer permanent disposal solutions for spent nuclear fuel, according to a new paper by the US Geological Survey. There is currently about 70,000 metric tons of this spent fuel in temporary storage across the US. While no specific sites have been evaluated for storage potential in the US, USGS scientists have looked at several research efforts, including projects that are underway in France, Belgium and Switzerland to confirm that shale formations in those countries are favorable for hosting nuclear waste repositories....

Shale formations are attractive for nuclear waste storage for several reasons. First and foremost, they have extremely low permeability, meaning groundwater cannot easily flow through them. Most shale formations and similar rocks containing abundant clay are millions to tens of billions of times less permeable than aquifers that are used to supply water.

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The primary concern with radioactive waste underground is to prevent any groundwater that contacts it from carrying contaminants out of the repository. Formations with very low permeability significantly reduce the potential for that contamination to occur. It is also important to ensure that water-transmitting fractures are absent over large areas, and in many shales it appears possible to do this. ...Potentially usable shale formations in the US those without extractable energy resources or other prohibitive circumstances – are distributed widely across the country and many are in tectonically stable areas. Geologically and geographically, potential choices for a repository are many....

Source: http://www.usgs.gov/, 23 July 2013.

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 Cmde Jasjit Singh, AVSM, VrC, VM (Retd).

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