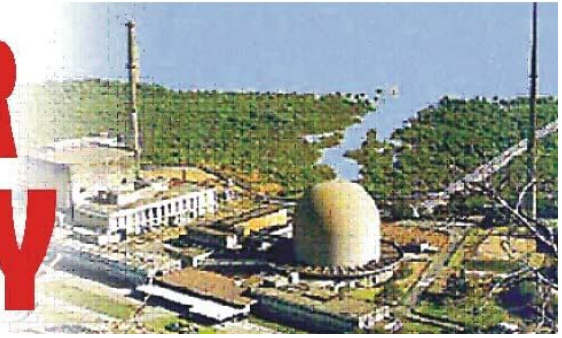


# NUCLEAR SECURITY



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

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## OPINION – Jaideep Prabhu

### Why Allowing China into India's Nuclear Energy Market would be Unwise

During his recently concluded visit to India, Xi Jinping expressed China's interest in participating in India's nuclear energy market. The sector is expected to be worth at least \$150 billion and India's small domestic nuclear energy capacity cannot handle the rapid ramp up in the country's energy crisis demands. Foreign vendors have been in discussions with Delhi since the India-US nuclear agreement but have so far been vexed by India's unconventional nuclear liability law. Presently, India is looking to source 40 light water reactors from Rosatom, Westinghouse, General Electric, and Areva; Beijing hopes that its three nuclear developers – China General Nuclear Corporation, China National Nuclear Corporation, and China Power Investment Corporation will receive a piece of India's nuclear pie in the next round.

While China's nuclear dream is very impressive and tempting, there are several considerations India must keep in mind. The foremost among these is the vendor's nuclear safety and regulatory history. At a quick glance, China's nuclear industry appears just as competent and competitive as any other in the world. China has not had a single nuclear accident scored above 2 on the International Nuclear Events Scale and the country has been constantly improving its standards since its first civilian nuclear reactor

**The Chinese reactors have had some problems which the Chinese have been reticent to admit: in 1998, for example, one of the reactors at Qinshan suffered a critical failure and had to be rebuilt because of defects in the welding of the steel vessel that contained the reactor. Worse, these reactors will be operating on technology a century old by the time they are decommissioned.**

went online. After the earthquake-tsunami in Fukushima in Japan, Beijing ordered a full review of its safety precautions to ensure – and reassure – that its reactors were not similarly vulnerable.

However, China's nuclear establishment is not known for its transparency and concerns have been voiced at regular intervals. Presently, China has 20 nuclear power plants operating and another 28 are being constructed. Of these, most will have the CPR-1000 reactor, the Chinese version of the French 900 MW M310 unit. The Chinese reactors have had some problems which the Chinese have been reticent

## CONTENTS

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

to admit: in 1998, for example, one of the reactors at Qinshan suffered a critical failure and had to be rebuilt because of defects in the welding of the steel vessel that contained the reactor. Worse, these reactors will be operating on technology a century old by the time they are decommissioned.

There is great concern over the process by which China buys or builds its reactors. As one US embassy cable complained, "all reactor purchases to date have been largely the result of internal high level political decisions absent any open process." To be fair, the US might be exaggerating the seriousness of the matter to promote its own reactors instead, but such concern has also been voiced within China. He Zuoxiu, a Chinese scientist involved in developing the country's first nuclear device, has warned against the rapid expansion of nuclear facilities without the congruent expansion of intellectual infrastructure to license, construct and operate the additional reactors. Fan Bi, a senior official at China's State Council Research Office, agrees. In an article that appeared only a few months before the Fukushima accident, Fan wrote, "If the current momentum of development continues, if too many nuclear power projects are started too quickly, it could jeopardize the healthy, long-term development of nuclear power.... Safety is the lifeline of the nuclear power industry." Others would add transparency of safety and regulatory mechanisms to that list.

Areva, which is involved in constructing two of its latest 1,650 MW EPRs at Taishan, has expressed its concerns over the project. "It's not always easy to know what is happening at the Taishan site," said one official. The collaboration was not at a level that the French firm desired, admitted another official, explaining, "One of the explanations for the difficulties in our relations is that the Chinese safety authorities lack means. They are overwhelmed." *Autorite de Surete*

*Nucleaire*, the French nuclear regulatory authority, has given few details about its worries in China. However, the body has published hundreds of documents and closely monitored the work at Olkiluoto, Finland, with whom they have better relations.

Yet another concern is the quality of indigenously manufactured reactor components. One former vice president of CNNC confessed that though Beijing puts great emphasis on nuclear safety, "companies executing projects do not seem to have the same level of understanding." This is encouraged by the cosy relationship between China's state-owned nuclear regulators and state-owned operators, as well as by a revolving door that allows employees to move easily between government and industry. The formulation of cogent policy is even more challenging due to divided responsibility for the country's nuclear governance between multiple government departments and bureaucracies. China's quest for rapid growth only exacerbates these problems of weak regulation, poor implementation, and faulty manufacturing. Given India's own questionable policies on nuclear transparency and accountability, it would be natural for Chinese firms to replicate their behaviour at home in India as well.

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To be fair to China's nuclear industry, it has also shown remarkable eagerness to achieve the world's highest standards in safety. It has voluntarily been through a dozen of the IAEA's OSART missions and subjects all its civilian nuclear facilities to annual inspections by the World Association of Nuclear Operators. Though the details of the reports are private, they confirm that the reactors are operated in conformance with international protocols and standards.

Nonetheless, these accolades are for reactor operation, not construction. China's suitability as a nuclear partner is in doubt when its export

potential is stretched to the limit by its domestic expansion plans – China hopes to add 250 GW of nuclear power between now and 2040, bringing 10 reactors online every year. China's three nuclear enterprises will be hard-pressed to construct and provide post-completion support to their international clients.

For domestic nuclear enthusiasts, one hope is that between international inspections, peer reviews, and collaboration with international entities with a good safety culture, India's nuclear enclave will also develop greater transparency and accountability. India has never had a nuclear accident rated above 3 on the INES and though an IAEA inspection gave Rajasthan's nuclear power units a good evaluation, fears abound due to ignorance of the general populace and poor communication by the authorities. The lack of independence of India's nuclear regulatory authority is also of some concern. Given China's record on transparency, these values will hardly be inculcated in the Indian establishment via a nuclear partnership with Beijing.

China is a below-par partner on another level too – technology transfer. India has always made the transfer of technology a key component of its high-tech purchases, hoping these would compensate for its own inadequacies in research & development. However, Beijing has little new technology to offer; nuclear energy took off in China only in the late 1980s and Beijing also bases its nuclear decisions on the degree of technology transfers vendors are willing to provide. Like India, China also intends to leapfrog stages of nuclear development via reverse engineering and emerge, initially under license, as a major exporter of nuclear products and services. India would be better served by dealing directly with more mature vendors in France, Canada, Russia, and the US.

Unlike other sectors, nuclear partnerships are long-term relationships. The life of an average

reactor nowadays is 40-60 years and during that time, the vendor is always in the picture. Many reactor contracts nowadays come with a lifetime guarantee of nuclear fuel and support as well and it is not easy to change suppliers as Ukraine recently discovered. Is India willing to enter into a 60-year marriage with a country that denies Indian firms fair market access, props up a neighbouring state with nuclear weapons and missiles against India, has claims on Indian territory, and with whom regular skirmishes along the border are not unusual?

China's interest in India's nuclear programme is, to put it politely, curious. Beijing has consistently vetoed Delhi's application to join the NSG and yet it wishes to enter India's nuclear market. China may have calculated its policy based on India's nuclear liability law – as it exists, the law inhibits private foreign vendors such as Westinghouse or GE from competing in the Indian market by imposing new and large insurance premia. The state-owned enterprises of Russia and China, however, will find it easier to provide for the necessary guarantees. If

India sticks to its present nuclear liability law, the smaller number of vendors in India's nuclear bazaar is to China's advantage. A normative nuclear liability law, however, negates that advantage and leaves China with little to offer.

India must insist on any nuclear cooperation with China to be contingent upon Beijing's unconditional support to India's membership to the NSG; China is presently trying to finagle a place for its ally Pakistan along with India in the body and such hyphenation runs contrary to Delhi's long-stated position. An uncompromising attitude on the NSG costs India little for China has no nuclear unique selling point. The policy of barring India's entry into the NSG while hoping to enter its nuclear market run contrary to each other.

India's nuclear establishment has borne the price of four decades in the non-proliferation

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wilderness. Consequently, it remains in a diminished capacity and sorely needs an infusion of capital and talent. However, China is an unsuitable partner for India in a venture as complex and as strategic as nuclear energy for technical as well as geopolitical reasons. As with telecommunications, it would not be judicious for India to allow China into its nuclear energy market.

Source: <http://www.dnaindia.com>, 23 September 2014.

**India's nuclear establishment has borne the price of four decades in the non-proliferation wilderness. Consequently, it remains in a diminished capacity and sorely needs an infusion of capital and talent. However, China is an unsuitable partner for India in a venture as complex and as strategic as nuclear energy for technical as well as geopolitical reasons.**

**OPINION – Mahim Pratap Singh & Alok Deshpande**

**From Nuclear Diplomacy to Energy Self-sufficiency?**

For a sector that contributes less than 3% to India's current energy needs, the promise of nuclear cooperation from Australia and China has come as a beacon of hope for reviving its prospects. Within months of assuming office, PM Narendra Modi ratified the additional protocol of the IAEA, inked a civilian nuclear deal with his Australian counterpart Tony Abbott and convinced Japanese PM Shinzo Abe to speed up Tokyo's nuclear cooperation process with New Delhi. Even China, which has stayed away from 'talking nuke' with India for the longest time, agreed to bilateral civil nuclear cooperation with New Delhi during President Xi Jinping's recently concluded visit. This has bolstered Mr. Modi's prospects for Chinese backing of India's NSG membership.

India's nuclear vision, which envisages about 63000 MW of installed nuclear power capacity by 2032, essentially has two goals – access to uranium and access to technology. Former

**The main problem now is with liability laws and that too largely with US companies," according to government sources. "Russian companies are largely state-owned...if there's a fear the state could assuage those concerns...but US companies are not state-owned...so we're finding it a little bit more difficult...the problem with the French is the cost.**

chairman of the AEC and noted nuclear scientist Anil Kakodkar said that import of high grade uranium from Australia is required for the growth of nuclear power sector in India. According to the AEC, of the 20 commercially operating Indian nuclear power reactors, 10 are currently under IAEA safeguards and two more will come under safeguards by December 2014. The IAEA-safeguarded reactors are eligible to be fuelled by imported uranium. With

agreements to buy uranium from countries like Russia, Canada, Namibia, Mongolia, and Kazakhstan among others, India has successfully diversified its energy sources. With reactor deals with Russia (1000 MW at Kudankulam), France (Areva/1600 MW at Jaitapur) and the US (about 1000 MW in Gujarat/Andhra Pradesh), India has managed to get access to three different streams of technology with different capacities. While this is undoubtedly beneficial to Indian interests, it also means a longer time period for technology absorption.

"The main problem now is with liability laws and that too largely with US companies," according to government sources. "Russian companies are largely state-owned...if there's a fear the state could assuage those concerns...but US companies are not state-owned...so we're finding it a little bit more difficult...the problem with the French is the cost," the sources said. While global nuclear legislative practices channel the liability

exclusively towards the operator, Indian Nuclear Liability Law 2010 brought in supplier liability too.

Arguments, thence, have been made for quantifying the suppliers' liability instead of keeping it open-ended. "US companies feel if there is an accident, liability could have a bearing

on corporates in the nuclear power sector. But there is a slim chance of India diluting its position (on supplier liability)," said the sources.

*A Troubled Project:* Though promise of fuel imports for the nuclear industry has boosted hopes, the example of the Rs. 17,000-crore KNPP reveals the limitations of nuclear diplomacy for energy security. Conceived way back in late eighties, the project that symbolised Indo-Russian cooperation in civilian nuclear energy, had a bumpy ride. Though the Rajiv-Mikhail Gorbachev agreement was signed in 1988, for constructing two pressurised light water nuclear reactors, each with the capacity of 1,000 MWe at Kudankulam, the 'first pouring of concrete' for this project happened only in 2002. And, the gestation period for the construction of this nuclear reactor, which is otherwise just five years, extended beyond 12 years. A range of reasons contributed to this – delayed supply of the components, installation, incorporation of additional third generation safety features and anti-nuke agitation, escalating the expenditure from Rs. 13,171 crore to over Rs. 17,000 crore. The reactor is set for commercial generation in a couple of weeks.

Meanwhile, the People's Movement against Nuclear Energy, an anti-nuclear power movement based in Idinthakarai, has vowed to stall the move to construct four more reactors while demanding comprehensive investigation about the first two reactors. "Besides scrapping the KKNPP completely in the best interest of the people living in Southern Tamil Nadu and neighbouring Kerala, the public opinion on the country's nuclear policy should be elicited through a nationwide debate," says S.P. Udayakumar of PMANE.

*Undeterred:* The challenges faced by the nuclear industry, however, will not deter Modi's pursuit of nuclear diplomacy. In a closed-door interaction

with scientists at the BARC in July, the PM asked them to keep up to the target of tripling nuclear power generation by 2023. Power Minister Piyush Goyal, however, intends to tread cautiously on the nuclear energy path. "Everything depends on the costs and assurances that dependence on nuclear energy would not come at the cost of India's sovereign interests," he said.

*Source: <http://www.thehindu.com>, 21 September 2014.*

#### **OPINION – Clint Richards**

#### **Japan's Nuclear Power Quagmire**

The Japanese government is once again issuing public statements in an attempt to convince a highly skeptical public of the necessity of restarting the country's nuclear reactors, at least in part, with Prime Minister Shinzo Abe's government taking two approaches. The first came from Abe himself, who while speaking on the sidelines of the UN General Assembly in New York, said Japan's reactors would not be brought back online "unless safety is restored 100 percent," according to Reuters. While he did not specify how such certainty could be attained, his government has spent considerable energy to place its own commissioners on the Nuclear Regulatory Authority's board, in an attempt to better facilitate the restart process.

**While Abe has sought to assure the public that nuclear energy will be responsibly reinstated, his Cabinet's new Minister of Economy, Trade and Industry, Yuko Obuchi, has been tasked with convincing the Japanese people that the country cannot sustain an energy sector without a substantial nuclear component, as its energy security is now almost completely dependent on imports.**

While Abe has sought to assure the public that nuclear energy will be responsibly reinstated, his Cabinet's new Minister of Economy, Trade and Industry, Yuko Obuchi, has been tasked with convincing the Japanese people that the country cannot sustain an energy sector without a substantial nuclear component, as its energy security is now almost completely dependent on imports. She told public broadcaster NHK that "It would be very difficult to make the decision not to have nuclear power right now." She said Japan's

fossil fuel imports have increased by 3.6 trillion yen (\$33 billion), or “10 billion yen a day.” She also said that, despite substantial investment, renewable energy was not proving reliable enough to offset fossil fuels, which are increasing carbon emissions.

As if to underscore her last comment, Japan’s Kyushu Electric Power Co said it would no longer grant access for renewable energy suppliers to its grid. Kyushu Electric, now the third of Japan’s 10 major utilities to deny renewable access, says that renewables are not a reliable energy source, which means they could threaten grid stability and cause blackouts if they become a major energy component. This is despite Japan’s push to subsidize renewable energy that has mostly gone to solar, which now has 68 gigawatts of capacity, double the amount Germany has, yet Reuters reports that only 9.8 gigawatts has been connected to the country’s grids.

Major utility companies are still pushing to invest in and restart their nuclear reactors. The Jiji Press reported that Tohoku Electric Power Co is planning to invest 300 billion yen to improve safety at its Onagawa and Higashidori nuclear power plants. Meanwhile, Eric Johnston at the *Japan Times* reported that some Diet members and even Cabinet officials are still urging the government to further study and invest in underground nuclear reactors. Johnston concedes that the idea appears ludicrous at face value, as well as highly unlikely to gain support from the majority of Japanese people still deeply distrustful of nuclear energy. However, he notes that several institutions including the OECD, the US Energy Department, and even Bill Gates support the use of small, underground reactors that produce fractional amounts of electricity at a much lower cost.

Source: <http://thediplomat.com>, 26 September 2014.

**OPINION – Taj Hashmi**

**America’s Ramped Up Nuclear Capability: Prelude to Another Cold War?**

While people across the world for the last three years have been watching the unbelievable resurgence in state and non-state-actor-sponsored violence and terror across the Arab World – Libya, Egypt, Syria, Gaza, and of late, Iraq – the Obama administration’s recent decision to ramp up its nuclear capability has almost remained unnoticed to most analysts, let alone the common people. Even if, very similar to what happened during the Cold War, America’s ramped up nuclear capability does not lead to a nuclear conflagration, it is going to signal further nuclear proliferation, arms race and a new cold war.

Some American analysts find it unbelievable, that “a president who campaigned for ‘a nuclear-free-world’ and made disarmament a main goal of American defense policy,” has thumbed-up a massive revitalisation for new generation of nuclear warheads and weapon carriers. The price tag is estimated to be a trillion dollars over the next 30 years. The justifications for the “modernisation of nuclear capabilities” – apparently not synonymous with increasing nuclear warheads – are baffling.

While Russia is alleged to be on the march; China is assumed to be pressing further its territorial claims to the detriment of its neighbours; and Pakistan is “expanding” its arsenal. Gary Samore, Obama’s nuclear adviser in his first term, has singled out Putin’s “invasion of Ukraine” as “the most fundamental game changer” in regard to America’s ramping up its nuclear capability. One assumes, thanks to the growing influence of the hawks in Washington, soon Iran’s purported nuclear capability will further rationalise America’s nuclear modernisation programme.

As a *New York Times* editorial (Sept 24, 2014) has pointed out, during the past six years Obama promised to make the world eventually nuclear arms free. And that his promises have substantially de-escalated the arms race: 13 countries so far have completely eliminated their nuclear materials, and 15 have destroyed portions of their stockpiles. Nevertheless, there are about 2,000 nuclear weapons located in 14 countries,

and 25 countries have the materials and technology to build their own bombs.

What is apparently baffling is Obama's raising the nuclear modernisation budget from \$70 to \$84 billion a year. Interestingly, having no qualms with spending a trillion dollars to build a dozen nuclear submarines, 100 new bombers and 400 land-based missiles, and spending billions on weapon upgrades, the Congress hardly debated the issue.

As we know, in accordance with the "Weinberger Doctrine" (he was Reagan's defence secretary), America does not want to commit the Vietnam mistakes. Now, it favours using overwhelming force for a swift and decisive victory, as it achieved in Iraq in 1991 and 2003. In 2011, America spent \$739.3 billion on defence, equivalent to more than 45% of what the rest of the world spent on defence that year. Obama's latest volte-face indicates two things: (a) either he has started believing in American hawks who love to see their country as an empire, which should be on the path to "permanent war;" or (b) he is too vulnerable to the overpowering influence of the Military-Industrial Complex (MIC) on the Congress.

We have reasons not to blame Obama for his "ambivalence" towards arms race and nuclear escalation. The Nobel Laureate in Peace is anything but the "most powerful man in the world." He cannot overpower the hawks and the MIC, who, as one analyst believes, want at least one major war every ten years in some distant part of the world. The hawks are good at generating fear among the bulk of Americans

**13 countries so far have completely eliminated their nuclear materials, and 15 have destroyed portions of their stockpiles. Nevertheless, there are about 2,000 nuclear weapons located in 14 countries, and 25 countries have the materials and technology to build their own bombs.**

**We believe the nuclear option is not for containing Russia, China or Iran. It is all about the "profits of war." Another cold war or "cold peace" may lead to further arms race, even nuclear proliferation. Nevertheless, America and its Western allies would remain dominant militarily in the foreseeable future.**

about the unknown or least known enemies, such as the ISIS and the Khorasan Group in Iraq and Syria.

In view of Obama's latest "backsliding on nuclear promises," one may argue as to why his administration and the beneficiaries of the "permanent war" should spend another trillion dollars in the next three decades on nuclear modernisation while America has slowly and steadily entered into the arena of another long war in the Middle East against the ISIS, who seem to have appeared from nowhere, and despite meager resources and manpower, captured substantial territories in Syria and Iraq. As America's latest war is being planned – albeit with tepid support from five Arab autocracies, one of them (Saudi Arabia) also regularly beheads people in the name of Islam and Shariah like the ISIS extremists – it should make

the hawks and MIC happy. So, why should the Obama administration go for the nuclear modernisation? We believe the nuclear option is not for containing Russia, China or Iran. It is all about the "profits of war." Another cold war or "cold peace" may lead to further arms race, even nuclear proliferation. Nevertheless, America and its

Western allies would remain dominant militarily in the foreseeable future. It seems, America's latest military adventure in the Arab World gives credence to what General Wesley Clark said about the Pentagon's long-term plan to invade several countries in the region, including Iraq, Syria and Iran, without any specific reasons but – as one would guess – for the benefit of the MIC alone.

Similarly, one may argue that investing a trillion dollars on nuclear modernisation would further benefit those who benefit from conventional wars

as well. Conversely, one is not sure if the nuclear modernisation in the long run might be more profitable (for the MIC) than waging unpopular wars against Syria and Iran! However, America's ramping up the nuclear capability is likely to end the so-called unipolarity; and might usher in another cold war and "cold peace," hurting food supply, human rights, democracy and development across the world, especially in the Third World. Last but not least, nuclear modernisation would eventually lead to nuclear proliferation. And there is no guarantee that terrorists and terrorist-states would not have access to nuclear technology.

Source: <http://www.thedailystar.net>, 27 September 2014.

## NUCLEAR STRATEGY

### PAKISTAN

#### **Pakistan is Eyeing Sea-based and Short-range Nuclear Weapons, Analysts Say**

In one of the world's most volatile regions, Pakistan is advancing toward a sea-based missile capability and expanding its interest in tactical nuclear warheads, according to Pakistani and Western analysts. The development of nuclear missiles that could be fired from a ship or submarine would give Pakistan "second-strike" capability if a catastrophic nuclear exchange destroyed all land-based weapons. But the acceleration of Pakistan's nuclear and missile programs is renewing international concern about the vulnerability of those weapons in a country that is home to more than two dozen Islamist extremist groups.

... Western officials have been concerned about Pakistan's nuclear program since it first tested an atomic device in 1998. Those fears have deepened over the past decade amid political tumult, terrorist attacks and tensions with the country's nuclear-armed neighbor, India, with which it has fought three wars. That instability was underscored this month as anti-government protests in the capital appeared to push Prime Minister Nawaz Sharif's government to the brink of collapse. The political

crisis was unfolding as Pakistan and India continued lobbing artillery shells across their border, in a tit-for-tat escalation that illustrated the continued risk of another war.

For more than a decade, Pakistan has sent signals that it is attempting to bolster its nuclear arsenal with "tactical" weapons — short-range missiles that carry a smaller warhead and are easier to transport. Over the past two years, Pakistan has conducted at least eight tests of various land-based ballistic or cruise missiles that it says are capable of delivering nuclear warheads. Last September, Sha-rif, citing "evolving security dynamics in South Asia," said Pakistan is developing "a full-spectrum deterrence capability to deter all forms of aggression."

The next step of Pakistan's strategy includes an effort to develop nuclear warheads suitable for deployment from the Indian Ocean, either from warships or from one of the country's five diesel-powered submarines, analysts say. In a sign of that ambition, Pakistan in 2012 created the Naval Strategic Force command, which is similar to the commands in the air force and army that oversee nuclear weapons. "We are on our way, and my own hunch is within a year or so, we should be developing our second-strike capability," said Shireen M. Mazari, a nuclear expert and the former director of the Institute of Strategic Studies Islamabad, a hawkish Pakistani-government-funded think tank.

Pakistan's nuclear push comes amid heightened tension with US intelligence and congressional officials over the security of the country's nuclear weapons and materials. The Washington Post reported in September 2013 that US intelligence officials had increased surveillance of Pakistan in part because of concerns that nuclear materials could fall into the hands of terrorists.

... During a visit to Washington for consultations with the Obama administration in July, Tariq Fatemi, Sharif's senior foreign policy adviser, said the government had "no intention of pursuing" sea-based nuclear weapons. It is unclear how much direct knowledge Sharif's government has about the country's nuclear weapons and missile-



development programs, which are controlled by the powerful military's Strategic Planning Directorate. But the prime minister is the chairman of the country's National Command Authority, a group of civilian and military officials who would decide whether to launch a nuclear weapon.

Pakistani military officials declined to comment on the nuclear program. They note, however, that a January report by the Washington-based Nuclear Threat Initiative named Pakistan the "most improved" in safeguarding nuclear materials. Analysts say much about Pakistan's program remains a mystery. Western experts, for example, are divided over whether Pakistan has the ability to shrink warheads enough for use with tactical or sea-launched weapons. "They may have done so, but I can't imagine it's very reliable," said Jeffrey Lewis, a nuclear and nonproliferation scholar at the Monterey Institute of International Studies. Still, Lewis and other analysts say Pakistan is without doubt embarking on an ambitious multi-year strategy to enhance its nuclear arsenal and delivery systems.

In 2011, nongovernment experts interviewed by *The Post* estimated that Pakistan had built more than 100 deployed nuclear weapons. Now Pakistan's fourth plutonium-production reactor is also nearing completion, and while most assessments of the country's warhead inventory have not changed much in recent years, analysts say Pakistan continues to produce weapons material and develop delivery vehicles, positioning itself for another spurt of rapid growth at any time. "They are going to make as much fissile material as they possibly can and keep making as many warheads as they possibly can," said Pervez Hoodbhoy, a leading Pakistani nuclear expert and physicist.

India, which experts estimate has 80 to 100 deployed nuclear weapons, has a stated policy of using them only in response to an attack. Pakistan has repeatedly declined to embrace a no-first-use

policy. But concerns within Pakistan about India's growing nuclear ambitions are helping to fuel Pakistan's own advancements.

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... So instead of working to enhance the range of its missiles, Pakistan is developing shorter-range cruise missiles that fly lower to the ground and can evade ballistic missile defenses, analysts say. Pakistan has repeatedly tested its indigenously produced, nuclear-capable Babur cruise missile, which has a range of 400 miles and can strike targets at land and sea, military officials said. In 2011 and last year, Pakistan also tested a new tactical, nuclear-capable battlefield missile that has a range of just 37 miles.

*Source: Excerpted from article by Tim Craig and Karen DeYoung. <http://www.washingtonpost.com>, 21 September 2014.*

## **UKRAINE**

### **Ukraine's Threat to Go Nuclear is 'Hot Air'**

It would take years, hundreds of millions of dollars and a willingness to become a global outcast for Ukraine to enact the possibility voiced 14 September by its defense minister of becoming a nuclear power again, military and political analysts said on 15 September. "If today we cannot defend [Ukraine], if the world will not help us, we will be forced to return to creating this weapon, which will defend us against Russia," Valery Gelety told reporters at a news conference in Kiev. Gelety clarified, however, that changing Ukraine's nuclear status is not on the agenda right now. Dmitry Rogozin, Russia's outspoken deputy PM in charge of the state armaments program, reacted to the suggestion with sarcasm.

"I've heard the one about a monkey and a hand grenade. But this is the first time I've heard of a monkey dreaming about a nuclear one," Rogozin wrote on Twitter. But is Ukraine's nuclear ambition even remotely realistic?

*Diplomatic Cost:* When Ukraine became independent in 1991 following the collapse of the

Soviet Union, it found itself in possession of the third-largest nuclear stockpile in the world. By June 1996, it had transferred all its nuclear warheads to Russia and acceded to the Treaty on the NPT as a non-nuclear state. Ukraine's accession to the treaty was contingent on security and territorial integrity guarantees given to it by Russia, the US and Britain when they signed the Budapest Memorandum in 1994. Russia's annexation of Crimea in March rendered the Budapest Memorandum null and void, and therefore Ukraine can also relinquish its obligations under the NPT treaty, several Ukrainian parliament deputies argued at the time. One Verkhovna Rada lawmaker, Sergei Kaplin, claimed that the state could produce a nuclear weapon in two years at a cost of \$3.4 billion.

A state can withdraw from the NPT at three months' notice in the event that "extraordinary events, related to the subject matter of this treaty, have jeopardized the supreme interests of its country." So far the only country that has followed this path is North Korea. India, Pakistan, South Sudan and Israel are non-signatory states. "If Ukraine makes such a decision, it will essentially mean that its current political allies – the US, European Union and others – will have to abandon Kiev," Pyotr Topychkanov, coordinator of the Carnegie Moscow Center's nonproliferation program, told The Moscow Times. "Nobody will support Ukraine, not Europe or China. In practice it will be considered a rogue state, just like North Korea," Topychkanov said in a phone interview.

*Technical Hitches:* Even if Ukraine went ahead and attempted to develop its own nuclear weapon, it would take years, if not decades, and would deplete the country's already scarce resources, analysts said. "Ukraine's economic standing today is such that it will be close to impossible to create a nuclear bomb," Colonel General Viktor Yesin, former chief of staff of the Russian Strategic

Rocket Forces, told The Moscow Times. Ukraine currently makes Dnepr intercontinental ballistic missiles – including for Russia – at its Yuzhmash plant in Dnipropetrovsk. It also has reserves of uranium and missile silos. It could use its 15 nuclear reactors, most of them Soviet-built, to enrich uranium, instead of using centrifuges like Iran.

It would cost up to \$500 million to do, according to nuclear analysts. The most difficult task for Ukraine would be to produce nuclear warheads, which in Soviet times were only produced on the territory of present-day Russia, unlike other sensitive technologies that were scattered across

Ukraine. "Ukraine has some scientific laboratories in Kharkiv: It has the know-how, but lacks the means", said Yesin. Ukraine could theoretically create a dirty bomb – a device combining radioactive materials with conventional explosives – but that would make Ukraine an irredeemable pariah, he added.

*Political Expediency:* According to the Kiev-based political analyst Vladimir Fesenko, Ukraine's Defense Minister Geletey has found himself under mounting political and public scrutiny following a series of defeats suffered by the Ukrainian army during fighting against pro-Russia insurgents in the country's east. "Talking about nuclear arms is a classic PR ploy, he wants to shift attention to a completely different and also essentially insignificant topic," Fesenko, head of the Penta Center for Political Research think tank, told *The Moscow Times*.

The idea of going nuclear is promulgated by certain politicians in Ukraine every now and then, but so far there has been no real substance behind it, he said. In addition, Ukraine needs to respond to what it sees as military threats from Russia, while a nuclear bomb can only be ready in a decade, according to Topychkanov of the Moscow Carnegie Center. "Nobody should be scared, as this is essentially all hot air," agreed Esin.

**Russia's annexation of Crimea in March rendered the Budapest Memorandum null and void, and therefore Ukraine can also relinquish its obligations under the NPT treaty, several Ukrainian parliament deputies argued at the time.**

**Even if Ukraine went ahead and attempted to develop its own nuclear weapon, it would take years, if not decades, and would deplete the country's already scarce resources, Ukraine's economic standing today is such that it will be close to impossible to create a nuclear bomb.**

Source: <http://www.themoscowtimes.com>, 15 September 2014.

**USA**

**US Now Likely to Keep Tactical Nuclear Weapons in Europe**

Last summer (2013) in Berlin, President Barack Obama called for "bold reductions" in US and Russian tactical nuclear weapons to ease the risk of annihilation in Europe. Obama was referring to the roughly 200 B61 nuclear bombs that the US has deployed in five NATO nations stretching from the Netherlands to Turkey – and a Russian arsenal estimated at 2,000 tactical weapons. But since 2013 summer, that hopeful outlook has evaporated. Russia's incursions into Ukraine and nuclear threats made by Russian President Vladimir Putin have killed any chance that the US would withdraw its tactical nuclear weapons anytime soon.

... Support for nuclear deterrence has been echoing across Europe. Newer members of the NATO, including Poland and the Czech Republic, have advocated the continued deployment of US nuclear weapons in Europe. The maintenance of the B61 nuclear force on European soil involves trade-offs of cost, risk and deterrence. The weapons spread over the continent are exposed to potential theft or accidents. But their presence is reassuring to some NATO allies, who believe the weapons show a strong US commitment to their security. And proposed modifications to the B61 under a US\$8.1 billion Energy Department programme should make them more accurate, enhancing their deterrence against Russia.

Sleek and streamlined, packing an explosive force of up to 700 million pounds of TNT, the B61 thermonuclear weapon is the last of its kind, the only TNWs in the US arsenal. Unlike strategic weapons, designed to destroy cities and hardened military targets, the tactical weapons are intended

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**The Groton shipyard of Electric Boat may be looking forward to making two Virginia Class submarines per year, but members of the state's congressional delegation say they'll continue to push for an additional major building program.**

for use on a battlefield, delivered by aircraft at treetop level or from high altitudes. The bomb was designed in the 1960s during the Johnson administration. It was among the first compact nuclear weapons, just 13 inches in diameter. The B61 comes in five models, one able to reduce its explosive power to just 2 per cent of the bomb used in the second world war on Hiroshima, according to

outside estimates. The US began sending battlefield nuclear weapons to Europe in the 1950s.

Source: <http://www.scmp.com>, 22 September 2014.

**Replacing Ballistic Missile Subs "Key to National Defense"**

The Groton shipyard of Electric Boat may be looking forward to making two Virginia Class submarines per year, but members of the state's congressional delegation say they'll continue to push for an additional major building program. Senator Richard Blumenthal and Congressman Joe Courtney visited EB, along with Admiral Jonathan Greenert, the chief of naval operations. They toured the yard, and discussed preliminary work that's underway to replace the Ohio class of submarines. The replacement will be the next generation of SSBNs. The first task for EB is the design work for the new boat.

Blumenthal said it's a step ahead. ... Blumenthal spoke of the strategic importance of the new platform in a changing global security situation. Meanwhile, Joe Courtney said it's essential to keep up the pressure on Congress to continue funding the \$80 million first phase of the project. "There really is no margin for error here in terms of any delays that might be thrown out there for budget reasons," Courtney told a news conference at Electric Boat. ...Twelve boats are planned in the Ohio replacement program. The first would be due to be commissioned in 2031.

Source: <http://wnpr.org>, 25 September 2014.

### Navy Marks 4,000th Ballistic-Missile Submarine Patrol

The Navy marked the 4,000th SSBN patrol on 19<sup>th</sup> September with dual ceremonies at the subs' bases in Bangor, Washington and Kings Bay, Georgia. The first fleet ballistic-missile submarine USS George Washington was commissioned Dec. 30, 1959, and completed the inaugural deterrent patrol in January 1961. Since then, 59 SSBNs have been commissioned in the last 50-plus years.

... Along with strategic bombers and the intercontinental ballistic missiles, the SSBNs make up the third element of the US' triad of nuclear deterrence. Their sea-based missile launch capability makes them the most survivable asset in the event of a nuclear attack. The current Ohio-class SSBNs carry the majority of deployed US nuclear warheads allowing them to stabilize deterrent relationships and render surprise attacks inconceivable. ... As the sea-based leg of US strategic deterrent forces, the current 14 Trident SSBNs carry more than 50 percent of the total US strategic warheads. Today's concept of strategic deterrence seeks to deter attacks on the US or its allies, dissuade adversaries from actions counter to stability, and peace, and to assure allies of the US' commitment to their security."

The current fleet of Ohio-class SSBNs has already had their life-spans extended and must be replaced by new class of SSBNs. ... While the material and mission readiness of the strategic deterrent fleet is primary focus areas, these elements would be mute without the personnel

**The Navy marked the 4,000th SSBN patrol on 19<sup>th</sup> September with dual ceremonies at the subs' bases in Bangor, Washington and Kings Bay, Georgia. The first fleet ballistic-missile submarine USS George Washington was commissioned Dec. 30, 1959, and completed the inaugural deterrent patrol in January 1961. Since then, 59 SSBNs have been commissioned in the last 50-plus years.**

**The upcoming trials include five endo-atmospheric and three exo-atmospheric tests to destroy hostile missiles within and outside the earth's atmosphere. The DRDO claims that the integration of the two intercept systems would result in a hit-to-kill probability of 99.8%.**

readiness of our Sailors. The professional and personal development needs of our Sailors and their families are critical aspects in recruiting and retaining our best and brightest to ensure mission accomplishment in the Submarine Force. ...Source: <http://wtkr.com>, 19 September 2014.

### BALLISTIC MISSILE DEFENCE

#### India to Deploy Defence against Ballistic Missiles by 2016, Says DRDO Chief

India is hurrying up the deployment of an advanced missile defence system to stave off threats from ballistic missiles at a time China's arsenal is growing in sophistication and numbers. Pursuing its BMD programme aggressively, the country will carry out at least eight more tests to knock out incoming missiles before the capability is ready for deployment by the end of 2016, DRDO chief Avinash Chander said. The upcoming trials include five endo-

atmospheric and three exo-atmospheric tests to destroy hostile missiles within and outside the earth's atmosphere. The DRDO claims that the integration of the two intercept systems would result in a hit-to-kill probability of 99.8%.

The DRDO has so far carried out nine BMD tests, including a failed one to intercept a ballistic missile at an altitude of 120 km in April. Past tests

have been successful at ranges of 80 km. India began working on its BMD programme 15 years ago. With several missile projects in its kitty, the DRDO has stepped up efforts to set up missile testing ranges in Andhra Pradesh and Andaman and Nicobar Islands along the lines of the one at Balasore. "Some environmental clearances are awaited. We

need more ranges as the scope of missile work has gone up. By 2020, we hope to emerge as a one-stop shop for all types of missiles," the DRDO chief said. ...

Source: <http://www.hindustantimes.com>, 16 September 2014.

## **USA**

### **Raytheon Begins Building Critical Components for An/Tpy-2 Ballistic Missile Defense Radar**

The MDA will soon have greater agility and capability in its fleet of AN/TPY-2 ballistic missile defense radars. Raytheon has begun construction of two major sub-components of the AN/TPY-2 under a \$53 million contract announced by the DoD on Sept 2. The units Raytheon is building will enable the MDA to rotate sub-components out of the field to receive depot-level upgrades while keeping the radars up and running. AN/TPY-2 is a critical element of the BMD System. It is a mobile X-band radar that is integral in protecting civilians and infrastructure in the US, deployed warfighters, and allied nations and security partners, from the growing ballistic missile threat. US intelligence agencies estimate there are more than 6,300 ballistic missiles not controlled by the US, NATO, China or Russia. That number is expected to reach almost 8,000 by 2020.

"The AN/TPY-2 ballistic missile defense radar is a strategic asset which helps protect the people and things that matter 24/7/365," said Raytheon's Dave

Gulla, vice president of Integrated Defense Systems' Global Integrated Sensors business area. The two trailer-sized sub-components Raytheon is building are the Electronic Equipment Unit and the Cooling Equipment Unit. The EEU contains the processors or "brains" of the AN/TPY-2, with upgrades that enable the radar to more quickly and accurately discriminate threats from non-threats, and enhance performance during missile raids. The CEU keeps the radar operating at the

**Raytheon has begun construction of two major sub-components of the AN/TPY-2 under a \$53 million contract announced by the DoD on Sept 2. The units Raytheon is building will enable the MDA to rotate sub-components out of the field to receive depot-level upgrades while keeping the radars up and running.**

optimal temperature, and distributes power to the system. About AN/TPY-2 AN/TPY-2 is a high resolution, mobile, rapidly deployable X-band radar capable of providing long range acquisition, precision track, and discrimination of all classes of ballistic missiles.

The AN/TPY-2 may be deployed globally in either terminal or forward-based mode. The AN/TPY-2 radar has two modes. In forward-based mode, the AN/TPY-2 cues the BMDS, by detecting, discriminating and tracking enemy ballistic missiles in the ascent phase of flight. In terminal mode, it serves as the fire control radar for the THAAD system.

Source: <http://www.providencejournal.com>, 18 September 2014.

## **NUCLEAR ENERGY**

### **GENERAL**

#### **Technology Revolution in Nuclear Power could Slash Costs Below Coal**

The cost of conventional nuclear power has spiralled to levels that can no longer be justified. All the reactors being built across the world are variants of mid-20th century technology, inherently dirty and dangerous, requiring exorbitant safety controls. This is a failure of wit and will. Scientists in Britain, France, Canada, the US, China and Japan have already designed better reactors based on molten salt technology that promise to slash costs by half or more, and may even undercut coal. They are much safer, and consume nuclear waste rather than creating more. What stands in the way is a fortress of vested interests.

The World Nuclear Industry Status Report for 2014 found that 49 of the 66 reactors under construction – mostly in Asia – are plagued with delays, and are blowing through their budgets. Average costs

have risen from \$1,000 per installed kilowatt to around \$8,000/kW over the past decade for new nuclear, which is why Britain could not persuade anybody to build its two reactors at Hinkley Point without fat subsidies and a "strike price" for electricity that is double current levels.

All five new reactors in the US are behind schedule. Finland's giant EPR reactor at Olkiluoto has been delayed again. It will not be up and running until 2018, nine years late. It was supposed to cost €3.2bn. Analysts now think it will be €8.5bn. It is the same story with France's Flamanville reactor. We have reached the end of the road for pressurised water reactors of any kind, whatever new features they boast. The business is not viable – even leaving aside the clean-up costs – and it makes little sense to persist in building them. A report by UBS said the latest reactors will be obsolete by within 10 to 20 years, yet Britain is locking in prices until 2060.

The Alvin Weinberg Foundation in London is tracking seven proposals across the world for molten salt reactors (MSRs) rather than relying on solid uranium fuel. Unlike conventional reactors, these operate at atmospheric pressure. They do not need vast reinforced domes. There is no risk of blowing off the top. The reactors are more efficient. They burn up 30 times as much of the nuclear fuel and can run off spent fuel. The molten salt is inert so that even if there is a leak, it cools and solidifies. The fission process stops automatically in an accident. There can be no chain-reaction, and therefore no possible disaster along the lines of Chernobyl or Fukushima. That at least is the claim.

The most revolutionary design is by British scientists at Moltex. "I started this three years ago because I was so shocked that EDF was being paid 9.25p per kWh for electricity," said Ian Scott, the chief inventor. "We believe we can achieve parity with gas (in the UK) at 5.5p, and our real

goal is to reach 3.5p and drive coal out of business," he said. The Moltex project can feed off low-grade spent uranium, cleaning up toxic waste in the process. "There are 120 tonnes of purified plutonium from nuclear weapons in Britain. We could burn that up in 10 to 15 years," he said. What remained would be greatly purified, with a shorter half-life, and could be left safely in salt mines. It does not have to be buried in steel tanks deep underground for 240,000 years. Thereafter the plant could be redesigned to use thorium, a cleaner fuel.

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The reactor can be built in factories at low cost. It uses tubes that rest in molten salt, working through a convection process rather than by pumping the material around the reactor. This cuts corrosion. There is minimal risk of leaking deadly cesium or iodine for hundreds of miles around. ... It would cost \$2bn (overnight cost) for a 550-megawatt plant, less than half the Hinkley Point project on a pro-rata basis. Transatomic says

it can generate 75 times as much electricity per tonne of uranium as a conventional light-water reactor. The waste would be cut by 95pc, and the worst would be eliminated. It operates in a sub-critical state. If the system overheats, a plug melts at the bottom and salts drain into a cooling basin. Again, these are the claims.

The most advanced project is another Oak Ridge variant designed by Terrestrial's David LeBlanc, who worked on the original models with Weinberg. It aims to produce power by the early 2020s from small molten salt reactors of up to 300MW, for remote regions and industrial plants. "We think we can take on fossil fuel power on a pure commercial basis. This is a revolution for global energy," said Simon Irish, the company's chief executive. Toronto-based Terrestrial prefers the "dry tinder" of uranium rather than the "wet wood" of thorium, which needs a blowtorch to get started and keep going, typically plutonium 239. But it could use either fuel.

A global race is under way, with the Chinese trying everything at the Shanghai Institute of Nuclear and Applied Physics, reportedly working under “warlike” pressure. They have brought forward their target date for a fully-functioning molten salt reactor – using thorium – from 25 to 10 years. Ian Scott, at Moltex, originally planned to sell his technology to China, having given up on the

**A global race is under way, with the Chinese trying everything at the Shanghai Institute of Nuclear and Applied Physics, reportedly working under “warlike” pressure. They have brought forward their target date for a fully-functioning molten salt reactor – using thorium – from 25 to 10 years.**

West as a lost cause. He was persuaded to stay in Britain, and is talking to ministers. “The first stage will cost around £1bn, to get through the regulatory process and build a prototype. Realistically, only the government can do this,” he said. ...

*Source: Excerpted from article by Ambrose Evans-Pritchard, <http://www.telegraph.co.uk>, 24 September 2014.*

### **Developing Countries Embracing Nuclear Energy Despite Fukushima Woes**

Three years after Japan closed all of its nuclear plants in the wake of the Fukushima meltdown and Germany decided to shut its industry, developing countries are leading the biggest construction boom in more than two decades. Almost two-thirds of the 70 reactors currently under construction worldwide, the most since 1989, are located in China, India, and the rest of the Asia-Pacific region. Countries including Egypt, Bangladesh, Jordan and Vietnam are considering plans to build their first nuclear plants, according to Bloomberg New Energy Finance in London. Developed countries are building nine plants, 13 percent of the total.

Power is needed as the economies of China and India grow more than twice as fast as the US. Electricity output from reactors amounted to 2,461 terawatt-hours last year, or 11 percent of all global power generation, according to data from the OECD

and the IEA. That’s the lowest share since 1982, the data show.

... China’s electricity consumption is forecast to jump 63 percent by 2020 to 7,295 terawatt-hours from 4,476 terawatt-hours in 2011, while India’s demand is predicted to grow by 45 percent from 2010 through 2020, according to the US Energy Information

Administration. Over the same period, demand growth in 22 European members of the OECD is forecast to be 3.6 percent.

Nations are diversifying their energy sources as Germany and other developed countries increase the use of solar and wind power to limit emissions of greenhouse gases blamed for floods, changing weather patterns and rising sea levels. They are also seeking to boost energy independence as the conflict in Ukraine threatens 30 percent of Europe’s gas supplies. China plans to complete 29 new reactors from 2018 through 2030, according to estimates by New Energy. That would more than double the country’s fleet to 49, according to World Nuclear Association data.

Shanghai Electric Group closed 5.1 percent higher in Hong Kong, a gain of 15 percent from Sept. 19, after *China*

*Securities Journal* reported that China will allow construction to start on four coastal nuclear power projects with a combined capacity of more than 10 gigawatts.

India plans six new units that would boost fission power output by 81 percent by 2030, while US utilities plan to build five new units, according to New Energy’s Global Nuclear Market Outlook dated Sept. 16.

European power generators are building four new units, including the 1,600-megawatt Olkiluoto-

3 project in Finland, which has been delayed until 2018 from its original 2009 start.

Once the world's biggest planned reactor, Olkiluoto-3 is being constructed by Paris-based Areva SA and Siemens AG of Munich. Toshiba Plant Systems and Services Corp. of Japan, Westinghouse Electric Co. of the US, Canada's SNC-Lavalin Group Inc. and Russia's AtomStroyExport also build atomic plants.

The capital cost of a US reactor starting in 2019 is more than four times that of a new gas plant and 19 percent more than a conventional coal unit, according to the EIA. Most atomic reactors currently operating have a design life span of 30 to 40 years, according to the World Nuclear Association. The current average age of nuclear units is 29. Construction peaked in 1984 when 83 reactors were being built, according to United Nations' International Atomic Energy Agency data compiled by New Energy.

... More than 60 percent of the global power plant investment from this year through 2035 will be in renewables, according to the IEA's World Energy Outlook. Fossil-fuel plants will account for 30 percent and nuclear the remainder, the Paris-based group said. Nuclear plants may supply as much as 12 percent of total power production by 2050, according to the IAEA. The share of global electricity generation met by atomic plants fell for a 12th consecutive year to less than 11 percent in 2013, BP Plc data show.

Eight countries including Germany, Italy and Taiwan halted construction programs or closed plants after an earthquake and tsunami caused a triple meltdown at the Fukushima No. 1 plant in March 2011, according to Chris Gadomski, the head of nuclear research at New Energy in San Francisco. China stopped building reactors for two years while the United Arab Emirates began constructing two units the week after the accident, he said.

Germany permanently closed eight of the 17 atomic plants that were operating in 2011, with the remaining 11 units scheduled to shut from May through 2022. Japan hasn't restarted any of its 48 plants even as two facilities were cleared to resume operating by the country's nuclear regulator. Iran and western countries led by the US remain deadlocked over the Middle Eastern nation's plans for nuclear power. ...

Source: <http://www.japantimes.co.jp>, 29 September 2014.

**Siberian Chemical Combine, based in Tomsk, said on 18<sup>th</sup> September it has completed testing of the first full-scale TVS-4 fuel assembly containing nitride fuel. The assembly is intended for the BN-600 fast neutron reactor, which is the third unit of the Beloyarsk nuclear power plant.**

## RUSSIA

### Russia Makes Fast Neutron Reactor Progress

Siberian Chemical Combine, based in Tomsk, said on 18<sup>th</sup> September it has completed testing of the first full-scale TVS-4 fuel assembly containing nitride fuel. The assembly is intended for the BN-600 fast neutron reactor, which is the third unit of the Beloyarsk

nuclear power plant. Vladimir Troyanov, chief production engineer of the Breakthrough project, said the materials used for the TVS-4 fuel assembly "possessed higher radiation stability that permits a substantial increase in its service life and, in turn, the efficiency of fast neutron reactors." The product that is to follow – TVS-5 – is being designed for the pilot demonstration reactor BREST-OD-300, which will be built at the SCC site, Troyanov said. BREST-300 is a lead-cooled reactor system developed by the N A Dollezhal Research and Development Institute of Power Engineering (NIKIET).

Meanwhile, Krasnoyarsk-based Mining and Chemical Combine (MCC) said on 16 September it has produced the first industrial batch – 10 kg – of mixed-oxide (MOX) fuel. MOX is a mixture of plutonium and uranium dioxides. Tablets of the MOX fuel will enter serial production for use at the BN-800 fast neutron reactor, or unit 4 at the Beloyarsk plant, which is in the Sverdlovsk district. A MOX production line, now undergoing start-up



and adjustment, was assembled in a mine 200 meters underground at the MCC site and will become fully operational by the end of 2014, MCC said. SCC and MCC are both subsidiaries of Rosatom.

Source: <http://www.world-nuclear-news.org>, 19 September 2014.

## **SAUDI ARABIA**

### **Saudi Arabia Aims for Nuclear Power within 20 Years**

To help address its energy needs, Saudi Arabia announced plans to incentivize both private and public investments in energy sources other than oil. Within 20 years, the Saudi Royal Family aims to invest \$80 billion and \$240 billion so that nuclear and solar, respectively, will each provide 15 percent of the Kingdom's power needs. The transition is intended to happen quickly, with the first nuclear reactor expected to come online in only eight years. Beyond minimizing carbon emissions, the nation's energy efforts are an instance of an energy symbiosis, whereby energy production techniques are uniquely suited to consumption practices and the landscape where production occurs.

Last 16 September, energy officials in Saudi Arabia announced plans to become a major nuclear energy state, assuring the reactors would be used only for peaceful purposes. They intend to move fast, beginning construction by year's end. The Saudi Royal Family hopes that nuclear will provide 15 percent of the Kingdom's power (18 GWe) within 20 years, together with a similar 15 percent (40 GWe) from solar. They are planning to invest \$80 billion to build more than a dozen nuclear power plants as fast as possible, intending for the first reactor to come online in only eight

**Within 20 years, the Saudi Royal Family aims to invest \$80 billion and \$240 billion so that nuclear and solar, respectively, will each provide 15 percent of the Kingdom's power needs. The transition is intended to happen quickly, with the first nuclear reactor expected to come online in only eight years.**

**Energy consumption in Saudi Arabia is growing faster than any other country in the Middle East, and almost all of it is fueled by oil and natural gas. Total electricity consumption in Saudi Arabia exceeds 200 billion kWhs per year and is expected to double by 2030.**

years. Investment in solar for the same energy production will take about \$240 billion in investment, although breakthrough technologies in the next decade should cut that cost in half.

... Nuclear and solar are especially good for cogeneration of electricity and heat for desalination and have become central to Saudi Arabia energy strategy. With over

500,000 square miles of arid cloudless land, the Kingdom is well suited to concentrating solar technologies. But renewables need a base load source like nuclear for support. The Royal Family hopes that nuclear will provide 15% of the Kingdom's power within 20 years, together with a similar 15 percent from solar.

Energy consumption in Saudi Arabia is growing faster than any other country in the Middle East, and almost all of it is fueled by oil and natural gas. Total electricity consumption in Saudi Arabia exceeds 200 billion kWhs per year and is expected to double by 2030. Americans are not generally aware that the two largest uses of power in the Middle East are for desalinating seawater and residential cooling. Saudi Arabia desalinates over 250 billion gallons of seawater each year, and that number will double in the next 10 years as the population and industrialization increase.

More than 50 percent of the Kingdom's energy use is residential and the average energy use per person per year is over 6,000 kWhs, putting the Saudi people as a whole firmly in the middle class, and on the path we want for all humanity. But according to the Gulf Research Center, Saudi Arabia's

growing population and urbanization is putting pressure on even its huge oil supplies. To help address their energy needs, the Saudi energy

sector has been restructured to incentivize both private and public investments in energy. Industrial consumers are now allowed to generate their own power and sell excess back to the government. Parts of the state-owned Saline Water Conversion Corporation will be privatized.

But the biggest change to their energy sector is a focus on renewable and nuclear for new generating capacity. Nuclear and solar are especially suited to cogeneration of electricity and heat for desalination and have become central to the Kingdom's energy strategy. With more than 500,000 square miles of arid cloudless land, Saudi Arabia is well suited to both photovoltaic and concentrating solar technologies. And to have significant renewable over such a large area separated by long distances from the main population centres, there has to be sufficient base load capacity for support. And that is nuclear's primary strength.

... The possible sites for these Gen III reactors include Jubail on the Persian Gulf and Rabuk and Jizan on the Red Sea. The reactors would power their own desalination plants for water. Since Saudi Arabia burns almost a billion barrels of oil a year to produce electricity, this change in production is critical to their economic future. It is much more profitable to sell their oil and gas to China and the West instead of burning it for power. The cost of the oil used to burn to produce electricity is heavily subsidized by the government, which increases waste and inefficiency and is detrimental to their overall GDP. Saudi officials are worried that the present trend of increasing oil use in the Kingdom will hurt their economy in only a few short years, so this change is needed right now.

The Saudis are not alone in the region in wanting nuclear and renewables to replace their precious oil and gas in generating power. Abu Dhabi in the

UAE is building four nuclear reactors at Barakah for just this reason. In Dubai's 20-year plan, Saeed Mohammed Al Tayer of the Supreme Council of Energy predicted that "twenty percent of [Dubai's] energy supply will in future be drawn from a peaceful civil nuclear program." Recently the UAE opened what was, at the time, the largest solar plant in the world, the 100 MW Shams 1 at a cost of about \$600 million. But two hundred Shams

1 arrays will be needed to equal the output of the four Barakah nuclear reactors when Kepco brings them online for Abu Dhabi in several years.

The Saudis understand this math. Nuclear is the best long-term base load source they could have. Not to mention when a country goes nuclear it attains a certain level of respect from its neighbours. Just ask Iran. With more than a dozen reactors in the plan, global competition for the Saudi contracts is fierce. In September

2013, both GE Hitachi Nuclear Energy and Toshiba/Westinghouse signed contracts with Exelon Nuclear Partners to pursue reactor construction deals with the Saudis. France's Areva and EDF have signed a number of agreements with Saudi companies and universities. The Saudis have agreements with Argentina and South Korea, and other deals are in the works with Russia, the Czech Republic, and the United Kingdom. There is even a deal emerging with the China National Nuclear Corporation.

The reason so many agreements are in place is that Saudi energy officials are being cautious, not wanting to put all their eggs in one basket, and are looking for multiple vendors for the various major components like reactors, steam generators, turbines, back-up generation, and buildings. Unfortunately, American nuclear companies may not take part in this project, or in others that are starting in the region, unless these countries sign a 123 Agreement with the US required by our Atomic Energy Act. 123 Agreements are meant to discourage activities like

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uranium enrichment and reprocessing of spent fuel that can also be used for weapons production, while encouraging activities that are only for peaceful nuclear energy. ...

Source: Excerpted from article by James Conca. <http://oilprice.com>, 21 September 2014.

## URANIUM PRODUCTION

### AUSTRALIA

#### Anti-Uranium Activists Criticise NSW Exploration Program

Anti-nuclear campaigners have criticised the NSW government for opening up the state to uranium exploration. On the second week of September the state government invited six companies to apply for exploration licences. The move comes two years after NSW overturned a uranium exploration ban. Mining uranium is still restricted. Three locations around NSW – near Broken Hill, near Cobar and south of Dubbo – have been earmarked for drilling activity. Natalie Wasley, spokeswoman for the Beyond Nuclear Initiative, said the decision was disappointing.

“Uranium has very unique and dangerous properties and risks,” Wasley said. “It’s linked to the production of the world’s most toxic and long-lasting industrial waste, as well as proliferation of the world’s most destructive weapons, so it poses a risk to workers, to communities and the environment.” Wasley said the sector will only create a small number of jobs, and claims the risks associated with uranium outweigh any economic benefits. “We know that in rural and regional areas there’s a much better opportunity for

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**French government-controlled Areva – the world’s biggest nuclear company – is understood to be planning legal action against the Australian government over a decision 2013 to veto mining at its multibillion-dollar Koongarra uranium deposit by including it in the Kakadu National Park.**

long-lasting sustainable jobs in the renewable sector.” ...

Source: <http://www.miningaustralia.com.au>, 15 September 2014.

### FRANCE

#### Areva Suing Over Kakadu

French government-controlled Areva – the world’s biggest nuclear company – is understood to be planning legal action against the Australian government over a decision 2013 to veto mining at its multibillion-dollar Koongarra uranium deposit by including it in the Kakadu National Park. The claim has the potential to open up the Commonwealth to a payment of hundreds of millions of dollars. Last March, the Senate passed a bill reversing the exclusion of Areva’s Koongarra uranium deposit from the Kakadu National Park, removing the possibility of future uranium mining there.

The decision was pushed through under the former Labor federal government but was politically uncontroversial and passed the Senate with bipartisan support. Both major parties committed to the move during the 2010 federal election campaign sparking an angry response from Areva. At the time Areva said it would seek legal advice over a possible infringement of its property right. Areva, based in Paris, would not respond directly to questions on whether it was planning legal action, but said it was examining its options following the government’s decision.

... It was understood the action would be lodged against the Commonwealth in the Federal Court and Areva

could attempt to tap a special Commonwealth fund set up for aggrieved parties. It was understood Areva would seek, at a minimum, to cover its costs on the Koongarra project, which it bought in 1995, and might also sue for compensation for lost earnings, exposing the government to a payment of several hundred million dollars. The Koongarra uranium project covered 12.5 square kilometres and contained about 14,500 tonnes of uranium at an average grade of 0.8 per cent uranium oxide. It was discovered in 1970 by Canadian-owned Noranda Australia. Depressed uranium prices recovered to \$US36.50 a pound on the third week of September, their highest levels since July 2013. Prices reached heights of \$US138 a pound in June 2007 but crashed after the Fukushima nuclear disaster in 2011 in Japan and had been under pressure since. Analysts suggested the market would be in surplus until about 2021.

Areva, which drew about 20 per cent of its revenues from uranium production and had mines in Canada and Niger, was among the big players to have expressed confidence in a price rebound. 2013's Senate bill repealed the Koongarra Project Area Act 1981, which excised Koongarra from the Kakadu National Park in the Northern Territory. At the time, Mr Burke said "mining will be prohibited forever" at Koongarra. It followed a successful request in 2011 by the Labor government to the World Heritage Committee to expand the World Heritage-listed Kakadu National Park to include land that held the Koongarra deposit. At the time, Areva was understood to have lobbied the Australian government to drop its request. Areva had also run into grief with the traditional owners of the land, who, rather than take a big payout from the French group, offered the land to the government for inclusion in Kakadu.

The deposit sat near the tourist attraction Nourlangie Rock, a sacred site for traditional

owners. Areva also told *Business Day* that "we have been a pioneer in uranium exploration and discovery in Australia since the 1960s and are committed to supporting its future development in the country". ...

Source: <http://www.smh.com.au>, 25 September 2014.

## GENERAL

### Cameco Corp.: A Reliable Play on Uranium Recovery

More than three years ago, the tsunami in Japan which led towards the Fukushima nuclear disaster triggered a collapse of the uranium prices, falling from a peak of \$65 per pound in early 2011 to less than \$30 per pound over the last four months ending August. However, since the end of August, the commodity's prices, for October delivery, have recovered to more than \$33 per pound.

*Supply-side Issues:* The improvement in prices was largely due to supply-side issues. Due to the slump in prices, Uranium producers from all around the world started cutting back on their production. Moreover, the Ukraine conflict and the subsequent sanctions on

Russia, which provides a significant portion of uranium enrichment services to companies all around the world, could also hit uranium supplies.

Finally, in August, Cameco Corp. the largest US listed uranium miner shut down its flagship McArthur River mine, the biggest in the world, due to a labour dispute which acted as a major catalyst behind the improvement in uranium prices. On 12 September, the company signed a tentative agreement with the worker's union, ending the 17-day strike. The industry could witness additional closures in the coming months due to the pricing pressure. Analysts at Macquarie have forecast a 6% drop in production from mines in the current year.

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*Improving Demand:* Meanwhile, according to various estimates by EIA, as well as other organizations, the demand for electricity is expected to continue growing in the foreseeable future. With limited supplies of fossil fuel and increasing concerns regarding greenhouse gas emissions, the contribution of nuclear energy to fulfill energy needs will likely grow over the long term. As such, there are 70 new nuclear reactors currently under construction all around the world, of which 29 are being built in China, 6 in India, and more than 9 in other Asian countries. These new reactors, which will come online through 2023, will lead towards an increase in consumption of uranium.

*Source: <http://seekingalpha.com>, 17 September 2014.*

## **NUCLEAR COOPERATION**

### **INDIA-CHINA**

#### **India to Hold Talks with China on Civil Nuclear Cooperation**

India will open talks on civil nuclear energy cooperation with China, PM Narendra Modi said on 18 September after summit talks with Chinese President Xi Jinping in New Delhi. The announcement, part of the new government's push to broaden its nuclear energy sector, comes on the heels of a deal India struck in September to buy uranium from Australia to increase its fuel supplies. ...

Ahead of Xi's visit, Chinese Assistant Foreign Minister Liu Jianchao told reporters that China had a "positive attitude" towards nuclear cooperation with India, but offered no details. ... Any deal for India to buy civil nuclear reactors from China may take years, but both countries benefit by starting the conversation. ...

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*Source: <http://www.deccanchronicle.com>, 18 September 2014.*

### **KAZAKHSTAN-RUSSIA**

#### **New Deal for Nuclear Energy Industries in Kazakhstan, Russia**

Kazatomprom, a state-owned nuclear holding company in Kazakhstan, entered into a cooperation agreement with Rosatom, the central holding company for Russia's entire nuclear energy complex. The two companies agreed to cooperate in the fields of

training of personnel in the nuclear industry, as well as the promotion of nuclear energy. Kazatomprom's Chairman Nurlan Kapparov and Rosatom CEO Sergey Kiriyenko reached the agreement during the 58th session of the four-day General Conference of the IAEA, which took place in Vienna between 22 and 26.

According to reports in the local media, the MoU signed by the two men reflects the willingness of both sides to combine efforts. They agreed to launch a public information platform for collaboration, which is aimed at increasing public awareness about alternative sources of energy. Both sides are also keen to encourage young people to pursue professions that are in demand in the nuclear industry and the energy sector.

What is more, the memorandum also foresees the participation of Rosatom in Kazatomprom's project to create Kazakhstan's first information centre on nuclear energy in Astana. It is also worth noting that Kazakhstan ranks second in the world as regards uranium reserves (0.85 million tonnes) and tops the list in terms of uranium mining. In fact, uranium production in Kazakhstan totals 21,240 tonnes (37% of global production). It is all exported, mainly to China and countries in Europe.

*Source: <http://www.neurope.eu>, 29 September 2014.*

**SOUTH AFRICA–RUSSIA**

**S. Africa Signs Nuclear Cooperation Deal With Russia**

South Africa has signed a nuclear power cooperation deal with Russia, authorities said on 22 September. Under the deal, South Africa will get up to eight nuclear reactors from Russia, with the capacity to build up to 9.6 GW (8 NPP units) of nuclear power plants by 2030, state-run Russian nuclear firm Rosatom said in a statement. The deal was signed on 22 September in Vienna, at the margins of 58th session of the IAEA General Conference. The agreement lays the foundation for the large-scale NPP procurement and development programme of South Africa based on the construction in South Africa of new nuclear power plants with Russian VVER reactors.

These will be the first NPPs based on the Russian technology to be built on the African continent. The signed agreement, besides the actual joint NPP construction, provides for comprehensive collaboration in other areas of nuclear power industry, including construction of a Russian-technology based multipurpose research reactor, assistance in the development of South African nuclear infrastructure, education of South African nuclear specialists in Russian universities and other areas. ...

Source: <http://www.shanghaidaily.com>, 23 September 2014.

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Republic [of France] hoped that the negotiations can come to a resolution quickly. He reiterated the position of France: Iran must implement concrete measures to demonstrate in a certain and verifiable way that it will not acquire a military nuclear capability," a statement from Hollande's office said. "The two Presidents also discussed the situation in Iraq, Syria and

the region and exchanged views on how to fight against terrorism," the statement added, noting that the two leaders also examined prospects of bilateral cooperation that would open when confidence is restored with regard to the nuclear issue. ...Source: <http://en.ria.ru>, 23 September 2014.

**ISRAEL**

**Arab States Target Israeli Arsenal at Nuclear Meeting**

Arab countries have circulated a resolution at a nuclear meeting that singles out Israel for special attention over its alleged nuclear arsenal. The draft echoes previous such resolutions at annual meetings of the Vienna-based IAEA. Backed by 18 Arab states, including Syria, the resolution expresses concern "about the Israeli nuclear capabilities" and calls on Israel to join the nuclear NPT. ...

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The IAEA rejected a similar initiative, which the US spoke out against, in September 2013 by a vote of 51 to 43 at its annual meeting in Vienna, in which 32 nations abstained. Had the resolution been passed by the IAEA, Israel would have been called upon to sign on to the Nuclear NPT and submit to agency scrutiny of its nuclear facilities. The Arab initiative was part of mounting international pressure on Israel to relinquish – or at least admit to possessing – weapons of mass destruction. The heightened interest in the Jewish state's alleged nuclear,

**NUCLEAR PROLIFERATION**

**IRAN**

**Hollande, Rouhani Discuss Iranian Nuclear Program at UNGA**

French President Francois Hollande discussed Iran's nuclear program with his Iranian counterpart Hassan Rouhani on the sidelines of the UNGA in New York. "The President of the

chemical and biological weapons comes amid indications from Iran that it's ready to show flexibility in nuclear talks, and in the wake of a Russian-brokered deal that would see Syrian President Bashar Assad's chemical weapons shipped off and eventually destroyed.

A similar version of the resolution was narrowly passed four years ago at the IAEA, but its implementation was postponed due to pressure from Western governments. In 2011 and 2012, Arab member states refrained from pushing the initiative fearing it would harm attempts to convene an international conference to rid the Middle East of WMDs. ...

Source: <http://www.timesofisrael.com>, 24 September 2014.

## **MIDDLE EAST**

### **Qatar Concerned Over Nuclear Proliferation**

Qatar has expressed deep concern over the grave consequences that threaten peace and security as a result of nuclear proliferation in the Middle East, calling on the director-general of the IAEA to hold further consultations with regional countries to facilitate early implementation of IAEA comprehensive safeguards on all nuclear activities in the region. Qatar has also demanded that all parties, especially those bearing a special responsibility for maintaining international peace and security, provide all assistance to the director-general to facilitate creation of a Middle East zone free of nuclear weapons as soon as possible.

In a speech at a meeting of the IAEA Board of Governors, Qatar's member Ahmed Hassan Al Hammadi thanked the director general for his report on the application of IAEA safeguards in the Middle East document. The Qatari delegation stressed that it added its voice to the NAM's statement, which was delivered by the ambassador of Iran. During the speech, the Qatari delegation made a number of observations,

including that for 40 years the UNGA has been annually adopting a resolution calling for a Middle East NFE, the IAEA's adoption of a similar decision about a quarter of a century ago, the issuance of UN Security Council Resolution 487, which called on Israel to subject its nuclear facilities immediately to the comprehensive safeguards system of the IAEA 33 years ago, and the resolution of the 1995 NPT Review Conference on the Middle East 19 years ago, pointing out that until now none of these resolutions have been implemented.

He also noted that the absence of progress made it incumbent to consider the matter seriously due to concern over the grave consequences of nuclear

activities in the Middle East not dedicated to peaceful purposes, and the urgent need to strengthen the non-proliferation system, nuclear disarmament and achievement of the NPT's global application. Al Hammadi added that paragraph (4) of the Director General's report summarized the main obstacle facing the establishment of the (nuclear weapons free) zone by saying "all countries in the region except Israel are parties to the NPT, and have pledged to accept the IAEA comprehensive

safeguards system. Accordingly, Israel's joining of the NPT and the subjection of its facilities to the IAEA safeguards system will remove the main obstacle to the establishment of the (nuclear weapons free) zone.

Dr Al Hammadi noted that the conclusion reached by the director general in his report that he was unable to achieve progress in the implementation of resolution 15 of the 57th session of the General Conference, was expected in the light of the preconditions imposed by Israel to block the establishment of the zone.

The director general's report pointed to the position of the Arab states, which complies with logic, international law and relevant resolutions

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of the UN and the IAEA, which say that Israel's accession to the NPT and implementation of comprehensive safeguards on its facilities will pave the way to the creation of the zone and a just and lasting peace in the region. He said the imposition of terms supposed to achieve a comprehensive peace in the region as a precondition for engagement in efforts to create the zone was an indication of lack of political will.

Source: <http://thepeninsulaqatar.com>, 20 September 2014.

## NORTH KOREA

### S. Korea Confirms the North's Pursuit of Submarine-Launched Ballistic Missiles

North Korea has been developing a submarine-based ballistic missile launch system which could send nuclear-tipped missiles to as far as Alaska, military officials and analysts here said. The Joint Chiefs of Staff confirmed for the first time a report that South Korea has detected signs of the North's development of SLBMs. "There are some signs that indicate the possibility of a North Korean submarine equipped with a missile," the JCS said in a parliamentary report in response to a US media report on the North's suspected SLBMs development.

Source: <http://www.worldtribune.com>, 25 September 2014.

## NUCLEAR NON-PROLIFERATION

### PAKISTAN

#### Pakistan Aspires to International Role

Pakistan would like to be a full member of export control regimes and to play a part in the international nuclear industry, according to the country's statement to the IAEA'S 58th General Conference.

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Ansar Parvez, chairman of the PAEC, pointed to the country's small but well-established nuclear power sector, which currently boasts three operating reactors: Karachi 1 (KANUPP) which started up in 1972, and two units at Chashma which have been operating since 2000 and 2011, respectively. Two further units are under construction at Chashma under a long-term cooperation agreement with China, and last year ground was broken for the first of two Chinese-designed ACP1000 units at Karachi. At that time Pakistan's prime minister announced a long-term program envisioning 40,000 MWe of nuclear capacity by 2050.

In addition to its nuclear generating capacity, safeguarding, safety and international cooperation credentials, Parvez commented on the country's medical radioisotope production operations.

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Molybdenum-99, the precursor for the technetium-99m used in medical imaging, is already made at the PINSTECH, but Parvez said the country is looking to establish another Mo-99 facility based on low-enriched uranium.

Due to its nuclear weapons program and its status outside the NPT, Pakistan has been largely excluded from trade in nuclear plant or materials with other countries. China, notably, has forged strong nuclear energy links with Pakistan, and the country is a major recipient of technical cooperation from the IAEA as well as being a member of the IAEA Board of Governors. Summing up, Parvez appeared to underline the country's desire to become more fully involved in the international nuclear market. "Pakistan has the experience, the credentials and the potential to become a recipient and supplier of nuclear technology for peaceful purposes. Pakistan aspires to play its part at international



level as a mainstream partner, including as full member of export control regimes, particularly the NSG", he said.

Source: <http://www.world-nuclear-news.org>, 26 September 2014.

## **TURKEY**

### **Turkey Denies Nuclear Weapons Plans**

... Turkey has denied media claims that it is planning to develop nuclear weapons. Following allegations in German newspaper *Die Welt* that Turkey is seeking to acquire enriched uranium, the Turkish Foreign Ministry spokesman Tanju Bilgic said in a statement on Thursday: "The claims published in *Die Welt* on 21 September have nothing to do with the truth. ...

**The world would need to do more than simply voice calls for limiting nuclear weapons, reducing their range, constraining their deployments or reducing their role in security policies.**

He added that Turkey strongly adhered to the peaceful use of nuclear energy within the framework of the treaty. Due to Turkey's proximity to "regions posing high risks of proliferation of weapons of mass destruction" it has prioritised turning the Middle East into a "WMD-free zone," the statement added, calling for a conference on establishing the zone "at the earliest." ...

Source: <http://www.middleeasteye.net>, 26 September 2014.

## **NUCLEAR DISARMAMENT**

### **GENERAL**

#### **World Must Move Toward Total Elimination of Nuclear Weapons – UN Chief**

The time has come for the total elimination of nuclear weapons stockpiles, Secretary-General Ban Ki-moon declared as he urged the revival of nuclear disarmament as a "top international priority." In his message, delivered in observance of the first annual International Day for the Total Elimination of Nuclear Weapons, the Secretary-

General voiced concern about the delayed status of ongoing negotiations to eliminate the atomic threat still present around the world. "The lack of such negotiations is disrupting the delicate balance between international commitments to disarmament and non-proliferation," affirmed Mr. Ban. "The time has come for those negotiations to begin."

... In his remarks, Mr. Ban noted that six years ago he had put forward a five-point proposal on nuclear disarmament indicating two possible

paths for progress: "agreement on a framework of separate, mutually reinforcing instruments, or through a nuclear-weapons convention, backed by a strong system of verification." "What matters most is not which path is taken," Mr. Ban continued, "but that the chosen path is heading

in the right direction – toward the internationally agreed goal of the total elimination of nuclear weapons."

He cautioned that on the newly established International Day the world would need to do more than simply voice calls for limiting nuclear weapons, reducing their range, constraining their deployments or reducing their role in security policies. "It is a day on which to imagine the consequences should the dangerous and fragile doctrine of nuclear deterrence fail," the Secretary-General concluded. "Let us revive nuclear disarmament as a top international priority, in the interest of the peace and security of all and of future generations."

Source: <http://www.un.org>, 26 September 2014.

### **UK**

#### **Scottish Referendum Rekindles Debate over Nuclear Disarmament**

... One of the driving issues of the debate is the fate of Britain's nuclear-armed submarines. That's because the UK's Trident submarine fleet and its 225 warheads are based near Glasgow

and the Scottish government wants them gone. As FSRN's Jacob Resneck reports the debate in Scotland isn't just over independence it's rekindled the debate over nuclear freeze. On a bluff over Faslane Naval Base on the River Clyde, a polite but suspicious military policeman shadows myself and two local anti-nuclear critics as we gaze down on what's perhaps Britain's most sensitive military installation.

... If the Scottish referendum succeeds he may get his way. The Scottish National Party which is driving politics from Edinburgh has pledged to evict the Trident submarines and the warheads being stored near the town of Helensburgh within four years. It's not an idle threat. The SNP has been campaigning for nuclear disarmament for years and public opinion supports it. ... Crawford argues should Scotland become independent, the Trident issue could be a top priority after the inevitable horse trading begins over the myriad of issues that will inevitably arise as it negotiates its exit from the United Kingdom. ...

But in the community of Helensburgh, it's a hot issue. Not least because so many have moved here to work on the base. ... There are many surprises and contradictions here. Vivien Dance, an elected councilor and vocal critic of nuclear arms, moved here in the 1970s when her husband, a submarine officer, was transferred to work on the nuclear--armed Polaris submarines. Today she's a vocal YES campaigner despite the fact that both she and her husband hail from Yorkshire in England. ... But not everyone in this community feels this way. ... There's been

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talk about moving the warheads to neighboring France or even the Atlantic seaboard of the US. But whatever the case, should Scotland achieve independence it would find itself with real leverage over its larger neighbor with regards to the future of Britain's nuclear arsenal.

Source: <http://fsrn.org>, 17 September 2014.

## NUCLEAR TERRORISM

### USA

#### NuclearDetection Architecture also Deters

To deal with the danger of a terrorist nuclear attack, one of the greatest threats to US and global security, the US has adopted a variety of measures. Intelligence operations, military actions and financial restrictions all can undermine the ability of terrorist groups to mount such attacks, as can cooperative efforts with other countries to help secure nuclear materials and weapons from theft. Interdiction of illegal nuclear shipments further impede efforts by terrorist groups to acquire such weapons.

An essential, but little recognized, bulwark against nuclear terrorism is the Global Nuclear Detection Architecture (GNDA) maintained by the US and other countries. The purpose of the nuclear detection architecture, according to the Department of Homeland Security, is to "protect against terrorist attacks" through the "coordinated detection, analysis, and reporting on the unauthorized importation, possession, storage, transportation, development, or use" of nuclear materials or weapons.

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But what is underappreciated is how the very presence of the architecture can also deter, not simply prevent, an attack. Detection capabilities are located at foreign seaports, airports and land border crossings; on the sea; at US sea, air, and land ports of entry; and within the US interior. The detection capabilities of the GNDA are both technical and nontechnical, including sensors that pick up radiation emitted by nuclear or radiological materials and the surveillance of terrorist activities.

When established nearly a decade ago, the GNDA was conceived as a way “to protect” the US against a nuclear attack by detecting attempts to smuggle in a nuclear weapon or material, thus stopping a weapon in transit. Even if terrorists penetrate an outer layer of the GNDA, that movement could alert other layers of the architecture for subsequent intercept. But the presence of the detection architecture may also protect by deterring. US strategy for counterterrorism recognizes that defensive capabilities can serve to deter attacks. As a June 2011 White House report, “National Strategy for Counterterrorism,” notes. “Presenting the US as a ‘hardened’ target is unlikely to cause al-Qaida and its affiliates and adherents to abandon terrorism, but it can deter them from attacking particular targets or persuade them that their efforts are unlikely to succeed.”

Precisely right; deterrence can help prevent attack by confronting terrorists with costs and risks that exceed the anticipated benefits of attacking. Some might argue that the risk of detection is inadequate to deter terrorists because they are fanatics. But fanaticism does not exclude calculation, and an opponent that calculates is potentially susceptible to deterrence. Terrorists

are willing to violate all rules of warfare, but they certainly calculate potential risks, costs and gains when planning attacks. US intelligence and military officials reportedly have determined that “fear of humiliation and failure kept al-Qaeda from attempting some attacks on a 9/11 scale after 2001, when defenses against terrorist strikes were heightened.”

Terrorist planners will be deterred when they perceive the risk of detection by the GNDA and related complications as so great that they stand back from an attack they otherwise would undertake. Deterrence will be strengthened if terrorists not only respect the risks of detection by the GNDA, but understand detection means a failed attack, weapons seized and operatives accompanying the weapon captured or killed. Long-term incarceration may be a deterring prospect—including for those hoping for the glories of death in a mission.

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In recent years, US officials at the Domestic Nuclear Detection Office have begun to think about how the GNDA’s capabilities might be best exploited to also deter. First, while the layers of the GNDA are robust, they may not be impenetrable (defenses rarely are) and discouraging an attack through deterrence could usefully complement GNDA capabilities to block an attack through detection. Second, the GNDA’s deterrent effect, while it can’t be quantified in standard terms of measurement, still should be recognized and credited in programmatic and cost-effectiveness evaluations of the architecture.

Third, the deterrent effect might be strengthened through measures, such as strategic communications, field exercises and technology demonstrations, to make clear to terrorists the obstacles they will confront in undertaking an

attack. And finally, efforts to maximize the deterrence value of the GNDA should help shape future plans and programs, increasing both its capacity to psychologically prevent attack as well as physically detect it. The detection capabilities of the GNDA can help deter as well as frustrate terrorist plans for nuclear attack. By increasing the risks that an attack will fail, and increasing the obstacles to carrying out an attack, the GNDA detection architecture can contribute to deterrence. It should not be expected to provide an ironclad deterrent; deterrence is too complex for any such sure predictions. But, in combination with the other US counterterrorism capabilities, it can make a terrorist nuclear attack less likely.

*Source: <http://www.defensenews.com>, 22 September 2014.*

## **NUCLEAR SAFETY**

### **ALGERIA**

#### **Algeria Committed to Strengthening Internal System of Nuclear Safety**

Algeria is committed in a process meant to strengthen its domestic nuclear security system, minister of Energy, Youcef Yousfi said in his address at the 58th General Conference of the IAEA. Yousfi said that "Algeria ... is also working "in cooperation with the IAEA to finalize the integrated support for national nuclear security", noting that Algeria has ratified all instruments related to nuclear safety.

In the same time, he highlighted "all the importance of universal adherence to all of these international legal instruments," the statement said. Yousfi, the head of the Algerian delegation at the international conference (22-26 September), recalled that Algeria already set up a training centre and support for nuclear safety while the penal code was amended "to criminalize the malicious use of radioactive materials and

nuclear terrorism." He stressed "the importance of 2012/2017 national framework program as a tool" for further technical cooperation with the Agency and stated that "the rate of implementation of projects in 2013 exceeded 80%." ...

*Source: <http://allafrica.com>, 24 September 2014.*

### **JORDAN**

#### **Jordan is Committed to Nuclear Safety and Security Criteria**

The chairman of the JAEA, Khaled Toukan, said that Jordan has chosen a site near Qusayr Amra, east of Amman, to construct the country's first nuclear reactor, adding that preparations are underway to study the technical features of the site and the environmental impact of the project. Delivering a speech for the country at the 58th Regular Session of the IAEA General Conference, currently being held in the Austrian capital Vienna, Toukan voiced Jordan's full commitment to nuclear safety criteria as well as its keenness to preserve the environment.

He urged all regional countries, including Israel, to join the Treaty on the NPT as this would contribute towards ushering in world peace and security and encourage regional countries to focus on economic and social development of their people. The JAEA chairman praised the role of the IAEA in boosting international cooperation to find practical and scientific solutions to developmental challenges facing the world. He also thanked the IAEA for its support to Jordan and for reviewing the Kingdom's progress in developing nuclear power programme.

On the sidelines of the 58th session of the IAEA, the JAEA signed a two-year agreement with the Rosatom to develop Jordan's nuclear plant. On the sidelines of the meeting, Toukan also met with Director General of Rosatom, Sergey Kirienko, and discussed issues pertaining to Jordan's nuclear program. He also met with the IAEA's Yukiya

Amano and other officials and briefed them about the Kingdom's nuclear program.

*Source: <http://www.petra.gov.jo>, 25 September 2014.*

## **SOUTH AFRICA**

### **South Africa Signs Nuclear Safety Deals**

South Africa concluded several bilateral co-operation agreements on nuclear safety during a conference in Austria, the National Nuclear Regulator of South Africa said on 25 September. A new agreement was signed with the Radiation and Nuclear Safety Authority of Finland, while agreements with the UK Office of Nuclear Regulation and the US Regulators Commission were renewed. ... The agreements were signed on the sidelines of the IAEA's 58th conference in Vienna, Austria. ... Bilateral discussions were being convened with the NNR's counterparts in Canada, China, and Sweden.

*Source: <http://citizen.co.za>, 25 September 2014.*

## **NUCLEARWASTE MANAGEMENT**

### **UAE**

#### **UAE Looks to other Nations for Nuclear Waste Disposal Options**

The UAE is looking at different options, including building an underground facility, to manage and dispose of the radioactive waste from the nuclear power plants it will open in Barakah. The country took part in the IAEA's scientific forum on radioactive waste management on 23<sup>rd</sup> September to learn from nations that are already advanced in the field, such as France, Sweden and Finland,

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to ensure it applies the best model for its nuclear programme.

... Since the establishment of the UAE's nuclear power programme, the country has set a policy to develop a strategy for the management and disposal of nuclear waste. "It's part of the planning process and part of the responsible approach the UAE has taken," Mr Alkaabi said. "Since then, it has adopted a few elements in relation to waste management, including regulation in the safe management of waste and engaging in many international activities in this area. ... The country is closely following other players that have already started the process of building a repository. ... The building of a geological repository in the UAE is being evaluated with the help of international experts for the development of

a national policy. ...

*Source: <http://www.thenational.ae>, 23 September 2014.*

### **USA**

#### **Second Container Possibly Leaked at New Mexico Nuclear Dump**

A second container of plutonium-contaminated debris may have contributed to a radiation leak that has led to the indefinite suspension of operations at an underground nuclear waste dump in New Mexico, a US Energy Department official said. Preliminary findings from an investigation of a Feb. 14 accident at the Waste Isolation Pilot Plant near Carlsbad that sent high levels of radiation into a salt mine half a mile (0.8 km) below ground where nuclear waste is stored suggested the culprit was a single ruptured barrel that

originated from Los Alamos National Laboratory near Santa Fe.

"What has come out insinuates we have another potential drum," Joe Franco, manager of the Energy Department field office in Carlsbad that oversees the plant, told an evening public meeting. Franco said further investigation of the underground suggests the rupture of an additional barrel of nuclear waste deposited in a separate waste panel. Early findings in a probe of the mishap

indicate at least one barrel of waste whose contents included nitrate salts, organic matter and lead underwent a chemical reaction generating heat and ruptured the container. It may be years before the dump in the Chihuahuan Desert of southeastern New Mexico is fully operational, Energy Department officials have said.

*Source: <http://www.businessinsider.com>, 18 September 2014.*



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Centre for Air Power Studies

P-284

Arjan Path, Subroto Park,

New Delhi - 110010

Tel.: +91 - 11 - 25699131/32

Fax: +91 - 11 - 25682533

Email: [capsnetdroff@gmail.com](mailto:capsnetdroff@gmail.com), [diroffice@aerospaceindia.org](mailto:diroffice@aerospaceindia.org)

Website: [www.capsindia.org](http://www.capsindia.org)

**Edited by: Director General, CAPS**

**Editorial Team: Dr. Sitakanta Mishra, Hina Pandey, Arjun Subramanian P, Chandra Rekha, Debalina Ghoshal**

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