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## REVIEW – V.R. RAGHAVAN

### India, Pakistan and Nuclear Weapons

The global nuclear weapons scene has changed meaningfully over the last decade. After a new government has taken charge in New Delhi, its response to Pakistan has also shown a new facet in calling off the talks. This book's (*India's Sentinel*) perspectives on nuclear weapons and Pakistan provide a timely addition to the discourse. Air Commodore Jasjit Singh was a prolific and persuasive strategic author for over thirty years. His writings became nuanced as his strategic thinking evolved over the decades. He wrote on a wide a range of issues related to India's security, which included national security organisations, China, the role of Air Force in modern wars, defence budgets, joint warfare and air space management.

The book brings together Jasjit Singh's select writings on two subjects which have remained dominant themes in India's security discourse. These articles and book chapters had been published over 20 years. Indian strategic thinking has evolved over the decades with new weapons, doctrines and tactics and Jasjit Singh's writings offer an insightful kaleidoscope of these seminal changes.

**Nuclear Disarmament:** Jasjit Singh was a passionate advocate of global nuclear

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disarmament even as he wrote voluminously on India's nuclear doctrine and command and control et al. He argued that India's innate size and capabilities gave it an advantage which can be

better utilised in a world without nuclear weapons. As a pragmatic realist he also argued for India to have the best in nuclear weapons related capabilities, until complete and verifiable universal nuclear disarmament takes place.

In 1999, he explained India's decision to go nuclear by saying, "the combined effect of various policies of the weapons states and their allies has been to put an

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increasing amount of pressure on India's ability to maintain an open option and push policy toward the non-nuclear end without any movement toward the weapon states giving up their own weapons." He recommended, even before the Nuclear Doctrine was announced that India should maintain the moratorium on testing and provide a No First Use Pledge.

On nuclear command and control, Jasjit struck out on a path different from others. While others preferred a Chief of Defence Staff and a Tri-Service command structure, he chose to push for nuclear command being placed with the Indian Air Force. This was on grounds of not separating the Air Force assets into a nuclear weapons delivery

portion. In this the redoubtable Jasjit was taking a line taken later by the Indian Air Force in opposing the CDS proposal, which had been recommended by the K. Subrahmanyam Committee in its Kargil War Report. This line was later developed into the call for an Aero-Space Command led by the Air Force. Neither of these fully fructified into a coherent policy over the years.

**Limits on War:** On nuclear deterrence Jasjit was a pioneer in highlighting the limits nuclear weapons placed on fighting wars. He was emphatic that the, "sheer existence of nuclear weapons with both adversaries imposes major limitations on the way force and violence can be used against each other without risking a nuclear exchange. This alters the very nature of war." This axiom was proved soon in the Kargil when Pakistan used its army to occupy the heights on and across the LOC. This had led to an Indian response which was executed bearing in mind Jasjit's warning on the nuclear weapons. This had in turn led to a wide ranging debate on fighting a 'limited

war' under a nuclear overhang. While the debate is yet inconclusive, it nevertheless proves the merit of the argument that nuclear weapons have indeed changed the way war will be fought by two nuclear adversaries.

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Over the years, international terrorism has changed the nature of nuclear threats, and non-state actors instead of states have become the major source of anxiety on nuclear weapons threats. Nuclear Security Summits led by the USA have had a positive impact and India has actively participated in the action plans generated by them.

Recent books on Pakistan have all highlighted the one unchanging reality of Pakistan. It is of its army's total control

over policies concerning national security and inter alia on India. One author has commented that Pakistan is 'stable in its instabilities' and that nothing, not even the resolution of the Kashmir issue, will change its army's implacable enmity with India. In India, the analysis has moved on to its economic and industrial strengths which have linked it closely to the global financial and trading system.

Economist Jack Hirshleifer had referred to it as a standoff between India's technology of production versus Pakistan's technology of conflict. Indian economic growth linked to global systems is vulnerable to uncertainties in the investment climate, which can be created by the cheaper forms of conflict through terrorism.

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which, as Jasjit Singh's writings show, military force is not the answer. The belief that Pakistan can be weaned from this strategy by concessions, through appeasement and by talks about talks is seen by

**Pakistan army believes terror is an instrument of state policy for which, as Jasjit Singh's writings show, military force is not the answer. The belief that Pakistan can be weaned from this strategy by concessions, through appeasement and by talks about talks is seen by many as a misplaced notion.**

many as a misplaced notion. Pakistan has changed rapidly in the last decade and is currently in a state of political and economic uncertainty. The book's chapters confirm that with or without nuclear weapons, there are no verities available for strategising a response to Pakistan.

*Source: The Hindu, 08 September 2014.*

**OPINION – Raja Menon**

**Boxed in by Pakistan**

Five years after the nuclear tests, India published its doctrine, which spoke of “no first use”, minimum credible deterrence and implied a massive retaliatory strike if attacked with nuclear weapons. Although Pakistan's doctrine is still unwritten, there is no ambiguity in New Delhi that Pakistan intends its nuclear arsenal to deter India's conventional forces by nuclear first use.

Since 1998, there have been three Indo-Pak crises in what might be called a nuclear environment. They are the Kargil conflict, the post-Parliament attack mobilisation and the attack on Mumbai in 2008. It was, however, Operation Parakram after the Parliament attack scenario that led to much theorising on the salience of nuclear weapons. The inability to mobilise the Indian army's strike corps quickly enough led to talk of a “cold start” as a possible course of punitive action. Although cause and effect can only be speculated upon, Pakistan in 2012 deployed short-range nuclear-tipped missiles that could be used as battlefield nuclear weapons.

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**Between 2002, when Operation Parakram was executed, and 2012, an argument has been conducted in a shadowboxing kind of manner between India and Pakistan. The Indians have held that Pakistan's ongoing strategy of abetting terrorism in India will lead to reprisal using India's conventional superiority, and Pakistan's nuclear weapons will not deter it.**

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Delhi and the three Indian armed forces did nothing, however, to implement any change in strategy or hardware to execute this punitive reprisal, apart from what had already been designed for a regular state-to-state conflict. Words such as “war below the nuclear threshold”, “space for conventional war below the nuclear threshold” and “full spectrum deterrence to close the threshold gap” were used.

Normally countries that rely on nuclear deterrence resort to what is called “nuclear signalling” to convey nuclear intentions to the other side. Signalling should, over time, create stability, thereby avoiding nuclear crises. In South Asia, Pakistan has resorted to more and not always measured nuclear signalling, while India has been over-reticent in conveying nuclear intentions. The result is that there is deep nuclear instability in the Indo-Pak relationship, which unfortunately resembles no other bilateral nuclear relationship of the Cold War. There are no precedents to go by, particularly in the use of terrorists by Pakistan as an instrument of state policy, along with nuclear weapons.

The result is that there is a tactical imperative on India to resort to a conventional punitive strike which, in a stable nuclear environment, would be hazardous. A couple of army chiefs who declared that India has the ability to wage a conventional war below



the nuclear threshold were silenced by an obstructive defence minister, signalling Indian confusion to the Pakistanis. Pakistan's TNWs have been seen by India as a signal that the window for a conventional strike has been closed, thereby boxing India in between terror continued....

Source: <http://indianexpress.com>, 06 September 2014.

**OPINION – Steve Kidd**

**UK Energy Policy – Where Did Liberalization Go?**

The UK's intervention in the energy markets in favour of low-carbon energy sources is tantamount to renationalization. ... The costs of the pro-renewables policies in Europe are at last getting recognised by the authorities and we could at last be seeing a gradual movement back in favour of nuclear... Nevertheless, there remain some substantial challenges appearing in new and maybe unexpected quarters. For example, there is the new energy strategy in France which suggests a reduction in the nuclear share of electricity generation to 50% by 2025 (but without any obvious plan to get there). On the other hand, Russian actions in Ukraine suggest that the energy security argument in favour of nuclear in Europe remains as strong as ever....

...Citing market failures that prevent new nuclear build from supporting European goals for energy security, sustainability and emissions reductions, it demands a level playing field for all low-emission sources in the EU. Its timing is rather good and should fit in nicely with some expected support from this year's IAEA's World Energy Outlook, which will have at least one major chapter devoted to nuclear power's continuing important role.

**The UK is now encouraging new nuclear investment through a contracts-for-difference (CfD) mechanism, in which it sets a minimum guaranteed price for electricity. If that rises above standard market rates, the utility keeps the difference; if it falls below, the government provides compensation.**

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One section of the Czech letter relates specifically to an area where the UK has taken several policy actions in the recent past. ...The UK was one of the first countries to undertake electricity sector liberalisation (starting in 1989) and, although there have been ups and downs (the bankruptcy of the nuclear operator British Energy and its rescue by EDF stand out), the experience has been closely observed elsewhere. The UK is now encouraging new nuclear investment through a contracts-for-difference (CfD) mechanism, in which it sets a minimum guaranteed price for electricity. If that rises above standard market rates, the utility keeps the difference; if it falls below, the government provides compensation.

The UK is also gradually levelling a playing field that has formerly been very generous to renewables (which so far has largely meant onshore wind but has now spread to offshore wind projects too). Although the lead nuclear project (Hinkley Point C with EDF Energy as operator and main investor) isn't yet certain to go ahead, the belated support for nuclear from all the main political parties is certainly welcome....

There are, however, significant concerns about UK energy policy which threaten to cast a shadow over what is currently happening. This is quite apart from the investigation by the EU Commission

which has yet to report on whether the new UK policy in favour of nuclear constitutes illegal state aid. There is an increasing feeling within influential business and academic circles in the UK that energy policy since 1989 has been a costly failure and that more recent policy changes don't help; indeed, they could make matters worse.

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Costs are rising not because of market prices (European natural gas prices are relatively low today despite the continuing conflict over Ukraine and problems in North Africa) but largely because of government support for renewables, which is gradually feeding through to energy bills. The concern is that these costs will rise further as more offshore wind farms and eventually new nuclear come on stream, both of which have guaranteed prices more than double current wholesale power prices. Meanwhile US energy costs continue to fall owing to the exploitation of lots of unconventional oil and gas, to the competitive benefit of US industry and the detriment of companies here and across Europe. And unless shale gas can be seriously developed in the UK, the nation will continue becoming ever more reliant on imports of gas, some of which is liquefied and relatively expensive.

Despite all the effort and money devoted to the issue, greenhouse gas emissions in the UK government's figures are down only fractionally over a five-year period, and this fall can mostly be attributed to low economic growth. Coal consumption has been rising, as in Germany, and rising in the absence of an effective carbon price, which is certainly a perverse result of a supposedly environmentally-friendly energy policy. Vital investment in power generating capacity is down because incentives required to bring in private capital have been forced out of the system.

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**To act providently, the government is required to have very considerable knowledge. It needs to be able to accurately predict the path of future electricity prices and the ability to pick the technologies and projects with which to negotiate that path. Predicting the future price depends upon knowing the future path of costs, notably for gas.**

The government's latest remedy is to force National Grid to buy back-up generating capacity via a capacity payments mechanism to ensure that the lights will stay on.

With such a large number of policy measures, and all of the bureaucratic apparatus that they require, the UK seems to be effectively re-nationalising the whole electricity system.

The CfDs and the capacity

mechanism will be core components. But there are also new reviews of gas policy, the introduction of a smart metering programme (which is attracting huge scepticism), relaunch of the CCS policy, the EPS and the floor price of carbon mechanism. A whole host of other policies and interventions are either being developed or implemented....

To act providently, the government is required to have very considerable knowledge. It needs to be able to accurately predict the path of future electricity prices and the ability to pick the technologies and projects with which to negotiate that path. Predicting the future price depends upon knowing the future path of costs, notably for gas. Government ministers appear to be

amazingly confident of their 'knowledge' of the increasing levels and volatility of future gas prices. A realistic government would question the assumption that gas prices will inexorably rise when all the evidence is that gas-to-gas competition is breaking the link to oil prices. Most gas producers would say today that the price trend is down, not up.

Forecasting future gas prices is hazardous at the best of times, but it is much more so when

there are major changes in the structure of world gas supplies.... As the CfDs are long-term

contracts, they embody central government procurement on behalf of electricity customers who will be forced to pay for them. The central buyer can decide what to buy (which generation technologies), and what subsidies will be paid for each 'winner', based on what are in effect 'strike price plus' contracts. In the case of nuclear, government officials' public statements are confusing and could yet tie the government in knots with the EU Commission. There have been repeated statements in the House of Commons and elsewhere that "there will be no subsidy" for nuclear, while at the same time there have been claims that nuclear will be on a level playing field with other low-carbon technologies.

But subsidies of different levels are being and will be paid for all the other technologies in the low-carbon category. This raises interesting questions about how government decides a subsidy level on a case-by-case basis, how 'no subsidy' can be defined as 'equal subsidy,' and even how different subsidies for each low-carbon technology could be equalized. This is a real hornets' nest, and might be an irresistible target for nuclear opponents to try to stir up.

The capacity payments mechanism adds further complications. On behalf of the customers, the government will be procuring capacity not just via the CfDs but also via the capacity payments mechanism. So there will effectively be two different capacity mechanisms, each of which is assumed to address different market failures. In principle, if the two failures are different, new investments should be amenable to both (unless they uniquely accrue to specific technologies). The CfDs essentially enable nuclear to be procured alongside renewables.

The capacity mechanism arises out of two issues: the need for power stations (predominantly gas-fired) to back up wind power when there is no wind, and the fact that the intermittent nature of wind makes the requirement for operation of gas power stations also intermittent. That means that suppliers of gas, and investors in gas-fired power stations, cannot be sure if and when they will run. So the CfDs answer a nuclear problem while the capacity mechanism answers the gas problem.

Each technology has its own special 'sticking plaster', courtesy of HM Government.

The result is two different procurement mechanisms to solve a single problem, namely not enough generation capacity. This is one mechanism too many – it should have been possible to come up with a single unified system to cope. This situation is made a lot worse by wind farms avoiding having to pay for the system costs they so obviously cause. They do not provide (or pay for) firm capacity, with the result that all forms of electricity generation – even baseload supply like nuclear – are now threatened by the risk of becoming intermittent if annual renewable shares rise to 20% and above.

There will be major political issues in the future if nuclear and offshore wind projects go ahead today on the back of what later seem to be very high strike prices. ...The government is guaranteeing index-linked prices and guaranteed revenues to private companies at a starting point way above the current wholesale price for 20 years (or in the case of new nuclear for 35). How is this better than the arrangements the UK had under public ownership of electricity generation and supply before 1989? With performance incentives that allow suppliers and consumers a share of the benefits if the providers succeed in bringing costs and prices down, where is the competition in the system?

Despite so many initiatives and proposals, the British energy market is arguably no nearer to having a stable long-term energy and climate-change policy in place than in the past. There is much uncertainty about how onshore wind, offshore wind, nuclear and gas will fit together in the energy mix, together with concerns about security of supply and fuel poverty. The three policy objectives of energy security, cost & competitiveness and the reduction of emissions will remain, but for the last five years since the passage of the Climate Change Act of 2008, the priority in the UK (as in Europe) has been firmly set on the reduction of emissions. This now needs rebalancing, especially when new offshore wind power is being commissioned at a ridiculous £150 per MWh. Business in general is bothered both

by level of costs and by the way in which energy policy has been politicized, adding to uncertainty and increasing risks. The level of lobbying by different interest groups has become intolerable.

Perhaps the biggest market failure, from a long-term perspective, is insufficient investment in future technology. Perhaps the best thing the UK and other developed countries could do to help resolve a global problem is to invest in world-leading science that can help produce new ways of producing, storing and consuming energy. Some of our best scientists need to be incentivised to find a way to create an energy system that meets the UK's national goals.

Source: <http://www.neimagazine.com>, 02 September 2014.

**OPINION – Debalina Ghoshal**

**INF Treaty Coming Apart?**

According to former Bush administration official Stephen Rademaker, for the US to respond to Russian violations of the treaty by pulling out of it would be “welcome in Moscow,” which is “wrestling with the question of how they terminate [the treaty]” and thus, the US should not make it easier for the Russians to leave. After the 1962 Cuban Missile Crisis, when the Soviet Union and the U.S were on the brink of a nuclear catastrophe, both parties apparently realized the need for some nuclear arms control measures. The INF, which came into force in December 1987, requires that both the SU and the US eliminate their ground-launched, nuclear-capable ballistic and cruise missiles of ranges between 500-5500 km.

In recent times, however, both parties to the treaty, the US and Russia, have accused one another of failure to comply with it. The US has apparently been “concerned” regarding Russia's compliance with the treaty since 2011.

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In July 2014, reports stated that Russia had test-fired intermediate range cruise missiles of the model called the R-500 or the Iskander-K, and prohibited under the INF treaty.... The US seems justifiably alarmed by Russia's violation of the treaty. US President Barack Obama rated this violation “a very serious

matter.”... President Obama, however, wrote a letter to Russian President Vladimir Putin noting that the US would still not violate the INF treaty by deploying the prohibited INF-range missile systems. In addition, Russia also tested its RS-26 Rubezh ICBM several times for distances of about 2000 km, a range not permitted under the treaty.

The Russian Defense Ministry, however, responded that the RS-26 missile is a “new type” of ICBM — and not a prohibited intermediate range missile — and thus “legally unconstrained” by the treaty. ...Russian military political analyst, Andrey Koshin, added that the US had “used” the alleged violation “to boost global tensions in the background of the Ukrainian crisis and sanctions imposed on Russia.”

And the Russian FM alleged that US claims that Russia violated the treaty are based on “warped logic,” and made “with little or no evidence.” Russia, according to *Russia Today*, believes it faces threats — allegedly emanating from China, India, Pakistan, Iran and North Korea - from medium range missiles. Russia also might be concerned about the inclusion of Japan in the US missile defense strategy. ...Russia has, however, been provoking clashes with Japan by claiming ownership Japan's Kurile Islands. Japan does not possess ballistic missiles at present, however its space capabilities involve several technologies “that could potentially be adapted to develop long range missiles.”

Russia has also appeared “concerned” regarding the US missile defense system in Europe, under



the European Phased Adaptive Approach. The director of the department of non proliferation and arms control at the Russian Ministry of Foreign Affairs, Mikhail Ulyanov, evidently assuming that this missile defense system could negate Russia's nuclear deterrent capability, has announced that such a policy "can undermine strategic stability."

Despite US assurances that the missile defense system is not intended to be against Russia, but possibly against Iran, Putin, apparently not feeling reassured, has repeatedly threatened to withdraw from the treaty. "Missile defence systems [in Europe] are defensive only in name" Putin said. He added that these systems are a significant component of a "strategic offensive potential," and that this missile defense deployment was an attempt by the US to "create a new stage of American superiority in Europe" and "neutralize" Russia's nuclear potential. Russia has also accused the US of testing Hera missiles, which it claims are medium-range missiles. The production and flight-testing of these, under the Article 6 of the INF Treaty, are banned. The Russians seem

concerned that that the US "could considerably improve the capabilities of the Hera." Washington responded that Article 7 of the Treaty permits the use of "boosters systems."

Yuri Solomonov, a Russian expert and the chief designer of Russia's modern nuclear systems, also accused the US of testing other target missiles — the Long Range Air Launched Target (LRALT) and the (Medium Range Target) MRT, up to 2000 km and 1100 km range respectively — which could be a part of the Theater High Altitude Air Defence system to be deployed in US allied territories such as Japan and Taiwan in the Asia-Pacific region. Using target missiles in these ranges is apparently prohibited

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**The INF treaty has proven that it is indeed possible to eliminate an entire class of nuclear weapons systems. However, considering the pace at which INF category missiles are being developed by states such as China, India, Iran, Israel, and North Korea, how far Russia and the United States will continue to adhere to the treaty remains to be seen.**

in the INF treaty. Despite Russian FM complaints about them, Russia was "met with no response."

Russia also raised concerns over the MK41 Vertical Launching System, planned to be deployed in Romania and Poland. Russia apparently believes it could be used to

launch intermediate-range cruise missiles. The INF treaty has proven that it is indeed possible to eliminate an entire class of nuclear weapons systems. However, considering the pace at which INF category missiles are being developed by states such as China, India, Iran, Israel, and North Korea, how far Russia and the United States will continue to adhere to the treaty remains to be seen.

Source: <http://www.gatestoneinstitute.org>, 02 September 2014.

#### OPINION – Rizwan Asghar

##### Promoting Transparency

In 1944, famous Danish physicist Niels Bohr sent a letter to US President Franklin D Roosevelt, warning him about the urgent need to control fissile

materials by reaching an understanding at the international level. A year later, in July 1945, the US carried out the first-ever nuclear test, ushering the world into the nuclear age. After the SU conducted nuclear tests in 1949, Bohr sent another letter to the United Nations, emphasising the need to bring greater nuclear transparency as a means to build mutual trust among nuclear powers. Today, 70 years after Bohr's first warning, regulation of the use

of fissile material remains a distant dream. As of December 2013, the global stockpile of fissile material is estimated to be above 2,000 metric tonnes, which is enough to make tens of thousands of new nuclear weapons.



Lack of precise information regarding the exact number of nuclear weapons, their delivery systems and quantity of fissile material remains a major issue. Due to nuclear secrecy in most nuclear weapon states, much uncertainty surrounds the estimated figures. Over the past decade, the issue regarding the level of nuclear secrecy has become a serious subject matter in deliberations by the General Assembly's First Committee at the NPT Review Conferences (RevCon) and the Preparatory Committee (PrepCom) sessions. Some 'recognised nuclear-weapon states' voluntarily submit reports on their nuclear activities but there is absolutely no transparency in the non-NPT states.

During the Cold War era, nuclear secrecy was considered necessary for security. However, in the emerging era of nuclear terrorism, the lack of transparency has become a danger. After 1998, these concerns led the NPT review process to enhance the transparency of the nuclear disarmament process. In the year 2000, the NPT RevCon agreed upon "13 fundamental disarmament steps", calling upon all member states to increase transparency and submit regular reports on nuclear disarmament commitments. UN Secretary General Ban Ki-moon included nuclear transparency as the most important agenda item in his nuclear disarmament proposal in 2008. He urged all nuclear weapons states to report information about their fissile material stocks and nuclear arsenal to the UN Secretariat.

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However, his proposal was not heeded. In 2010, the NPT RevCon also took up the need to ensure nuclear transparency. In the 2012 and 2013 sessions of the NPT Preparatory Committee, two coalitions of states presented 'working papers' on transparency. This initiative once again caused global attention focus on the need to improve transparency regarding exact quantities of fissile materials and their production history. The utmost secrecy surrounding Pakistan's

nuclear programme has become a matter of serious concern for the international community, particularly since 2003... In the Pakistani media, information is generally shared only with 'friendly' analysts and journalists. Such lack of transparency may allow terrorist organisations to exploit weak links in the security of our nuclear arsenal but many Pakistani strategic thinkers remain in a state of denial regarding this threat. More or less the same culture of secrecy prevails in India and North Korea.

...The main goal of greater transparency is to restore public confidence by ensuring international accountability... Pakistan's nuclear security managers must not feel uncomfortable while sharing official and reliable information about the exact number of nuclear weapons and fissile material stockpiles so that measurable progress can be made toward nuclear disarmament. In the post-Cold War era, the search for hegemony through build-ups of nuclear arsenals should have given way to the need for acquiring collective security and the goal of a world without nuclear weapons. Many international forums, including the international Weapons of Mass Destruction (WMD) Commission, the Tokyo Forum, the International Panel on Fissile Materials and the International Commission on Nuclear Non-proliferation and Disarmament have stressed the dangers of huge nuclear arsenals and fissile material stocks being shrouded in secrecy.

Five NPT weapon states – the US, the UK, France, Russia and China – met in London (2009), Paris (2011), Washington DC (2012) and Geneva (2013) to discuss issues of increasing nuclear transparency and taking confidence-building measures in this regard. Some unilateral progress in improving nuclear transparency has been witnessed over the past few years but universal support is necessary to pressurise all nuclear

countries to share information about their arsenals. As a first step, all nuclear weapon states should officially declare the total number of weapons in their nuclear arsenals in the 2015 NPT RevCon, along with the commitment to release subsequent annual updates. Civil society activists and media in all nuclear weapon states must fearlessly pressurise their respective governments to take this first step. Ensuring nuclear transparency is a global responsibility and Pakistan must not shy away from playing its part in fulfilling that responsibility.

Source: <http://www.thenews.com.pk>, 03 September 2014.

**OPINION – Letty G. Lutzker**

**Nuclear Plant in New Jersey Essential to Support State's Economic Growth**

It is essential that a new nuclear electricity plant be planned for New Jersey. With the growing demand for electricity to power our state's increasingly digitized economy, the need to invest in nuclear power is more obvious than ever. A new plant built alongside PSEG's Salem and Hope Creek reactors in Salem County would create the largest nuclear power complex in the US. Abundant electricity available on demand 24/7 would put NJ in a favorable position for economic growth. The added bonus that nuclear energy production is non-polluting would free us from having to meet increasingly onerous and expensive anti-pollution requirements. Although coal accounts for only 6.6 percent of NJ's electricity production, the fuel share supplied by natural gas has reached 39.1 percent, and

**Civil society activists and media in all nuclear weapon states must fearlessly pressurise their respective governments to take this first step. Ensuring nuclear transparency is a global responsibility and Pakistan must not shy away from playing its part in fulfilling that responsibility.**

**Solar and wind energy do not have the capability for large-scale energy storage of the kind needed to provide "base-load" electricity around the clock regardless of weather conditions.... A study by the Brookings Institution shows that nuclear plants, which run at about 90 percent capacity, avoid almost four times as much greenhouse-gas emissions per unit of capacity as do wind turbines, which run at about 25 percent; and they avoid six times as much as solar arrays do.**

could rise to 50 percent or more. The Oyster Creek nuclear plant – which has produced electricity for 50 years – is scheduled to shut down by 2019. Without more nuclear power, NJ's dependence on natural gas, a fuel with a recent history of price volatility due to its growing industrial use, would increase significantly.

Solar and wind energy do not have the capability for large-scale energy storage of the kind needed to provide "base-load" electricity around the clock regardless of weather conditions.... A study by the Brookings Institution shows that nuclear plants, which run at about 90 percent capacity, avoid almost four times as much greenhouse-gas emissions per unit of capacity as do wind turbines, which run at about 25 percent; and they avoid six times as much as solar arrays do. Additionally, the land-use requirements for wind and solar installations should shock anyone who enjoys open green spaces. PSEG operates its three plants on only 740 acres on Artificial Island along the Delaware River. Supplying that amount of electricity with wind or solar requires hundreds of square miles. ...Most spent fuel is kept in above-ground concrete casks, where the highly radioactive material can be stored safely and securely for decades until a national storage facility opens. Currently, business interests in Texas and New Mexico are competing for the right to store the nation's used fuel in rural areas of their states, in hopes they will be able to accrue billions of dollars in storage fees.

PSEG has an application for a nuclear construction and operating license pending at the NRC. Although the cost of building a new nuclear plant is

high, consumers save money over the life of a plant, because nuclear fuel is much cheaper than natural gas or even coal and, therefore, the overall cost of producing nuclear-generated electricity is less. PSEG is well-positioned to use its knowledge and experience with nuclear power to replace generating capacity from aging power plants and meet a growing demand for electricity. Nationally, the need for power is projected to increase 29.5 percent by 2040, according to the Energy

**Since last November, Iran took major steps to fulfill most of its pledges made to the IAEA and give the inspectors access to nuclear related sites plus converted its stock of 20% enriched uranium. This means that Iran's most sensitive nuclear materials have been demolished. Also, reports say that Iran has started to reduce its stock of low-enriched 5% uranium over the past three months.**

Information Administration. Meeting this need will require the construction of scores of new power plants in the US. Expansion of nuclear power would also help ensure reliability and stability of the electricity grid, which can no longer be taken for granted. ...PJM (Pennsylvania-New Jersey-Maryland) recently placed a restriction on the amount of electricity being imported from other regions, mainly from the Midwest, to reduce its vulnerability to possible transmission failures.

...By reducing its reliance on imported power, PJM's goal is to spur construction of new power plants in the mid-Atlantic region. That would help reduce the need for imported power produced from fossil fuels and encourage the growth of nuclear power, which would be beneficial to the economy, public health and the environment. It is past time to launch construction of a new nuclear plant – the best option for large-scale production of reliable electricity.

Source: <http://www.nj.com>, 08 September 2014.

**OPINION – Camelia Entekhabi Fard**

**Will Iran's Nuclear File Soon Become a Distant Memory?**

While Iran's nuclear negotiating team tirelessly cross continents to solve remaining issues before the interim agreement expires on November 24,

the IAEA has said that Iran failed in part to answer their inquiries. Actually, Iran didn't fail totally, but "failed to address concerns about alleged suspected research on atomic bomb by an agreed deadline," The UN nuclear watchdog said on 5 September. The unanswered question is relevant to the possible military dimensions of Iran's nuclear program. The Islamic Republic has implemented just three of the five nuclear steps that it was supposed by August 25 under a confidence-building

deal that was reached with the IAEA in November. ...The two remaining issues are alleged experiments on explosives that could be used for an atomic device and studies related to calculating nuclear explosive yields.

**Major Steps:** Failing to meet a deadline could jeopardize progress made over the past year. Since last November, Iran took major steps to fulfill most of its pledges made to the IAEA and give the inspectors access to nuclear related sites plus converted its stock of 20% enriched uranium.

...This means that Iran's most sensitive nuclear materials have been demolished. Also, reports say that Iran has started to reduce its stock of low-enriched 5% uranium over the past three months.... Iran has had two bilateral talks with the US in

August and September, and high level ministerial talks between Iran and the six major powers will resume in New York on September 18. Also, Iran's chief negotiator Mohammad Javad Zarif will hold another set of talks in Vienna on Sept 11 with three European countries before heading to New York.

All evidence shows that Iran is serious about building trust and showing transparency to achieve the comprehensive deal.

**IAEA Worries:** The IAEA asked why Iran was developing "bridge wire" detonators, which can

be used to set off atomic explosive devices, and Iran says they are for civilian uses such as in the oil and gas industries.... Iran always denied having such a plan and even if they has one, they would never admit it at this stage.... If the world powers decide to reach the comprehensive deal with Tehran, even with these two remaining questions, the nuclear file can be consigned to history. With the rise of the most dangerous trend of terrorism in Iraq and Syria - ISIS- and as an immediate threat to the US and the Western powers' national security, a peaceful Iran can be considered a major help in the rejoin. Iran has all the ability to act on behalf of the US (the military and intelligence ability) unilaterally. US air support and advice is helpful but not necessary. Solving the nuclear file could make it easier for Iran's government to cooperate with the West over some important issues such as ISIS. Contact with the US would be justifiable to hardliners in Iran.

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**The US has often made its stand clear indirectly through the NSG regarding the condition that India sign the NPT for full-fledged cooperation agreements to fructify. It had covered the ground well through a clause in Section 123 of the US Atomic Energy Act, which makes it subject to the US President certifying annually that India has not diverted additional uranium for strategic applications.**

Source:<http://english.alarabiya.net>, 08 September 2014.

#### OPINION – M K Iyer

#### The Path to Nuclear Power

This refers to the report "India, Australia sign civilian nuclear energy deal" (September 6). If one reads between the lines, the Indo-Australian civil nuclear deal is much ado about nothing. It is reported that the agreement may take five years to fructify and even then, the flow will be notional. For 63,000 Mw envisaged by 2032, the natural uranium required is 2,000 tonnes a year, 30 per cent of Australian production of 6,350 tonnes of

uranium in 2013. Indian domestic uranium at current production rates can sustain 10,000 Mw, even if it is committed only for electricity generation. Thus, it is doubtful if the notional flow of uranium planned after five years will meet the requirements. It is another matter whether the plans to add around 60,000 Mw by 2032 are realistic. The stated requirement of around 30 reactors in 18 years is not even arithmetically aligned; meeting that target would need at least 60 reactors in 18 years.

The fact is that the US has its own agenda in operationalising the nuclear agreement with India. It snugly operates through the NSG.... Now, the NSG had stated that the minimum requirement for opening India to its fold is that we sign the NPT, CTBT and FMCT. India cannot agree to any of these at any time. Thus, the agreement between Australia and India could not be bilateral but trilateral, involving

the NSG, since Australia is bound to the latter.

The US has often made its stand clear indirectly through the NSG regarding the condition that India sign the NPT for full-fledged cooperation agreements to fructify. It had covered the ground well through a clause in Section 123 of the US Atomic Energy Act, which makes it subject to the US President certifying annually that India has not diverted additional uranium for strategic applications. Since the Indo-US agreement was signed eight years ago, the US President has not been known to have made any such certification, and the US Senate can even consider the agreement void if required. It could consider any bulk import of Australian uranium as enabling



India to commit more of its indigenous uranium production to weapon applications. Australia does not have any technological capability in the sector comparable to India, except that it happens to have plenty of uranium and is under the NSG umbrella. It also had to look to the US to wink at the deal, as is clear from the recent statement that it is cutting off uranium supplies to Russia in line with US wishes. No doubt, the path to realising nuclear electricity targets is full of ifs and hows, but let us keep our hopes flying and be content with umbrella agreements couched in diplomatic language.

Source: <http://www.business-standard.com>, 08 September 2014.

## **NUCLEAR STRATEGY**

### **INDIA**

#### **India not Revisiting its Nuclear Doctrine, Modi Assures Japan**

Keeping in view Tokyo's nuclear sensitivities on the eve of his visit to Japan, PM Modi has stressed that India is not revising its nuclear doctrine. ...PM Modi said, "While every government naturally takes into account the latest assessment of strategic scenarios and makes adjustments as necessary, there is a tradition of national consensus and continuity on such issues. I can tell you that currently, we are not taking any initiative for a review of our nuclear doctrine."

India is trying to work out a civil nuclear agreement with Japan, which is proving to be extraordinarily difficult, because of Tokyo's insistence on more comprehensive non-proliferation commitments. The prospect that the NDA government may revise the "no first use" component of India's nuclear doctrine had scared them off even more. In its election manifesto, the BJP had declared its intent to "revise and update" India's nuclear doctrine,

formulated a year after the 1998 Pokhran-II tests under the Vajpayee government with "no first use" and "non-use of nuclear weapons against non-nuclear weapon states" as its touchstones.

... Reiterating New Delhi's stand on NPT being discriminatory, the PM stated, "We are committed to maintaining a unilateral and voluntary moratorium on nuclear explosive testing." "There is no contradiction in our mind between being a nuclear weapon state and contributing actively to global nuclear disarmament and non-proliferation. India remains strongly committed to universal, non-discriminatory, global nuclear disarmament. Our track record of non-proliferation is impeccable. We will continue to contribute to the strengthening of the global non-proliferation efforts. India's membership of the four international export control regimes will be conducive to this," Modi said. ...

Source: <http://timesofindia.indiatimes.com>, 30 August 2014.

**There is no contradiction in our mind between being a nuclear weapon state and contributing actively to global nuclear disarmament and non-proliferation. India remains strongly committed to universal, non-discriminatory, global nuclear disarmament.**

#### **India Successfully Test-fires Indigenously Built Nuclear Capable Agni-I Missile**

India successfully test-fired its indigenously built nuclear capable Agni-I missile on 11 September, which has a strike range of 700 km, from a test range off Odisha coast as part of a user trial by the Army. The surface-to-surface, single-

stage missile, powered by solid propellants, was test-fired from a mobile launcher at about 11.11 hrs from launch pad-4 of the ITR at Wheeler Island, about 100 km from here, DRDO spokesman Ravi Kumar Gupta said.

Describing the trial as fully successful, Gupta said the Ballistic Missile was launched by the SFC of the army as part of a training exercise. "The entire exercise was conducted in a perfect manner and the trial was totally successful," he said. "The DRDO developed medium range ballistic missile from the production lot was launched as part of regular training exercise by the armed forces,"

said another official. Agni-I missile has a specialised navigation system which ensures it reaches the target with a high degree of accuracy and precision. The missile, which has already been inducted in to Armed Forces has proved its excellent performance in terms of range, accuracy and lethality. Weighing 12 tonnes, the 15-metre-long Agni-I, which can carry payloads up to 1000 kg, has already been inducted into the Indian Army. ...

Source: <http://www.dnaindia.com>, 11 September 2014.

## RUSSIA

### Russia to Conduct More Nuclear Drills

Russia announced its nuclear forces will conduct a drill along the border with China later this September 2014. Russia's nuclear forces will hold another large-scale exercise this September along the country's border with China... "There will be more than 4,000 military personnel and around 400 pieces of hardware involved in the exercises," Maj. Andreyev, a spokesman for the Defense Ministry's Strategic Rocket Forces, was quoted as saying. He added that the drills would be conducted in the Altai Region of Siberia. ...In announcing the drills on 03 September 2014, Maj.

Andreyev emphasized that air power would play a large role in the exercises. "It is the first time that an extensive use of the Air Force, including supersonic jets Mig-31, has been planned in the exercises of that kind," he said. Russia will also use SU-24s for air reconnaissance operations during the exercises.

Maj. Andreyev went on to say the purpose of the drills "is to practice operations to rebuff

subversive activities and attacks made by a presumed enemy with the use of high-precision weapons and fulfill combat tasks despite the enemy's strong radio-electronic resistance and active operations the enemy conducts in the area where the strategic troops are deployed." Russia's nuclear forces have been active this 2014, previously conducting a massive exercise in March and another one in May 2014. Since returning to power in the Kremlin, President Vladimir Putin has stressed the importance of Russia's nuclear arsenal even as he has sought to modernize its conventional forces. ...Russia's nuclear doctrine does not rule out the possibility of Moscow using

nuclear weapons to counter a conventional attack against Russia itself or one of its neighbors. Throughout the Ukraine conflict this 2014, Russian officials have issued increasingly belligerent nuclear threats against Kiev and its Western allies. Earlier, a Russian military official also announced that Moscow is in the process of revising its military doctrine, which was last revamped in 2010.

Source: <http://thediplomat.com>, 05 September 2014.

### Russia's Modified Military Doctrine Not Providing for Preventive Nuclear Strikes

The provisions of Russia's updated military doctrine concerning the use of Russian nuclear weapons, do not and cannot presuppose preventive nuclear strikes.... The former Russian First Deputy Minister of Defense and Chief of General Staff was commenting on the recent media reports, claiming that "Russia's new military doctrine will not contain provisions on preventive nuclear strikes and potential enemies." Baluyevsky is a member of a special working group set up within the framework of the Russian Security Council to introduce

**The purpose of the drills "is to practice operations to rebuff subversive activities and attacks made by a presumed enemy with the use of high-precision weapons and fulfill combat tasks despite the enemy's strong radio-electronic resistance and active operations the enemy conducts in the area where the strategic troops are deployed." Since returning to power in the Kremlin, President Vladimir Putin has stressed the importance of Russia's nuclear arsenal even as he has sought to modernize its conventional forces.**

amendments to the doctrine, which was last updated in 2010. Baluyevsky stressed that, according to the current doctrine, "Russia reserves the right to use nuclear weapon in response to the use of nuclear or other weapons of mass destruction against it or its allies, or in case of use of regular weapon, which threatens the existence of the entire state [of Russia]."

On 02 September 2014, the Russian Security Council announced that Russia will update its military doctrine by the end of 2014 to reflect new security threats, including the expansion of NATO, US missile shield plans and the political crisis in Ukraine. According to the council, the amendments will also touch upon Russia's independence in producing weapons, hardware and other military equipment production.

Source: <http://en.ria.ru>, 05 September 2014.

**BALLISTIC MISSILE DEFENCE**

**IRAN**

**Pentagon Report says Iran is Fielding Anti-ship Ballistic Missiles**

Iran's Khalij Fars anti-ship ballistic missile (AShBM) – a weapon that could shift the military balance in the Gulf region – is being delivered to operational units, according to the US Department of Defense's annual report.... "Tehran is quietly fielding increasingly lethal symmetric and asymmetric weapon systems, including more advanced naval mines, small but capable submarines, coastal defence cruise missile batteries, attack craft, and anti-ship ballistic missiles".... This is the first corroboration of Iranian claims that the AShBM is in service. US officials declined to comment further on the report, which was submitted to Congress in January.

The Khalij Fars is a version of the Fateh-110 tactical ballistic missile with an electro-optical (EO) seeker

that enables it to home in on a ship's infrared signature in its terminal phase. The Iranian media has reported that the missile has the same 300 km range and 650 kg warhead as the more recent versions of the Fateh-110.

Analysts have previously been sceptical of Iran's AShBM programme. ...The CSIS report said Iran did not have an effective way to acquire and track over-the-horizon targets so that the missile's guidance system could be programmed and then updated during flight to ensure its seeker could find the target in its terminal phase.

It nevertheless said: "Iran potentially could alter the regional naval balance if it ever did reach such a level of sophistication in guidance, range, reliability, and operational accuracy."

Source: <http://www.janes.com>, 08 September 2014.

**SOUTH KOREA–USA**

**Korea, US to Discuss Missile Defense**

The transfer of wartime operational control and missile defense cooperation may top the agenda should the national security chiefs of South Korea and the US meet for their first official bilateral

meeting in Washington...are expected to discuss the delay in the OPCON transfer and Washington's wish to deploy to the peninsula an advanced missile defense system, called Terminal High-Altitude Area Defense, analysts said. The meeting is likely to be held later this September before the allies' defense chiefs meet in October 2014 at their annual Security Consultative Meeting, where they are expected to determine the timing of the OPCON transfer, currently scheduled for December 2015....

Analysts say that the transfer may be delayed until after the early 2020s, when the South is expected to have completed building its low-tier Korea Air and Missile Defense program and "Kill

**According to the current doctrine, "Russia reserves the right to use nuclear weapon in response to the use of nuclear or other weapons of mass destruction against it or its allies, or in case of use of regular weapon, which threatens the existence of the entire state of Russia." Russia will update its military doctrine by the end of 2014 to reflect new security threats, including the expansion of NATO, US missile shield plans and the political crisis in Ukraine.**

Chain" preemptive strike system. Seoul requested a delay in the OPCON transfer in 2013 after Pyongyang conducted a third nuclear test and staged a series of saber-rattling moves including repeated missile and rocket launches. Initially scheduled for April 2012, the transfer was first delayed to 2015 in June 2010 amid Pyongyang's continuing provocations. The US' pursuit of THAAD deployment to the South is also a major pending issue facing the allies. Washington has been considering placing the core asset of the multilayered US missile defense program on the peninsula to better deal with the North's increasing missile threats. But Seoul has been concerned that the deployment could hurt its ties with China and Russia, which believe THAAD may potentially target them.

**Seoul has been concerned that the deployment could hurt its ties with China and Russia, which believe THAAD may potentially target them.**

Yonhap said that the US had finished a site survey in South Korea to find out whether it is feasible to deploy the THAAD system here.... The major source of controversy is a land-based radar that is embedded with the THAAD interception system. The AN/TPY-2 radar has a maximum detection range of 1,800 km. Beijing and Moscow think that the radar could be used to glean intelligence about their militaries. Amid rising concerns over possible diplomatic frictions with China and Russia, Seoul has stressed that it would focus on developing its own low-tier multiple interception missile shield and would not join the global US MD program. Meanwhile, the White House said on 07 September 2014 that the US policy toward the North remains unchanged, and reiterated that the communist state should show its denuclearization commitment through action if it wants to resume the multilateral aid-for-denuclearization talks. "US principles in this regard remain the same and unchanged. North Korea must show it is serious

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and prepared to abide by its commitments, particularly concerning denuclearization, before authentic and credible negotiations are possible." The statement came as North Korea's Foreign Minister Ri Su-young was preparing to travel to the US to attend the meeting of the UN General Assembly to begin in mid-September. His visit would mark the visit to US by a North Korean foreign minister in 15 years.

Source: <http://www.koreaherald.com>, 01 September 2014.

## NUCLEAR ENERGY

### CHINA

#### China's New Nuclear Baby

China has formally launched its first indigenous nuclear power reactor design, with some French ancestry but born of two major internecine contests.... The Hualong One reactor design has passed its design certification by the NNSA and has now been launched with some fanfare by the NEA which brought it about by high-level edict. The story starts in 2004 when the State Council approved building two power plants with Generation-III technology from overseas to step decisively ahead of the imported technology and first iteration of indigenous reactor designs then in operation. Despite strong representation that China should go it alone technologically, an international open bidding process was undertaken. This asserted China's readiness to be part of the global nuclear industry, while some in China remained somewhat ambivalent about that.

The new SNPTC, directly under the State Council, was in charge of technology selection for new plants from overseas.



Some 200 experts spent over a year evaluating reactor designs and in September 2006 most votes were for the Westinghouse AP1000. This then became the main design for China's nuclear future, endorsed at the highest level. Four reactors are now well advanced in construction, and SNPTC has presided over evolving the design to a larger CAP1400 with full Chinese intellectual property rights. But meanwhile CNNC had been working with others since the early 1990s to develop an indigenous 1000 MWe design

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based on the smaller units at Qinshan, which had started up from 1994. The decision to go for the AP1000, early in 2007, saw CNNC's main engineering support redirected to the AP1000, leaving CNNC stranded in its ambition to create its own brand of reactor with Chinese intellectual property rights. But after a few years' hiatus, CNNC resumed development of its design and in October 2011 announced that its independently-developed ACP1000 was entering the engineering design stage.

CNNC's ambitions were being matched by China Guangdong Nuclear Power Corporation (now China General Nuclear – CGN) which was busy developing the French M-310 design it had built at Daya Bay and Ling Ao. This was very successful and became the CPR-1000, with a nearly-complete domestic supply chain, but it was still basically a Generation-II reactor, with Areva retaining some intellectual property rights which prevented export.

**This desired 'rationalisation' of reactor designs was supported by greater commonality in ownership of the two companies as ordered in September 2012. Beijing asserted its authority and took over 82% of CGN, reducing provincial ownership to 10%.**

The CPR-1000 was being widely and quickly deployed for domestic use, with 57 likely to be built, as of the end of 2010. But following the Fukushima accident, there will be no further approvals, since Generation-III is the new criterion. Six CPR-1000s are now operating and 16 are under construction. Since it was the only

domestic design of its size, it is being built by CNNC as well as CGN, which was developing it towards Generation-III status with full Chinese intellectual property rights.

So in 2011 State Council and its NEA were faced with the two major nuclear utilities, CGN and CNNC, sponsoring rival 1000 MWe class designs, the Guangdong CPR-1000 well proven, the ACP1000 still only on paper. At the same time, the companies were geographically diverse, with CNNC based in Beijing, and

CGN based in Shenzhen, Guangdong province, where the local government held a 45% stake. This desired 'rationalisation' of reactor designs was supported by greater commonality in ownership of the two companies as ordered in September 2012. Beijing asserted its authority and took over 82% of CGN, reducing provincial ownership to 10%.

Accordingly, Beijing ordered the two companies to merge their designs into one, with Generation-III credentials, while allowing for minor differences. This was a challenge, since the cores are very different: the ACP1000 design has 177

fuel assemblies 3.66 metres long, the ACPR1000 has 157 assemblies 4.3 metres long. In the event the ACP1000 core design prevailed, though it was less mature. This is the new flagship – Hualong One – although CGN and CNNC still maintain their own supply chains, supporting 85% local content, and some features developed by CGN for its Advanced CPR-1000 will be

incorporated into its versions of Hualong One.

The NEA, NNSA and National Development and Reform Commission have now confirmed that the Hualong One meets all technology requirements for a Generation-III reactor with full Chinese intellectual property rights and good export potential. They urged early deployment of

demonstration units in China to prepare the way for exports as “an important brand” for Chinese nuclear technology. The first units will be built at Fangchenggang – units 3 and 4 (by CGN) followed by Fuqing 5 and 6 (by CNNC). Although it is still officially listed as being ACP1000, Pakistan’s Karachi Coastal Power stations are likely to be the first export Hualong units.

**The 220 MW reactor has beaten an American unit which ran for 739 days at a stretch. Unit-5 at Rawatbhata, a PHWR made at a cost of Rs. 1200 crore in 2010, is run by the NPCIL and is now ranked number two globally for continuous generation of electricity by a nuclear plant.**

Source: <http://www.world-nuclear-news.org>, 02 September 2014.

**INDIA**

**Rajasthan Nuclear Plant Makes History, Runs Uninterrupted for Over 2 Years**

An indigenously made nuclear plant in Rajasthan has created history by running continuously for a period 765 days, or a little over two years. Usually, most nuclear plants globally need to be shut down every year for maintenance; only well-maintained facilities can run for longer periods. (10 Must-Know Facts About India’s Nuclear Milestone) With this achievement, the 220 MW reactor has beaten an American unit which ran for 739 days at a stretch. Unit-5 at Rawatbhata, a PHWR made at a cost of Rs. 1200 crore in 2010, is run by the NPCIL and is now ranked number two globally for continuous generation of electricity by a nuclear plant. The pole position is still held by a Canadian reactor, Ontario Power Corporation’s Pickering-7 plant, which ran continuously for 894 days before it was shutdown in 1994. The PHWRs are a type of reactors that are easier to run for longer periods as fuel can be added into the reactor without shutting them down for maintenance.

The world is lauding India on its achievement. “The achievement of Rajasthan’s Unit-5 is another excellent example of how nuclear energy supplies clean, affordable and reliable electricity around

the world”.... In this 765-day period, the reactor produced about 4258 million units of electricity, lighting up nearly 2.5 million homes in Rajasthan and Uttar Pradesh. The NPCIL earned Rs. 1225 crore by selling the electricity generated by the Rawatbhata plant. According to estimates, this was more than the cost of installing the plant. The reactor is expected to run for a full life of more than 40 years. Every year, the cost of fuelling and maintaining it comes to about Rs. 230 crore and it supplies electricity to the grid at a fixed tariff of Rs. 3.43 per unit. On the flip side, it generates about 33 cubic meters of radioactive waste year by burning 40 tonnes of natural uranium every year. This waste can remain dangerous for a very long time.

Basking in the after-glow of the nuclear milestone, Sinha, Chairman of the AEC said, “There is no release of carbon dioxide in the process of power generation from any of the nuclear power reactor including RAPS-5. The nuclear power is a clean and green source of energy which indeed is helpful in reducing the carbon emission in the environment.” The NPCIL too points out that in the 765-day period, 4.25 million tonnes of carbon dioxide emission was avoided.... The reactor used 82 tonnes of uranium to produce the power output. In comparison, to generate a similar quantity of electricity in a thermal plant, a whopping over 3 million tons of coal would have been required. After this record-breaking dream run, the plant will now be shut down for routine maintenance and safety checks.

Source: <http://www.ndtv.com>, 06 September 2014.

**Kudankulam Nuclear Plant Second Unit to Start Fission in November**

The second 1,000 MW unit at the KNPP is expected to start fission process in November while the first unit is yet to restart power generation, according

**The second 1,000 MW unit at the KNPP is expected to start fission process in November while the first unit is yet to restart power generation, according to the project operators. According to the NPCIL, the second unit whose physical progress is 97.49 percent complete is expected to go critical in November 2014.**

to the project operators. According to the NPCIL, the second unit whose physical progress is 97.49 percent complete is expected to go critical in November 2014. The NPCIL, instead of its usual practice of specifying the unit's expected date of commercial operation, has this time given the expected date of the plant attaining criticality. Prior to that, the operator has to do a series of tests like hot run of the nuclear steam supply systems, removal of the dummy fuel (fuel assemblies that are exact replica of actual nuclear fuel assemblies, both in dimension and weight but without uranium) loading of the actual fuel and others....

During the hot run process, the nominal parameters of the plant are achieved and tests are conducted for design evaluation of the plant. After this, the nuclear fuel is loaded and the reactor is made critical, the time when the fission process starts. Curiously, the time gap between these operations was a couple of months when the first unit started the fission process. Meanwhile, the first unit, that was shut down for maintenance works in mid-July, is expected to start power generation September 10, according to Power System Operation Corporation Ltd. Recently, the AERB gave its permission to restart the unit. India's atomic power plant operator NPCIL is setting up two 1,000 MW Russian reactors at Kudankulam in Tirunelveli district. The total outlay for the project is over Rs.17,000 crore. The KNPP is India's first pressurised water reactor belonging to the light water reactor category. The first unit attained criticality in July 2013.

Source: <http://www.ndtv.com>, 07 September 2014.

### **China, Korea Offer Nuclear Reactors**

China and South Korea have offered India nuclear reactors on its terms at a time New Delhi remains locked in differences with the US and France over its controversial nuclear liability law that could

shadow Prime Minister Narendra Modi's forthcoming visit to Washington. Beijing has told New Delhi it is willing to sell its reactors without seeking any amendment to India's liability law and President Xi Jinping is likely to repeat the offer when he arrives in New Delhi.

South Korea had first made its offer earlier this year, and has repeated it at least thrice. India is not inking any agreement now on purchasing reactors from China or South Korea because its negotiators are already stretched struggling to convince the US to accept the liability law, and fixing a price for reactors with the French. But India is also not turning down the offers that bolster its bargaining leverage at a time the complexities of nuclear economics, coupled with domestic politics, are holding back the implementation of landmark deals New Delhi struck with Washington and Paris in 2008.

...  
Source: Excerpted from article by Charu Sudan Kasturi, <http://www.telegraphindia.com>, 11

September 2014.

### **JAPAN**

#### **Japanese Regulator Approves Restart of First Nuclear Reactors**

Japan's nuclear regulator gave the go-ahead for the restart of a nuclear power station, the first step to reopening an industry that was mothballed after the Fukushima disaster and which may involve the definitive closure of a dozen old plants. The NRA said Kyushu Electric Power's two-reactor Sendai plant in southwestern Japan could restart, although that still needs the approval of local authorities.

Japan is nearing the end of its first full year without nuclear power since 1966 and public mistrust of the sector remains high after the 2011 Fukushima disaster, the worst since Chernobyl in

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1986. The government is pressing regulators to make the tough decision on whether to decommission the oldest of the country's 48 reactors, which face higher safety hurdles than the rest. Weeding out reactors that are 40 years old or more may help win public trust in the rest of the industry.

... The government has been pressing for the restart of reactors that receive safety approval from the NRA to reduce Japan's reliance on expensive imported fuel. The push for a reckoning on some plants is "clearly part of the strategy by the government and utilities to send a signal to the people of Japan that they are listening and taking into account the lessons of Fukushima", said prominent nuclear-power critic Arnie Gunderson, director of Fairewinds Energy Education. "But it also reflects the challenge faced by utilities in finding the funds to bring older reactors to a standard that can pass NRA approval," Gunderson, a veteran US nuclear engineer who turned against nuclear energy for safety reasons, said by email.

Under post-Fukushima rules, reactors are supposed to be decommissioned after 40 years. They can receive a 20-year extension but that is subject to more rigorous and costly safety regulations. As many as two-thirds of Japan's 48 idled nuclear units may never return to operation because of the high costs, local opposition or seismic risks, while one-third will probably come back online eventually, a Reuters analysis showed this year. The NRA gave its final safety clearance at a meeting on Wednesday for the Sendai plant after granting the two-reactor power station preliminary approval in July.

**Local Hesitation:** While the approval certifies the upgraded design and safety features of the reactors, the units, which have been shut for more

**Under post-Fukushima rules, reactors are supposed to be decommissioned after 40 years. They can receive a 20-year extension but that is subject to more rigorous and costly safety regulations. As many as two-thirds of Japan's 48 idled nuclear units may never return to operation because of the high costs, local opposition or seismic risks, while one-third will probably come back online eventually.**

than three years, will still have to undergo operational safety checks and be given the green light by local authorities. The mayor of Satsumasendai, where the Sendai plant is located, and the governor of Kagoshima prefecture are in favour of reopening the plant, but residents remain concerned over evacuation plans. Activists have also said that the regulator has done little to vet volcanic risks near the Sendai plant. Japanese media have said the restart of the Sendai plant, about 1,000 km (600 miles) southwest of Tokyo, may not come until next year. Utilities

that want to extend the operating life of old reactors must submit detailed safety applications by July 2015, explaining how those facilities could be updated to meet the tough new safety standards. ...

Source: <http://zeenews.india.com>, 10 September 2014.

**SAUDI ARABIA**

**Saudis Announce Plan to Build 1st Nuclear Reactor**

Energy officials in Saudi Arabia announced on 02 September 2014 that they are embarking on a plan to build a nuclear reactor "for peaceful purposes".... Senior sources in the Muslim kingdom told...that construction of the reactor is expected to begin before the end of the calendar year 2014. "Construction of the first Saudi nuclear reactor will take ten years, according to the plan....

**The kingdom's goal is, in fact, 16 nuclear power reactors, "to be built over the next 20 years at a cost of more than \$80 billion, with the first reactor on line in 2022." The Saudis hope to reach "17 GWe of nuclear capacity by 2032," which would supply 15 percent of their projected needs by then.**

The kingdom's ultimate goal, the report stated, is to establish four nuclear reactors throughout the country. Meanwhile, nuclear industry monitor, the WNA said, in a

report released in May 2014, that the kingdom's goal is, in fact, 16 nuclear power reactors, "to be built over the next 20 years at a cost of more than



\$80 billion, with the first reactor on line in 2022." The Saudis hope to reach "17 GWe of nuclear capacity by 2032," which would supply 15 percent of their projected needs by then.

Source: <http://www.algemeiner.com>, 02 September 2014.

## URANIUM PRODUCTION

### INDIA

#### **Jharkhand Orders Uranium Mine Shut, Supplies Hit**

A government crackdown on irregular mining has forced the shutdown of India's oldest uranium mine in Jharkhand, hitting supplies worth about 700 tonnes a day to nuclear power plants as well as the country's strategic programme.... The state-owned Jaduguda mine, operating since 1967, has been the backbone of India's uranium production, and a source of employment for hundreds of people in a remote region. "If this situation persists for long, the country's nuclear programme will certainly suffer and nuclear power production will get a severe jolt," said Roy, adviser to UCIL, which runs the mine.... Following a May 15 Supreme Court order, the Centre had asked states to clamp down on mines operating without proper licences. 12 iron-ore mines in West Singhbhum district were shut, including mines of Tata Steel, Steel Authority of India Ltd and Orissa Mines and Minerals Company.

"The Jaduguda mine has the reputation of best recovery of 35%-40% among other uranium mines in the area," said Roy, adding that UCIL got a mining lease for 20 years in 1967. The lease was later renewed for another 20 years. In 2007, UCIL had applied for renewal of the lease. Under present laws, a lapsed mining lease is deemed

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**In 2007, UCIL had applied for renewal of the lease. Under present laws, a lapsed mining lease is deemed as extended if the government does not respond to a renewal request within a stipulated time. In May, the Supreme Court rendered all mining leases that expired in 2007 but still operating under the "deemed extended" status as illegal.**

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Source: <http://www.hindustantimes.com>, 09 September 2014.

## NUCLEAR COOPERATION

### ARGENTINA-CHINA

#### **Argentina and China Sign Nuclear Cooperation Deal for Atucha III**

In the second day of meetings with local authorities and businessmen in Beijing, the Argentine delegation signed a bilateral agreement to impulse the building of Atucha III power plant using Chinese investment funds...the deal involves a founding estimated in two billion dollars, aimed for Chinese products and services, including a third a country, and 32 billion dollars in Argentine origin suppliers. The new nuclear plant will be run via a CANDU reactor through natural uranium and heavy water, and is expected to reach a power capacity close to 800 megavolts. The complex will be built in Lima town, Buenos Aires province. Earlier on 03 September 2014, the Chinese government assured the judicial dispute between holdouts and Argentina "will not affect"

their investments in the country, as result of the "strategic association" which unites the two nations....

Source: <http://www.buenosairesherald.com>, 03 September 2014.

### CHINA-ROMANIA

#### **Romania, China to Sign Civilian Nuclear Agreement**

China and Romania further deepened their ties in the

nuclear power sector. ...Officials from both countries soon planned to sign an intergovernmental agreement on the peaceful use of nuclear energy. The pact comes as Romanian PM Ponta visited China and encouraged further investment in his country, including in the nuclear power sector. The agreement is a continuation of earlier negotiations for Chinese involvement in the construction of additional reactors at Romania's Cernavoda plant. Both operating units at the site are Canadian Candu 6 heavy water reactors, and the Romanian government has been seeking partners to complete two more partially built units. In 2013, CGNPG has signed agreements with Romania's Nuclearlectrica to provide non-nuclear equipment and potentially take a majority ownership stake in the project.... In July 2014, a CGN subsidiary signed a cooperation agreement with Candu for the Chinese company to build two additional Candu 6 reactors at the plant.

*Source : <https://nuclearstreet.com>, 02 September 2014.*

**INDIA-AUSTRALIA**

**India, Australia Sign Civilian Nuclear Energy Deal**

Uranium shipments might not start before 2-5 years; supplies might be limited. Adding another feather to its foreign policy cap, the NDA government under PM Modi on 05 September 2014 signed a civil nuclear agreement with Australia to address India's growing need for power. The deal, signed in the presence of Modi and visiting Australian PM Abbott, officially marked an end to the ban imposed by Australia

**The deal, signed in the presence of Modi and visiting Australian PM Abbott, officially marked an end to the ban imposed by Australia on selling uranium to India. The ban was lifted in 2012, when talks for the nuclear deal began. This will be the first such deal signed by the NDA government. India has similar agreements with the US, Canada, the UK, South Korea and France, among other countries.**

**The agreement will promote cooperation in peaceful uses of nuclear energy. It recognises India's commitment and use of nuclear energy with a view to achieving sustainable development and strengthening energy security. Australia can play the role of a long-term reliable supplier of uranium to India. It provides for supply of uranium, production of radio isotopes, nuclear safety and other areas of cooperation.**

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"The signing of the civil nuclear cooperation agreement is a historic milestone in our relationship. It is a reflection of a new level of mutual trust and confidence in our relationship and will open a new chapter in

our bilateral cooperation. It will support India's efforts to fuel its growth with clean energy and minimise its carbon footprint," Modi said after a meeting with his Australian counterpart. Abbott said the deal would "finally allow Australian uranium sales to India". He added the decision to sale uranium to India was "originally an initiative of the Howard government, now brought to fruition by the Abbott government", referring to

his Liberal Party predecessor Howard, PM of Australia in 1996-2007.

The MoU for the deal, Cooperation in the Peaceful Uses of Nuclear Energy, was signed between Sinha, secretary, department of atomic energy, and Suckling, Australia's high commissioner to India, following a meeting of the two PMs here. "The agreement will promote cooperation in peaceful uses of nuclear energy. It recognises India's commitment and use of nuclear energy with a view to achieving sustainable

development and strengthening energy security. Australia can play the role of a long-term reliable supplier of uranium to India. It provides for supply

of uranium, production of radio isotopes, nuclear safety and other areas of cooperation”....

Apparently, both sides also signed a parallel nuclear safeguards agreement, as India isn't a signatory to the NPT. This was also the case when India had signed a civil nuclear deal with Canada... Besides, it might take four-five years for the shipments to start. According to Australian rules, uranium mining is limited to only a few mines and most are bound by long-terms contracts.

“This deal isn't that much about business; it has more to do with India being recognised as a credible, nuclear-responsible state” ... .

Source: <http://www.business-standard.com>, 06 September 2014.

## **JAPAN-INDIA**

### **Japan and India Report Progress on Nuclear Power Trade Negotiations**

The PM of India and Japan had few breakthroughs to announce on trade in civilian nuclear power technology following a summit on 01 September 2014, but they signaled the countries are moving closer to an agreement. With plans to supply a quarter of its power from reactors by 2050, India represents one of the largest potential markets for Japanese reactor manufacturers like Toshiba, Hitachi and Mitsubishi Heavy Industries. ... Although years of negotiations over measures that would open trade between India and Japan have not yet resulted in an agreement. ... The leaders also discussed a potential cooperative agreement for the peaceful use of nuclear energy. In a joint statement...the PMs called for accelerated negotiations on the agreement and said their countries had made significant progress in talks over the last few months. ...

Source:<https://nuclearstreet.com>,02 September 2014.

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## **KENYA-CHINA-SOUTH KOREA-USA**

### **Kenyan Nuclear Power Planning Moving Forward with Help of South Korea, US, China**

An official in Kenya has confirmed that the country hopes to build a 1,000 megawatt nuclear plant in the next decade and has sent delegations to South Korea, the US and China to explore potential reactor technologies. ...15 Kenyans are taking part in nuclear training programs in South Korea, while six have

been sent to the US and two are in China. ...Geologic studies of potential sites are expected to be complete in three years. The earliest a new plant could come online is 2023, although plans call for 4,000 megawatts of installed nuclear generation by 2031. Kenya does not currently operate any power reactors but has explored civilian nuclear development since at least 2010. According to the WNA, the IAEA reviewed tentative plans for a plant using South Korean technology near Nairobi in 2011.

Source:<https://nuclearstreet.com>,04 September 2014.

## **USA-SOUTH KOREA**

### **S. Korea's Chief Nuclear Envoy Arrives in Washington**

South Korea's top nuclear envoy arrived in Washington on 01 September 2014 for talks with his US counterpart on ways to resume the long-stalled six-party talks aimed at ending North Korea's nuclear weapons program.... “While reviewing the overall situation and sharing assessments with the US side with regard to the nuclear issue and North Korea, I will exchange views on the situation on the Korean Peninsula,”

Hwang told reporters upon arriving in Washington. “There will also be comprehensive discussions on the way forward, such as issues related to resuming

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denuclearization talks, the possibility of additional North Korean provocations and ways to respond to them," he said. ...It also came at a delicate time, when speculation is rising that the US may send a special envoy to the North to win the release of three detained American citizens. South Korean NSA Kwan-jin is also expected to visit Washington to meet with his counterpart, Rice, for talks on the North Korean issue and other pending bilateral affairs.

Source: <http://english.yonhapnews.co.kr>, 09 September 2014.

## NUCLEAR DISARMAMENT

### USA-RUSSIA

#### Obama Inaction on Ukraine could Impede Nuclear Disarmament

The muted American response to Russia's invasions of Ukraine could have consequences far beyond Eastern Europe, according to security analysts who fear the crisis may discourage countries in the future from swearing off nuclear weapons like Kiev did in a 1994 treaty. Three years after the SU's breakup, newly independent Ukraine was compelled by the three nuclear superpowers to enter into the Budapest Memorandum on Security Assurances, a treaty that guaranteed its signatories would respect the "territorial integrity or political independence of Ukraine" and "seek immediate UNSC action" if the country should face an "act of aggression in which nuclear weapons are used."

Although the agreement only requires the signatories take immediate action if Ukraine is threatened with nuclear weapons, foreign policy and Russian experts say US inaction risks signaling to countries like Iran, Pakistan and

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The Budapest Memorandum also promised that its signatories would not place undue economic pressure on Ukraine so that it would not be compelled to surrender its power in exchange for financial aid; the current Moscow-Kiev conflict erupted in March after

the Ukrainian Parliament ousted former President Yanukovich for accepting a \$15 billion bailout from the Kremlin. When the crisis began, the State Department issued a press release in March noting that President Obama had called then-acting Ukraine President Turchynov "to assure him of the strong support of the United States," and also called Mr. Putin to tell him that Moscow was violating the 1994 treaty. Nearly three weeks later, Russia annexed Crimea, and the Kremlin has also struck back with a public relations campaign aimed at the White House.

New Russian military incursions into eastern Ukraine were also reported, raising talk that Moscow might try to create a Russian state in the region. The Russian Foreign Ministry has accused the US and EU of "active connivance" in what it referred to as "the coup d'etat in Kiev, acting against the political independence and sovereignty of Ukraine in violation of their obligations under the Budapest Memorandum."

On 25 August 2014 at the University of Virginia in Charlottesville, Russian Ambassador Kislyak defended the Kremlin to a small group of political science students, arguing that the conflict is between Ukraine and its own people, not Russia and Ukraine.

"The biggest problem in Ukraine is that the government in Kiev, instead of talking to their own people, started bombing. And by bombing, they



create more and more opposition to Kiev," he said....

*S o u r c e : <http://www.washingtontimes.com>, 01 September 2014.*

**NUCLEAR TERRORISM**

**USA-IRAQ**

**US and Iraq Sign a Joint Action Plan to Combat Nuclear and Radioactive Smuggling**

On 02 September 2014, the Governments of the US and Iraq strengthened their bilateral partnership to prevent nuclear terrorism by concluding an agreement to advance protection against nuclear and radiological smuggling. This "Joint Action Plan Between the Government of the Republic of Iraq and the Government of US on Combating Nuclear and Radioactive Materials Smuggling", negotiated by the Department of State's Bureau for ISN and signed by Koplovsky, Minister Counselor of Economic Affairs at US Embassy Baghdad, and Dr. Al-Janabi, Chairman of the Iraqi Radioactive Sources Regulatory Authority, expresses the intention of the two governments to work together to enhance Iraq's capabilities to prevent, detect, and respond to nuclear smuggling incidents.

Following the signing of the Joint Action Plan at the US Embassy in Baghdad, the US Government, via the Department of Energy/National Nuclear Security Administration's GTRI, presented the IRSRA with radiation detection and identification equipment. Specifically, GTRI provided equipment and relevant training to IRSRA to locate, identify, characterize, and recover orphaned or disused radioactive sources in Iraq thereby reducing the risk of terrorists acquiring these

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dangerous materials. The signing and donation of radiation detection equipment reflect the common conviction of the US and Iraqi Governments that nuclear smuggling and nuclear and radiological terrorism are critical and ongoing global threats that require a coordinated, global response.

...  
*Source: <http://www.state.gov>, 03 September 2014.*

**NUCLEAR SAFETY**

**CHINA**

**CAP1400 Preliminary Safety Review Approved**

The Chinese nuclear regulator has approved the preliminary safety analysis report of the CAP1400 reactor design following a 17-month review. Approval of the review was formally announced at a 2 September meeting in Beijing organized by China's NNSA. More than 180 people attended the meeting, including representatives of the environmental protection department of the Nuclear and Radiation Safety Centre, the Beijing Nuclear Safety Evaluation Centre, Suzhou Nuclear Safety Centre, SNPTC and the China Nuclear Power Research Institute. NNSA's safety review for the CAP1400 began in March 2013.... As a result of the review, more than 1000 work orders were drawn up.

**The CAP1400 is an enlarged version of the AP1000 pressurized water reactor developed from the Westinghouse original by SNPTC with consulting input from the Toshiba-owned company. As one of China's 16 strategic projects under its National Science and Technology Development Plan, the CAP1400 is intended to be deployed in large numbers across the country. The reactor design may also be exported.**

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across the country. The reactor design may also be exported. Site preparation is already underway for two demonstration CAP1400 units at Huaneng Group's Shidaowan site in Shandong province. The pouring of first concrete is expected to take place by the end of the year. 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 company. The reactors at Shidaowan will be its first nuclear generation assets.

Source: <http://www.world-nuclear-news.org>, 09 September 2014.

## JAPAN

### Japanese Nuclear Plant Clears Safety Hurdle

A nuclear power plant in southern Japan won regulators' approval 03 September 2014 under new safety standards imposed after the 2011 Fukushima disaster, a key step toward becoming the first to restart under the tighter rules. The NRA unanimously approved an inspection report for the Sendai Nuclear Power Station's two reactors. It concluded that the reactors complied with new regulations designed to avoid major damage during disasters such as the massive earthquake and tsunami that caused meltdowns at the Fukushima Dai-ichi plant. The plant's safety approval and its expected restart are a big boost for Japan's nuclear industry. All of the country's 48 remaining reactors have

**The plant's safety approval and its expected restart are a big boost for Japan's nuclear industry. All of the country's 48 remaining reactors have been offline since the 2011 disaster for safety checks and repairs, except for two that briefly operated under the previous safety standards. The approval of the inspection report followed a 30-day review in which regulators read about 17,000 questions and comments from the public and experts, reflecting the huge public interest in the reactors' safety and possible restart.**

been offline since the 2011 disaster for safety checks and repairs, except for two that briefly operated under the previous safety standards. The approval of the inspection report followed a 30-day review in which regulators read about 17,000 questions and comments from the public and experts, reflecting the huge public interest in the reactors' safety and possible restart.

The authority, however, has no say over a restart of the plant, and it will probably be several months before Sendai's reactors are back online. The plant, which is operated by Kyushu Electric Power Co., still faces an

on-site operational inspection and must obtain the consent of local authorities. Kyushu Electric has upgraded the plant's seismic resistance and is tripling the height of its tsunami seawall to 15 meters (50 feet). It also has evaluated newly added risks including terrorist attacks, airplane strikes and volcanic explosions.

But opponents say the approval is premature because Kyushu Electric can wait two years to implement some key safety measures, such as filters on vents to reduce radiation leaks, and because nearby communities still lack adequate evacuation plans. They worry in particular about the region's volcanic activity since the plant is surrounded by at least five active volcanoes. NRA Commissioner Tanaka said a catastrophic eruption is unlikely before the end of the reactors' functional lifespan in about 30 years. PM Abe has said he will put all reactors deemed safe back online, reversing a nuclear phase-out policy adopted by the previous government. Abe's government has been pushing

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for nuclear plant restarts despite strong public opposition, saying their shutdown hurts Japan's economy.

Source: <http://abcnews.go.com>, 10 September 2014.

**JAPAN**

**Fukushima Daiichi Nuclear Plant Weekly Review**

Debris dropped into a spent fuel pool at unit 3, additional cement for the floor of a manmade harbor, and the likely closure of a reactor elsewhere in Japan were among the headlines related to the damaged reactors at Fukushima Daiichi. Recent developments at the Tokyo Electric Power Co. nuclear plant include: Debris Dropped into Unit 3 SFP. A crane operator attempting to move a jumble of collapsed equipment in the spent fuel pool of unit 3 accidentally dropped a piece of debris to the bottom of the SFP. On August 29, the crane was attempting to lift the console of the unit's fuel handling machine when the 880-pound component fell, coming to rest atop two fuel assemblies. TEPCO said in a release that no elevated levels of radiation were detected nearby, and crews would remotely inspect the fuel and a fuel rack for damage...

On 03 September 2014...TEPCO has begun applying special cement to new areas of the seafloor in the plant's manmade harbor. The material is intended to trap mud with radioactive contamination measured at 167,000 becquerels per kilogram in some places. TEPCO coated areas adjacent to tunnels connected to the damaged reactors in 2012. Additional treatment began in July and the first of two layers is expected to be complete by the end of March. A panel under Japan's NRA has upheld an earlier judgment that an active fault lies under Japan Atomic Power Co.'s

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**NSA will enhance our presence in North America, the world's largest nuclear market, and its safety and security skills will strengthen our international nuclear offering.**

Tsuruga plant. Kyodo news reported 04 September 2014 that the ruling means the utility will have to scrap the unit 2 reactor at the plant.

Source: <https://nuclearstreet.com>, 05 September 2014.

**UK**

**Atkins Completes Acquisition of Nuclear Safety Associates**

The privately-held US nuclear consultancy NSA based in Charlotte, North Carolina has been acquired by UK engineering group Atkins. The 130-employee company, which specializes in US Department of Energy and Nuclear Regulatory Commission work, was established in 2001 and has seven locations in the US. The deal was first announced in May and was subject to regulatory approval, according to NSA. NSA said that a partnership was first formed with Atkins in October 2012 enabled both parties to "clearly identify that we have great alignment on culture, core values and goals." ...

NSA will enhance our presence in North America, the world's largest nuclear market, and its safety and security skills will strengthen our international nuclear offering." ...The combined capabilities provide a comprehensive range of architect-engineer and owner-engineer services offering a unique combination of traditional engineering and design skills with niche specialist nuclear analytical and safety skills"....

Source: <http://www.neimagazine.com>, 08 September 2014.

**NUCLEAR WASTE MANAGEMENT**

**FRANCE**

**French Experts Say Underground Repository the Only Viable Solution for Spent Nuclear Fuel**

South Korea is now trying to decide what to do with its spent nuclear fuel, but French experts here

say there really is only one option not only for South Korea but any country that produces used nuclear fuel — deep underground burial of the highly radioactive material. France's search for ways to safely manage spent nuclear fuel began in 1991, when it launched research on three methods of nuclear waste disposal, according to Guillemenet, a spokeswoman for the Meuse Haute-Marne Center of France's National Radioactive Waste Management Agency (ANDRA)....

**The possibilities included geological disposal and neutralization of toxic nuclides via separation and transformation as permanent ways to dispose of nuclear waste. The third proposed method was interim storage of high-level radioactive waste.**

The possibilities included geological disposal and neutralization of toxic nuclides via separation and transformation as permanent ways to dispose of nuclear waste. The third proposed method was interim storage of high-level radioactive waste. Guillemenet said that at least for France, 15 years of research has proven that geological disposal was the best solution. Separate research has shown that neutralization of nuclides cannot be applied to all radioactive materials and that an interim repository simply could not be a permanent solution. She said that most of the other countries that use nuclear power, including the United States, have reached a similar conclusion.

**The urgency for a permanent solution for spent nuclear fuel can also be seen in the fact that South Korea's interim storage pools are fast running out of room, with some of them expected to reach their full capacity in 2016.... South Korea operates 23 nuclear reactors, the world's fifth-largest number, that generate about 30 percent of the country's overall electricity demand, along with 750 tons of spent nuclear fuel per year.**

South Korea is now going through what France did more than 20 years earlier — trying to decide how to dispose of its nuclear spent fuel - but a public debate led by PECOS is facing stiff public controversy. It is accused of having set its policies and feigning a public debate only as a formality. Nuclear experts say the controversy is inevitable because all states that use nuclear energy must, sooner or later, find ways

to permanently dispose of their spent nuclear fuel, and there is really only one viable solution. They estimate that it will take up to 300,000 years for the radiation level of spent nuclear fuel to be reduced to that of natural uranium, meaning that such nuclear waste must be isolated from residents for the duration. "It has been over 30 years since South Korea began operating nuclear reactors, but it has yet to have any policy on spent nuclear fuel," Seong-kyung, a spokeswoman for the PECOS, said in her talks with reporters at the ANDRA research center in Bure, also the proposed site of what will be France's first deep underground repository.

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Source: <http://english.yonhapnews.co.kr>, 03 September 2014.



**FRANCE–SOUTH KOREA**

**France Provides Possible Answers as S. Korea Considers Reprocessing Spent Nuclear Fuel**

As South Korea cautiously considers nuclear reprocessing as an option in dealing with its waste from reactors, the experience of France suggests that it should make the choice, but for safety and environmental reasons rather than political arguments related to fears of nuclear proliferation. Under a nuclear accord with the US signed in 1973, South Korea is prohibited from reprocessing spent nuclear fuel or enriching uranium to produce nuclear fuel without consent from Washington. Used nuclear fuel contains plutonium, and reprocessing spent fuel may give access to the material for nuclear weapons. Despite growing voices in South Korea for the accord to be revised, negotiations for the purpose have hardly made progress as Washington worries that such a move by Seoul would give Pyongyang an excuse to continue its nuclear arms development program. North Korea has already conducted three nuclear detonations since October 2006.

For officials from the Paris-based AREVA, the world's largest nuclear company, the answer was more clear. "Recycling is a choice for sustainable management of energy resources," said Charbonnier, deputy director of AREVA's reprocessing facility in La Hague, Normandy, on 27 August 2014. Since its opening in 1966, the La Hague facility,

**Under a nuclear accord with the US signed in 1973, South Korea is prohibited from reprocessing spent nuclear fuel or enriching uranium to produce nuclear fuel without consent from Washington. Used nuclear fuel contains plutonium, and reprocessing spent fuel may give access to the material for nuclear weapons.**

**Since its opening in 1966, the La Hague facility, the largest of its kind in the world, has reprocessed over 30,000 tons of spent nuclear fuel, about 75 percent of the total recycled in the world.**

**The reason why France chose reprocessing is because in terms of saving energy, recycling 96 percent of the content of used nuclear fuel can help save natural uranium while it also helps take care of managing the final waste by reducing the volume of the final waste and allowing safe storage of such materials**

the largest of its kind in the world, has reprocessed over 30,000 tons of spent nuclear fuel, about 75 percent of the total recycled in the world. According to the AREVA official, about 96 percent of the content of spent nuclear fuel can be recycled to produce enriched, recycled uranium fuel and MOX fuel, leaving only a small amount of waste. As the result of recycling, according to Charbonnier, the volume of the final waste is reduced to one fifth of the original volume of spent nuclear fuel.

In addition, because the reprocessing process takes out plutonium, the most toxic material in spent nuclear fuel, to produce MOX fuel, the toxicity of the final waste is also reduced to about one tenth of the original spent fuel, he said. South Korea's energy officials say it takes about 300,000 years for the toxicity of plutonium to drop to the same level of natural uranium. However, once plutonium and the final waste are removed from spent nuclear fuel through reprocessing, it takes only about 300 years to reach the safe level.

"The reason why France chose reprocessing is because in terms of saving energy, recycling 96 percent of the content of used nuclear fuel can help save natural uranium while it also helps take care of managing the final waste by reducing the volume of the final waste and allowing safe storage of such materials," Jourdain, an AREVA official in La Hague, told reporters. Since August 2008, South Korea and the US have held 10 rounds of negotiations

to amend their nuclear accord, originally set to expire in March. The nuclear accord has been extended by two years. South Korea, now in the early stage of a public discussion on how it will manage its spent nuclear fuel, is seeking to be able to use the "simple and well-known technology" of reprocessing used nuclear fuel. ...

Source: <http://english.yonhapnews.co.kr/business>, 03 September 2014.

## USA

### Feds Want Nuclear Waste Train, but Nowhere to Go

The US government is looking for trains to haul radioactive waste from nuclear power plants to disposal sites.... The US Department of Energy recently asked companies for ideas on how the government should get the rail cars needed to haul 150-ton casks filled with used, radioactive nuclear fuel. They won't be moving anytime soon. The latest government plans call for having an interim test storage site in 2021 and a long-term geologic depository in 2048....

The US Nuclear Regulatory Commission and Department of Transportation share responsibility for regulating shipments.... In a public solicitation, the Energy Department asked for opinions on whether it should buy or lease the rail cars. It expects the cars could last 30 years, run at standard speeds on regular tracks, accommodate the heavy protective casks and be used up to eight times annually. Besides a car to carry the cask, the trains would have buffer cars to maintain a safe distance between the crew and the radioactive cargo.

The US military already sends fuel by rail from its reactors on Navy ships to federal labs for storage. The civilian power industry hauled more than 2,300 tons by rail from 1979 to 2007,

averaging just over nine trips annually, according to NRC data. Nuclear fuel is extremely hot and radioactive when it is removed from a reactor. Utilities first cool spent fuel in a water-filled pool, then can transfer it to massive casks that sit on land. Neither option is supposed to be final. One of the biggest rail shippers was Progress Energy, which moved spent fuel from two of its plants to a third plant, Shearon Harris in North Carolina, because it had spare room in its spent fuel pool. The rail shipments prompted protests and appeals from environmental groups and local governments, and the company announced in 2003 it would halt those shipments after building land-based storage facilities at its other plants, eliminating the need for the transfers.

...The tracks were supposed to lead to a depository at Yucca Mountain in Nevada, where Congress intended to send radioactive fuel. Instead, the Obama administration cancelled a project that had been criticized as inadequate and opposed by many Nevadans. By law, the federal government is responsible for nuclear fuel disposal and once charged electric customers to fund its work. After a lawsuit, the Energy Department quit collecting that fee this 2014. ...Federal timelines would put off many big decisions about a permanent resting place for

the waste until long after Obama leaves office. Industry officials are praising even limited signs of forward movement, including federal interest in a train....

Source: <http://abcnews.go.com>, 31 September 2014.

### Hearings Begin on Nuclear Waste Burial Plot in Kincardine

Additional public hearings into Ontario Power Generation's proposal to bury nuclear waste a kilometre from Lake Huron in Kincardine get

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underway on 09 September 2014. The Joint Review Panel hearing will look at the methodology used to determine adverse environmental effects. Expansion plans, revisions to the waste inventory, and updates to the geoscientific verification plan are also on the agenda. The hearings will take place at the Kincardine Legion... If approved, the proposed underground storage facility

**If approved, the proposed underground storage facility will be built and operated by Ontario Power Generation to store radioactive materials used in routine clean up or maintenance, and used nuclear reactor components. There has been extensive opposition to the plan because of concerns about contaminating the water supply of millions of residents.**

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*Source: <http://blackburnnews.com>, 09 September 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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