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OPINION – Manpreet Sethi

Preparing for Radiological Emergencies and Terrorism

India is still coming to terms with the aftermath of the terrorist attack on an army camp at Uri. More names have been added to the long list of Indians who have died in incidents that have been conceived and executed with the support of elements in the 'deep state' of Pakistan. Given that Rawalpindi shows no inclination to abandon its strategy of inflicting terror on India, one cannot but be prepared to handle acts of terrorism that may breach new thresholds in the future. Preparedness and response for a radiological emergency is, therefore, a task that the country must plan for.

A news item in the *Times of India* of 22 August 2016 reported the conduct of a mock drill to rehearse Indian preparedness for a radiological emergency at an airport. The news was welcome for two reasons. Firstly, reportage of such exercises helps reassure the public that the relevant agencies are duly practicing preparedness to handle such emergencies. This also has an impact on restoring public confidence in nuclear power in general, which was badly shaken by the Fukushima episode of 2011. Secondly, the handling of an off-site radiological emergency involves the

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coordinated participation of a number of stakeholders. 20 agencies reportedly participated in the exercise. It is only through periodically repeated drills that requisite rapport and confidence in joint operations of this nature can be built.

It is natural that emergency preparedness and response strategies (EPRs) are relatively better evolved and comparatively easier to execute when a nuclear emergency is confined to the nuclear plant or site. Such crises primarily involve quick handling by the operating staff who are better equipped with technical knowledge and also more familiar with and better trained to abide

by stringent SOPs that must be followed in crisis. It is only in case of a severe accident at plant site that other civilian agencies need to be included in consequence management.

In contrast, in case of off-site, radiological emergencies that could happen anywhere, the involvement of the public necessarily requires the participation of many governmental and non-governmental agencies for crisis management. Some places likely to face such events are predictable, such as where radiological sources are in use – hospitals, industries, etc. But, discovery of stolen or maliciously use of orphan sources or acts of radiological terrorism through dirty bombs could occur anywhere. Emergency preparedness in such cases requires a very high level of quick detection, assessment and response from both nuclear and non-nuclear administrations.

Cooperation among many national and international stakeholders is a necessity in case of a radiological emergency. Law and order agencies, fire fighting and medical services, traffic officials and first responders designated by the NDMA must all be part of the team to quickly bring the situation under control. Above all, an effective public communication strategy must be available to use the media as a friend rather than letting it give its own spin to the crisis. Relationships built with press and local populace during moments of quiet would go a long way in communicating credibly and with confidence in times of crisis.

Over the years, India has judiciously invested in building organisational and technological

expertise in EPR. The NDMA has published elaborate and precise guidelines for dealing with such emergencies. BARC has developed and employs sophisticated tools to cater for quick detection, impact assessment and response. BARC has developed special mobile and fixed monitoring equipment that can be used for detection of radioactivity and identification of contaminated areas which can assist in correct movement of the responders and evacuees. At the second level, integrated assessment software is able to predict a rapid evaluation of damage from blast, fires etc and thereby help allocate medical, fire-fighting facilities etc. Most importantly, a software tool such as the geographical information system (GIS) provides maps of areas with location of roads, buildings, hospitals, etc in order to help plan routes of evacuation or influx of responders.

However, even the best laid out plans and available technological tools can be stymied if a few common-sense issues are not adequately addressed. The first of these is the prime requirement of inter-agency cooperation. Given the involvement of varied types of responders, not all of whom have radiological emergency as their daily top-most priority, it is quite likely that each would have a different understanding or level of commitment to participation in collaborative mock drills. Caught with usual manpower and resource shortages, over-burdened services are likely to accord less priority to an event that is seen as of low probability. However, the

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high consequence potential of such an occurrence is the precise reason that demands the highest attention. Conduct of mock drills must be undertaken in the spirit of joint planning for an operation and there should be adequate mechanisms for feedback assimilation to effectuate improvements.

2016 has seen a rise in terrorist incidents across the world. Vulnerabilities of regions once thought to be immune to such risks stand exposed as the US and countries in Europe and Asia have undergone such strikes. Each has struggled to minimise risks as well as improve consequence mitigation. Fortunately, no act of nuclear or radiological terrorism has yet been experienced. But there is no doubt that a radiological emergency would be a mammoth operation of managing not only the physical safety and movement of the public but also involve dealing with many psychosomatic issues.

The psychological impact of an act of radiological terrorism would in fact invoke greater damage than any real threat from radioactivity. It is for this reason that dirty bombs are described as weapons of mass disruption since they would cause greater panic, at the physical, socio-economic and psychological levels. Being neighbours with a country which is not only the fountainhead of terrorism but is also flush with fissile material, a radiological emergency is a threat for India. Well planned and regularly rehearsed EPR strategies, which include education of the public, must be accorded due priority as one important plank of addressing this threat perception.

Source: <http://www.ipcs.org/>, 23 September 2016.

OPINION – Kazumi Matsui

It's Time to Ban and Eliminate Nuclear Weapons

Being neighbours with a country which is not only the fountainhead of terrorism but is also flush with fissile material, a radiological emergency is a threat for India. Well planned and regularly rehearsed EPR strategies, which include education of the public, must be accorded due priority as one important plank of addressing this threat perception.

More than 15,000 nuclear weapons, most an order of magnitude more powerful than the bombs that devastated Hiroshima and Nagasaki, continue to pose an intolerable threat to humanity. Not only that, but all of the nuclear-armed nations are modernizing their arsenals with plans to maintain them for the foreseeable future.

...The August 1945 atomic bombings of Hiroshima and Nagasaki incinerated tens of thousands of children, the elderly, women, and men in an instant, with their fierce heat rays, blast, and radiation. By the end of that year, more than 210,000 people were dead. Among them were many Koreans, as well as international

students from China and Southeast Asia, and American prisoners of war. Nuclear weapons are indiscriminate weapons of mass destruction. Even today, 71 years after the atomic bombings, the *hibakusha* and their families continue to suffer physical, psychological, and sociological effects of the bombings.

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devastated Hiroshima and Nagasaki, continue to pose an intolerable threat to humanity. Not only that, but all of the nuclear-armed nations are modernizing their arsenals with plans to maintain them for the foreseeable future. As global awareness of the humanitarian consequences of nuclear weapons

expands, the international community has also learned through a series of international conferences that the risks of inadvertent nuclear weapons use due to accident or miscalculation are quite high. And we cannot ignore the possibility of nuclear terrorism.

As a result, more members of the international community, especially those of non-nuclear-armed states, have started paying attention to the firsthand experiences of the Hiroshima and

Nagasaki *hibakusha*, and have developed a keen awareness that they themselves could become victims of nuclear detonations caused by accident or miscalculation, if not by a limited or all-out nuclear war. In response to this shared awareness and these growing concerns, the UN earlier this 2016 convened an Open-Ended Working Group (OEWG), open to all UN member states, to develop proposals to take forward multilateral nuclear disarmament negotiations for the achievement and maintenance of a world without nuclear weapons. The OEWG met three times in Geneva....

International security still depends on the threatened use of nuclear weapons as prescribed by the doctrine of “nuclear deterrence”—a notion based on mutual distrust and the unspeakable horror the term implies. However, this theory’s power exists only in the minds of its policy-makers. Not only does nuclear deterrence offer no effective solution to the global security challenges

International security still depends on the threatened use of nuclear weapons as prescribed by the doctrine of “nuclear deterrence”—a notion based on mutual distrust and the unspeakable horror the term implies. However, this theory’s power exists only in the minds of its policy-makers. Not only does nuclear deterrence offer no effective solution to the global security challenges we face, nuclear weapons are useless both in preventing and responding to terrorism—rather, their very existence brings new risks of use each day.

we face, nuclear weapons are useless both in preventing and responding to terrorism—rather, their very existence brings new risks of use each day. In order to address emerging challenges, world leaders must solidify their commitment to seek security without relying on nuclear weapons, with a sense of urgency based on a deep understanding that people at the grassroots level expect them to do so. Along the way, these leaders will also come to understand that the wider international community places great emphasis on uniting through a growing awareness that we all belong to the same human family.

It is time for the policy-makers of the world to change their perspective and exercise the decisive leadership required for the prohibition of nuclear weapons. It is only with such decisiveness that nuclear disarmament and non-proliferation initiatives can be accelerated... . A growing

number of policymakers are visiting the A-bombed cities of Hiroshima and Nagasaki in response to the persistent call of Mayors for Peace and *hibakusha* to do so. On May 27, President Obama visited Hiroshima where he called for a “world without nuclear weapons” and declared: “[A]mong those nations like my own that hold nuclear stockpiles, we must have the courage to escape the logic of fear, and pursue a world without them.”

Regrettably, none of the nuclear-armed states took part in the OEWG. However, in August the nearly 100 participating states adopted a final report with recommendations that will be forwarded to the UNGA for action this fall. These recommendations include pursuing additional efforts to elaborate concrete effective legal measures, legal provisions and norms that will be needed to attain and maintain a world without nuclear weapons, and implementing various

measures relating to reducing and eliminating the risks of nuclear-weapons use, enhancing transparency about nuclear weapons, and increasing awareness of the humanitarian consequences of nuclear weapons. In addition, the working group, with “widespread support,” called on the UNGA “to convene a conference in 2017, open to all States, with the participation and contribution of international organizations and civil society, to negotiate a legally-binding instrument to prohibit nuclear weapons, leading to their elimination.”

Mayors for Peace welcomes the outcome of the OEWG, in particular its clear mandate for the commencement of negotiations in 2017 on a treaty to ban nuclear weapons. While we understand that the nuclear-armed states and states under their “nuclear umbrellas” oppose starting these negotiations, the serious sense of

crisis shared by the majority of the international community must not be neglected. When government representatives gather at the UNGA's First Committee to consider the recommendations of the OWEG, they must engage in cooperative dialogue, overcome their political and ideological differences, and bring us closer to achieving a world without nuclear weapons. We especially expect the nuclear-armed states and their allies to take innovative approaches and demonstrate decisive leadership.

Mayors for Peace, with a wide range of civil-society partners, wholeheartedly supports initiatives by world leaders to develop a new global security paradigm based on dialogue, mutual understanding, and cooperation, instead of doomsday threats. We will also intensify our efforts to promote such understanding and cooperation within international society. Now is the time for state and city governments, as well as diverse civil-society actors, to consolidate their efforts and promote the legal prohibition of nuclear weapons, leading towards their total elimination.

Source: Kazumi Matsui is the Mayor of Hiroshima and the President of Mayors for Peace. www.thenation.com, 26 September 2016.

OPINION – Madhav Nalapat

North Korea's Bomb Made in Pakistan

Both the nuclear explosions that took place in North Korea this year are "made in Pakistan", according to those silently, and in total secrecy, tracking the nuclear trajectory of the East Asian country. "Silently" because most governments are chary of publicly naming and presumably shaming the military establishment in Pakistan for its drive to weaponise the country's nuclear deterrent. Cooperation in the development of nuclear

weapons between Pakistan and the DPRK has been ongoing since the 1970s, but accelerated some years after the 1998 Chagai tests by Pakistan. "By end-2005, it was clear that testing of nuclear devices through computer modelling was not yielding operationally significant results", a key analyst based mainly in Hong Kong claimed, adding that from then onwards, a hyper secretive programme of cooperation between the DPRK military and the Pakistan army was begun. In both countries, the men in uniform control the development and production of nuclear devices.

The October 2006 and May 2009 North Korean tests took place with regular participation of scientists from a secret nuclear weapons development facility near Hyderabad (Sindh) in Pakistan, the sources asserted. They said that "the Pakistan army has so far done brilliantly what they are expert at, which is bluff", in that they hyped the degree to which Pakistan had proceeded on the road towards a weaponised nuclear deterrent and attack system. "When A.Q. Khan gave his 1987 interview to

Nayar about Pakistan having the bomb, they had nothing to show for their pains except a few lumps of radioactive material." However, "subsequently they received assistance from a member of the UNP-5 to launch them on the path towards developing nuclear weapons. However, such assistance was almost totally cut off after the 1998 tests," thereby forcing Pakistan to conduct further tests in the laboratory rather than underground. After six years, the results of such tests were meagre, although externally, the spin given was that the military establishment in Pakistan had perfected a nuclear weapon and indeed had more such items in stock than India.

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from the 1974 Pokhran tests, concentrated on rolling back the Indian nuclear programme.... The aim was to persuade India that there was an equivalence of nuclear terror between Delhi and Islamabad, thereby (it was calculated) making it more likely that India would undertake reciprocal actions in downsizing its nuclear weapons programme.... The Pakistan army has, on the contrary, opted to take the field testing route for its nuclear weapons programme, except that "such tests are being conducted by North Korea, with the results being made available to the Pakistan side almost instantaneously".

The sources warn that the covert collaboration between North Korea and Pakistan is geared on the Pakistan side towards developing a tactical nuclear weapon, and on the North Korean side towards producing a nuclear device that could be married to a North Korean missile capable of entering the airspace of the continental US.... Because of external assistance as well as domestic expertise, the missile programme in Pakistan, which is centred in a secret facility near Bahawalpur, has developed a level of sophistication that has yet to be matched by the nuclear weapons programme. These sources expect that North Korea will conduct "at least a half dozen more tests" as "the calculation by both sides is that these will be required to ensure a reliable nuclear weapons system that could, with small modifications, be entered into the armoury of both states."

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By 2023 at the latest and 2021 more likely, the DPRK and Pakistan would each have a "fully functional nuclear weapons stockpile together with reliable means of delivery". They were pessimistic about the international community having the will to ensure that effective steps be taken (such as through blockade and inspection of both countries including overland routes through China) to freeze and afterwards roll back the joint programme of the North Korean and Pakistan militaries to develop and deploy nuclear weapons that would include battlefield variants.

"The Pakistan army sees the development and deployment of tactical nuclear weapons as being sufficient to permanently deter India from launching a conventional war on its territory", a source based in a European capital revealed, adding that "at present Pakistan is years away from actually inducting such weapons, which is why they are going the North Korea route towards developing them". Another source added that "there is no substitute for field data, and unless India manages to persuade the US to share some of its field data on

nuclear tests, the (Indian) deterrent will continue to be less than fully reliable in battlefield conditions". These sources claimed that although India is significantly more advanced than Pakistan in the nuclear weapons trajectory, "as yet tactical nuclear devices have not been perfected" by this country, a lack the cause for which they assign to the unpublicised limitations placed on the nuclear weapons programme by the Vajpayee government – constraints that were added on to by Manmohan Singh, especially after his 2005 agreement with W. Bush on nuclear matters". It would appear that it was the Bush-Singh understanding which helped to motivate the Pakistan army to launch a programme of conducting nuclear tests through North Korea.

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Source: <http://www.sundayguardianlive.com/>, 25 September 2016.

OPINION – Hussain H Zaidi

Washington's Dilemma

Should we shun them? Should we continue engaging them? Should we go harder or softer on them? Should we rely more on the carrot or on the stick? Should we cut or increase bilateral assistance to them. Should the conditions for capital inflows be made more stringent? Such are the questions agitating the minds of American

policymakers and intelligentsia as Washington seeks to redefine its relations with Islamabad – a major non-NATO ally as well as a strategic partner. Over the years, Washington has made no bones about its distrust of Islamabad, especially the latter's counterterrorism credentials. At the same time, a few deem it to be a wiser course of action for the US to leave Pakistan entirely to its own. In Americans' eye, at its worst, Islamabad is an errant boy in the comity of nations whom they can turn their back on only at their own peril. At its best, Pakistan, the sixth largest nation in the world, the second largest state in South Asia and the only Muslim country which is a nuclear power, is too important a country to be ignored, let alone abandoned.

This dilemma was laid bare at a recent hearing of the Senate's Foreign Relations Committee on Pak-

US relations held in Washington. Disillusionment with Pakistan was expressed in so many words for the 'lack of cooperation' in putting down the Taliban insurgency in Afghanistan. The pros and cons of going tougher on Islamabad through measures such as declaring it a state sponsor of terrorism, slapping it with sanctions yet again and cutting off all economic and security related assistance were discussed. At the same time, the policymakers were warned that pushing Pakistan to the wall might backfire, thus impairing rather than serving US interests in the region. It was also pointed out that putting curbs on Islamabad or toning up aid conditionality had turned out to be

of little avail in the past. Probably the best course of action would be to continue the current engagement with Pakistan: giving it economic assistance and asking it to do more.

That Washington faces a policy dilemma on its ties with Islamabad is hardly surprisingly. Pak-US relations are driven by both mutual dependence and distrust. For over a decade-and-a-half, the US has

looked upon Pakistan as an indispensable player to achieve one of its foremost national security policy objectives: "to disrupt, dismantle and defeat Al-Qaeda and its affiliates" as outlined in the first NSS of the Obama administration. Pakistan offered the most economical conduit for transit of cargo to International Security Assistance Force (ISAF), which was overwhelmingly drawn from the US, in Afghanistan. In return, Pakistan has been given \$19 billion assistance – \$11 billion humanitarian and economic and \$9 billion security related – since 9/11. On its part, Islamabad has relied on capital inflows from Washington to keep the wheels of its economy moving and to fight the militancy. American money and expertise have come handy in pushing up development efforts in cash-starved Pakistan, particularly in grappling with the energy crisis.

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This mutual dependence has not been without its flip side. When a politically instable and economically vulnerable country like Pakistan is so important for securing key policy objectives of a military and economic superpower like the US, the logical result is increased engagement between the two. This engagement can take various forms including playing on economic and security assistance, the incessant pressure to do more, intervention in domestic affairs and – if required – violation of national sovereignty.... The US has been suspicious of Pakistan's counterterrorism role, accusing it of hunting with the hounds and running with the hare. The fact that Osama bin Laden had been in hiding in Pakistan for years before he was killed (May 2011) by US marines only lent credence to such suspicion.... Many a mover and shaker in Washington believes that Pakistan does not deserve US assistance, particularly security related assistance. Recently Congress shot down a proposal from the executive to allow Pakistan to purchase a few F16 aircraft using American money.

Washington has never approved of Islamabad's nuclear programme and would like to see it rolled back or capped. Islamabad, on the other hand, has so far resisted all attempts at making it dance to American tunes. Even when the bilateral relations were at their high water mark, the Americans remained oblivious of Pakistan's major demands, which included: (a) civilian nuclear cooperation similar to that between India and the US; (b) American mediation to help resolve the Kashmir problem; and (c) enhanced market access to Pakistan's exports.

Then there is the nuclear issue. When Pakistan went nuclear in 1998, the US slapped sanctions on the country. From then onward, Washington saw Islamabad exclusively through the prism of non-proliferation. However, the sanctions didn't deter Pakistan from going ahead with its nuclear programme. Then the fateful events of 9/11 came about and Pakistan became an American ally overnight. The sanctions were lifted and the non-proliferation issue was placed on the back burner.

The US is still engaged in Afghanistan. However, the focal point of global terrorism has shifted to the Middle East. The non-proliferation issue is back. Washington has never approved of Islamabad's nuclear programme and would like

to see it rolled back or capped. Islamabad, on the other hand, has so far resisted all attempts at making it dance to American tunes. Even when the bilateral relations were at their high water mark, the Americans remained oblivious of Pakistan's major demands, which included: (a) civilian nuclear cooperation similar to that between India and the US; (b) American mediation to help resolve the Kashmir problem; and (c) enhanced market access to Pakistan's exports.

Regarding the transfer of civil nuclear technology to Pakistan, Washington is of the view that an agreement to that effect would confer legitimacy on Islamabad as a nuclear power. True, Washington has a similar agreement with New Delhi, another de facto nuclear power. But then the Americans suspect that Pakistan does not have a clean record in nuclear non-proliferation. Contrary to the US's expectation that by using carrot (aid) and stick (conditionality), it can macro-manage Pakistan, the country has not proved to be a pushover. On both the key issues – the war on

terror and the nuclear programme – Pakistan has struck out on its own. Failure to appreciate that Islamabad will be guided by its perceived national interest has been the fundamental weakness of Washington's policy. Whether the policy will change, and in which direction, under the upcoming administration is anybody's guess.

Source: www.thenews.com.pk, 25 September 2016.

OPINION – The Economist

A Glowing Future

Upon learning (via a terse government statement) that their bustling port city in eastern China had been tipped as the likely site of a plant to recycle used nuclear fuel, residents of Lianyungang took to the streets in August in their thousands. Police,

whose warnings against demonstrations were ignored, deployed with riot gear in large numbers but only scuffled with the protesters, who rallied, chanted and waved banners in the city centre for several days. "No one consulted us about this," says one woman who participated in the protests. "We love our city. We have very little pollution and we don't want a nuclear-fuel plant anywhere near us. The government says it is totally safe, but how can they be sure? How can we believe them?" she asks.

China started its first nuclear plant in 1994. There are now 36 reactors in operation, and another 20 under construction. A further four have been approved, and many more are in the planning stages. Only one new plant has been built in America, in contrast, since 1994; four more are under construction. By 2030 China is projected to get 9% of its power from nuclear, up from 2% in 2012. In absolute terms, its nuclear generation capacity will have increased eightfold over the same period, to 750 billion kilowatt-hours a year, roughly America's current level.

Such scepticism is shared by many in Lianyungang, which already hosts a nuclear-power plant, and elsewhere in China, where the government plans to expand nuclear power massively. China started its first nuclear plant in 1994. There are now 36 reactors in operation, and another 20 under construction. A further four have been approved, and many more are in the planning stages. Only one new plant has been built in America, in contrast, since 1994; four more are under construction. By 2030 China is projected to get 9% of its power from nuclear, up from 2% in 2012. In absolute terms, its nuclear generation capacity will have increased eightfold over the same period, to 750 billion kilowatt-hours a year, roughly America's current level.

After disaster struck Japan's Fukushima nuclear power station in 2011, the Chinese authorities briefly halted this pell-mell rush toward the nuclear future, announcing a moratorium on the construction of new plants, urgent safety checks on existing ones and a prolonged policy review to decide whether

nuclear power would remain a part of China's energy strategy. The following 2012, however, the government resolved to carry on with its nuclear-energy programme. The need is clear. Despite slowing economic growth, energy consumption per person is projected to rise dramatically, with no plateau in sight before 2030. Pollution from coal-fired power plants, China's main source of electricity, causes widespread respiratory disease and many premature deaths each year, a source of persistent public anger. China has also made ambitious promises to reduce greenhouse-gas emissions....

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China's utilities are also keen. The state-owned firms that run all the country's nuclear plants are thought to earn a good return on their investment (their accounts are too murky to be certain), in part because their official backing allows them to finance new reactors very cheaply, and in part because regulators have fixed power tariffs in a favourable manner. One estimate put the return on nuclear assets between 2002 and 2012 at 7% a year, compared with 3% for coal- and gas-fired plants. China even harbours ambitions to export its growing expertise in nuclear power. After relying first on Russian designs, and more recently importing American and French ones, China has also developed indigenous nuclear reactors. A recently approved deal with Britain, valued at \$23 billion, will see China help finance a French-designed nuclear-power station and possibly build one of its own designs later.

But China's nuclear push has its critics. These include those who live near proposed nuclear facilities. Many, like the protesters in Lianyungang, are happy to have the power they need to run their air-conditioners but want to keep the unpleasant parts of the operation far from their doorsteps. Chinese now has a word for NIMBY: *linbi*, a fusion of the words for "adjacent" and "shun". The government has repeatedly backed down in the face of public demonstrations, twice agreeing to relocate a uranium-enrichment plant, for example. It has also put the decision about the reprocessing plant in Lianyungang on hold. Yet attitudes to nuclear power may be less hostile than in many Western countries. A study published in 2013 found an even split between supporters and opponents of expanding China's nuclear-power industry. Compared with their counterparts in the rich world, Chinese citizens showed much greater "trust and confidence in the government" as the manager of nuclear policy and operations, the emergency responder in case of accidents and the provider of reliable information about the industry...

It appears this message is getting through. Early this 2016 the government acknowledged in a white paper that its system for responding to a nuclear accident had "certain inadequacies". In April officials revealed plans to draft a national nuclear-safety law. In May officials announced 600m yuan (\$91m) in funding for six new nuclear-emergency squads, which would be ready for action by 2018. In August—on the same day that protesters marched in Lianyungang—China conducted its first "comprehensive nuclear-security emergency drill". ... The government said officials must consult locals before settling the location of new nuclear facilities.

...China's nuclear-power industry is centrally run and limited to a handful of companies, authorities are able to keep tight control over safety standards, and that they have not hesitated to slow projects down when seeing signs of strain. Supervision, however, falls to several different agencies and levels of the bureaucracy.... In July *China Energy News*, a newspaper, reported that "quality problems" with domestically

manufactured pump-valves were forcing some plants to shut down unexpectedly. (Most plants have since switched to imported valves.) More alarmingly, regulators in September revealed that a radiation-monitoring system at the Daya Bay nuclear-power station, which is within 50km of the huge cities of Shenzhen and Hong Kong, had been turned off inadvertently for three months before anyone noticed. Since no radiation leaked, the government deemed the oversight an event of "no safety significance"—one of several such lapses this 2016. The residents of Shenzhen and Hong Kong, presumably, would not see it in quite the same way.

Source: <http://www.economist.com/>, 24 September 2016.

NUCLEAR STRATEGY

RUSSIA

Russian Westernmost Strategic Missile Forces' Division to Receive Yars Missiles

RS-24 Yars (NATO reporting name SS-27 Mod 2) carries ICBMs with multiple independently targetable nuclear warheads and has a range of 11,000 kilometers (some 6,800 miles.) "The westernmost division of Russian Strategic Missile Forces, which is located in Tver Region will start to be rearmed with Yars missile systems," Russian Defense Ministry said in a statement, citing SMF Commander Col. Gen. Sergey Karakayev. The statement added that the division would be the sixth mobile missile unit, in which the new ICBM would replace the Topol ICBM systems.

Source: <https://sputniknews.com/>, 20 September 2016.

RUSSIA-USA

Russia Calls on US to Stop Militarizing Northeast Asia

Russian FM Lavrov has warned the US against the huge militarization of Northeast Asia, calling on Washington to stop using the threat of an alleged attack by North Korea "as a pretext" to deploy an advanced missile system in South Korea. "It is

inadmissible to use this situation as a pretext for the massive militarization of Northeast Asia and deployment of another position area for US global missile defense systems," he said while addressing the 71st session of the UNGA in New York on 23 September 2016. "All sides must refrain from further escalation of tension and embark on the way toward politico-diplomatic settlement of the nuclear problem of the Korean Peninsula through the resumption of Six-Party talks," Lavrov added. ...

Pyongyang has pledged to develop a nuclear arsenal in a bid to protect itself from the US military, which occasionally deploys nuclear-powered warships and aircraft capable of carrying atomic weapons in the region. These activities have concerned Seoul, a US ally, the most and prompted it to consent to the controversial deployment of the US THAAD system on its soil to further complicate the already volatile situation in the Korean Peninsula. The system, which has angered the North, will be installed by the end of 2017 to defend the South against nuclear and missile threats from North Korea as Seoul and Washington claim. The purpose of the talks, in which China, Japan, North Korea, Russia, South Korea, and the US participated, was to negotiate the dismantling of North Korea's nuclear program and finding a peaceful solution to the security concerns caused by Pyongyang's nuclear activities. The UN and the West have so far imposed a raft of crippling sanctions on Pyongyang over its nuclear and missile activities, but the country says it will not give up on its nuclear "deterrence" unless Washington ends its hostile policy toward the North and dissolves the US-led command in South Korea. ...

The Russian FM also touched upon the issue of nuclear disarmament, saying the majority of

nuclear-armed countries refrain from joining disarmament agreements, with some of them even torpedoing efforts to start negotiations on creating a world free of weapons of mass destruction.

Lavrov added that the advancement toward nuclear disarmament must be made with the full consideration of the whole set of factors that affect strategic stability, including the creation of unilateral missile defense systems, placement of strategic non-nuclear strike weapons, threat of placement of weapons in outer space, inability to ensure the entry into force of the CTBT, and growing imbalance in conventional arms in Europe. He also called for drafting an international

convention for suppressing acts of chemical and biological terrorism. ...

Source: <http://www.presstv.ir/>, 23 September 2016.

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BALLISTIC MISSILE DEFENCE

INDIA

India Successfully Test-Fires Barak-8 missile

India on 20 September 2016 successfully test-fired the Barak-8 long-range surface-to-air nuclear-capable ballistic missile, jointly developed with Israel, from a defence test facility off the Odisha coast. The missile was successfully launched at around 10.15 a.m. from the Integrated Test Range (ITR) launch pad at Chandipur in Balasore district, said a defence official. President Mukherjee congratulated the DRDO for the successful launch.... The DRDO is planning some more tests shortly, the official said. The advanced missile has been designed and developed by the DRDO and Israel Aerospace Industries and Israel's Administration for the Development of Weapons and Technological Infrastructure. The Long-Range

Surface-to-Air Missile (LR-SAM) has the ability to hit targets within radii of 70 km to 90 km. It is designed to defend against any airborne threat, apart from aircraft and helicopters, and can also intercept supersonic aircraft and missiles.

The missile weighs around 2.7 tonnes and is 4.5 metres in length. The district administration had temporarily shifted over 3,500 people living within a 2.5 km radius of the test facility. Barak-8 is based on the original Barak-1 missile but has a more advanced target-seeker. The radar system provides 360-degree coverage and the missile can take down an incoming missile as close as 500 meters away from a ship. Each Barak system, which includes missile container, radar, computers and installation, costs about \$24 million.

Source: <http://www.india.com/>, 20 September 2016.

SAUDI ARABIA–YEMEN

Saudi Forces Intercept Ballistic Missile Fired by Yemen's Houthis

Saudi air defence forces shot down a ballistic missile fired by Yemen's Houthi militia toward an air base outside the southern city of Khamees Mushait on 19 September 2016 night, the Saudi-led coalition said in a statement carried by the state news agency SPA. The Qaer-1 missile was aimed at Saudi Arabia's King Khalid Air Base, located about 60 km (40 miles) north of the Yemeni border, the Houthis announced on their official Twitter account. The Royal Saudi Air Defence Forces destroyed the missile before it could cause any damage, according to the statement by the Saudi-led coalition, which since March 2015 has been fighting the Houthis to try to restore the Saudi-backed government of exiled president Hadi. Saudi forces responded to the missile attack by attacking the launch site, the statement added.

Source: <http://uk.reuters.com/>, 19 September 2016.

NUCLEAR ENERGY

ARGENTINA

Argentina Looking Forward to Boosting Nuclear Energy Cooperation with KSA

Argentina is seeking to boost its cooperation with Saudi Arabia in the field of nuclear energy, transform the agreement signed between the two countries in 2011 on peaceful use of nuclear energy into action and work on increasing Saudi investment and trade exchange to build a promising future of bilateral strategic cooperation, according to an Argentine diplomat... Sergio said that the agreement between the two countries on using nuclear energy for peaceful purposes was signed between King Abdullah City for Atomic and Renewable Energy (KACARE) and Ministry of Federal Planning, Public Investment and Services of Argentina. The Argentine Ambassador added that his country is ready to consider this agreement one of the most important reasons to building a promising future of strategic cooperation between the two countries.

He noted the success of Guadalajara Agreement, which was signed between Brazil and Argentina for the exclusively peaceful use of nuclear energy, in addition to the establishment of the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials

(ABACC) – created to monitor the two countries' commitment to unequivocally pursuing the exclusively peaceful use of nuclear energy and to administrating the newly-created Common System for Accounting and Control of Nuclear Materials. Sergio stressed that his country puts boosting relations with Saudi Arabia at the head of its diplomatic efforts, noting that bilateral cooperation contributes to developing nuclear energy for peaceful purposes aiming at achieving technological, social and economic development.

Source: <http://english.aawsat.com/>, 22 September 2016.

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CHINA

Under Draft Rules, Nuclear Power Projects in China will Need Local Support

Nuclear developers on mainland China must seek the consent of local stakeholders before going ahead with new projects, according to draft rules published by the country's cabinet on 21 September 2016. Developers will need to assess the impact a nuclear project will have on social stability and solicit public opinion through hearings or announcements, the Legislative Affairs Office of the State Council said. The mainland is in the middle of a rapid nuclear reactor building programme and aims to have 58 GW of capacity in full commercial operation by the end of 2020, up from 30.7 GW at the end of July. But despite a strong safety record at existing plants, the government has struggled to convince the public about the safety of nuclear power. Protests in the eastern coastal city of Lianyungang in August led to the cancellation of a proposed US\$15 billion nuclear waste processing plant.

"Japan's Fukushima accident once again created doubt about the safety of nuclear power among the public, and also caused feelings of fear and opposition to occur from time to time," the Legislative Affairs Office said in a statement. It said the new draft rules would improve information disclosure and allow the public to participate more actively in the construction and supervision of nuclear projects. The Legislative Affairs Office has made the draft guidelines available to the public and will accept suggestions until October 19....

Source: <http://www.scmp.com/>, 21 September 2016.

EUROPE

Europe Needs to Revise Nuclear Strategy, Says Committee

A consultative body of the European Union has called for the European Commission to adopt a

"more comprehensive" nuclear strategy. The European Economic and Social Committee (EESC) says the commission should highlight nuclear energy's positive attributes. The European Commission is mandated by the Euratom Treaty to periodically issue a new Nuclear Illustrative Program (PINIC) to indicate targets and a program for nuclear production and the corresponding investment required. The Commission issued its latest PINIC in April this year.

The Commission forecasts that there will be a decline in EU nuclear capacity up to 2025 due to ageing reactors being retired and some member states ending or reducing their reliance on nuclear energy. With new reactors starting up and lifetime extensions of existing reactors, this trend is expected to be reversed by 2030. Nuclear capacity is likely to remain between 95 and 105 GWe by 2050, when it will account for about 20% of the EU's electricity production.

According to the EC, there are currently 129 nuclear power reactors in operation in the EU with a combined generating capacity of 120 GWe. Together they provide 27% of the bloc's electricity. However, the Commission forecasts that there will be a decline in EU nuclear capacity up to 2025 due to ageing reactors being retired and some member states ending or reducing their reliance on nuclear

energy. With new reactors starting up and lifetime extensions of existing reactors, this trend is expected to be reversed by 2030. Nuclear capacity is likely to remain between 95 and 105 GWe by 2050, when it will account for about 20% of the EU's electricity production.

Around 90% of the EU's existing reactors would be shut down by 2030 without long-term operation programs, resulting in the need to replace large amounts of capacity, the EC said. Having reviewed the PINIC, the EESC says it is calling for "substantial revisions to the communication notably to include sections on the competitiveness of nuclear power, related economic aspects, its contribution to security of supply, climate change and carbon targets, and public acceptability, liability for nuclear damages, transparency, and effective national dialogue."

The committee also suggests the Commission "takes this opportunity to propose in the PINIC a clear analytical process and methodology offering a consistent, voluntary framework for nation decision-making about the role - if any - of nuclear

power in the energy mix." It says priority should be given to improving national coordination between EU member states, improving cooperation between stakeholders, as well as greater transparency and public participation in nuclear issues. ...

The EESC raises a number of "major uncertainties", including the extent to which the Paris Agreement on climate change will be implemented; the volatility of the international market in fossil fuels; the rate at which new technologies will be applied; and even which countries will be in the EU. It also says it is uncertain how much influence the global economic outlook will have on the EU and how much of the investment required in the whole energy chain will be forthcoming. The committee's recommendations will be presented by Pierre-Jean Coulon, president of its energy and transport section, to the European Nuclear Energy Forum Plenary meeting in Bratislava in early October.

Source: World Nuclear News, 26 September 2016.

INDIA

India Seeks Loan from US for Nuclear Reactors, Snags Remain

India is negotiating with US Export-Import Bank for an \$8-9 billion loan to finance six Westinghouse Electric nuclear reactors, two sources familiar with the talks said, although a lending freeze at the trade agency threatens progress. The mega-project, the result of warming US-India ties in recent years, could open up billions of dollars of further investment in India's nuclear power sector, which was for decades shut out of the global market. India now targets a tenfold expansion in capacity to 63,000 MW by

India now targets a tenfold expansion in capacity to 63,000 MW by 2032, and US, French and Russian companies are among those chasing the business. The Westinghouse deal, however, is contingent on financing and Ex-Im cannot approve loans of more than \$10 million, owing to a row in the US Congress over board appointments stemming from a campaign by conservatives to close the government lender.

In addition to US Ex-Im, India is also seeking funding from Japan and South Korea for the reactors to be built in Kovvada.... Ex-Im had asked a South Korean export credit agency if it would be interested in partly financing the Westinghouse deal, since some of the nuclear equipment and materials are expected to come from South Korea.

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Only two of five seats on Ex-Im's board are filled and the appointment of a third director - the minimum needed to clear board decisions - is on hold due to opposition from the Senate Banking Committee Chairman, Republican

Shelby. "Financing of the reactors is the critical piece; everything is down to this," said one source involved in protracted negotiations to build the reactors in Andhra Pradesh.... Westinghouse is owned by Japan's Toshiba Corp (6502.T) but is based in the US. In addition to US Ex-Im, India is also seeking funding from Japan and South Korea for the reactors to be built in Kovvada.... Ex-Im had asked a South Korean export credit agency if it would be interested in partly financing the Westinghouse deal, since some of the nuclear equipment and

materials are expected to come from South Korea, an official at the agency with direct knowledge of the discussions told Reuters. The agency was willing to fund a part if a Korean contractor was involved, with Ex-Im providing the majority of the total, the official said. The US bank had not made any request to its Japanese counterpart to extend loans to the nuclear project in India, a source with direct knowledge said in Tokyo.

Leadership Lobby: Both US President Obama and PM Modi have been promoting the nuclear deal, which was stuck for years because of an Indian

law that made nuclear equipment suppliers liable in case of an accident, and not just the plant operators as is the global norm. India has since set up an insurance pool to indemnify suppliers, and both Westinghouse and India's state-run operator NPCIL are working to a June 2017 deadline to sign the contract laid down by Obama and Modi. ...While negotiators are unlikely to nail down a contract under Obama, who steps down in January, their challenge will be to come up with concessional financing terms that will make Westinghouse's AP1000 reactors affordable. ...Democratic lawmakers in the US Congress were pushing to include a provision in a must-pass spending measure that would lift the board quorum requirement for deals above \$10 million.

But negotiations between party leaders were dragging on and congressional aides and lobbyists said on 20 September it was unclear whether the Ex-Im provision would prove too controversial to make it into the final spending extension package, needed to avoid a government shutdown on October 1. The deal with Westinghouse would be the first since a landmark 2008 US-India nuclear pact that allowed New Delhi access to foreign technology and finance even though it has not signed the NPT and runs

an active weapons programme. Under the rules of non-proliferation, no US or Japanese firm could engage in nuclear trade with a non-signatory, but since Washington made an exception for India, Tokyo has also signalled its assent.

... India is also in talks with Russia to build four more reactors on top of the two already completed in Kudankulam in Tamil Nadu, as well as with France's EDF (EDF.PA) for the construction of six reactors of 1650 MW each in western India, which would be the world's biggest nuclear power complex. But talks with Westinghouse are more

advanced than those with the French, with the two sides aiming to sign an early works agreement in October.... A delegation from the US-based firm visited New Delhi earlier this September to finalise the pact that would include the timeline and up-front costs such as land acquisition and site preparation, said a source familiar with the matter.

Source: <http://in.reuters.com/>, 22 September 2016.

JAPAN

Reactor Restarts Pivotal to Japan's Energy Policy, says IEA

The restart of Japan's nuclear power reactors is "critical" to the success of the country's energy policy, according to the International Energy Agency (IEA). However, it says nuclear power can only be restored provided that the highest safety standards can be met and public trust regained. The IEA said Japan's energy policy has been dominated in recent years by its efforts to overcome the impact of the March 2011 earthquake and tsunami, and the subsequent accident at the Fukushima

Japan's idling of its entire fleet of nuclear power plants after the accident left a gap of some 30% in electricity supply. This gap has been filled with expensive, imported fossil fuels. By the end of 2013, import dependence had risen to 94% from 80% in 2010. Meanwhile, annual emissions of CO2 from power generation had increased by 110 million tonnes. Electricity prices increased by 16% for households and 25% for industry. By the end of 2015, just two reactors had been restarted and accounted for 0.9% of Japan's electricity generation that year, compared with nuclear's share of 25.3% in 2010.

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nuclear's share of 25.3% in 2010.

In April 2014, the government adopted the fourth Strategic Energy Plan (SEP) and, based on that plan, the Ministry of Economy, Trade and Industry prepared the 2015 Long-Term Energy Supply and Demand Outlook to 2030, which was adopted in July 2015. This outlook assumes Japan's nuclear generating capacity will partially be restored, reaching 20%-22% of electricity supply by 2030. The country also announced plans in late 2015 to reduce CO2 emissions by 26% from 2013 to 2030. In its report - titled Energy Policies of IEA Countries: Japan 2016 Review - the IEA said, "The most cost-effective way to begin implementing the SEP is to restart nuclear power generation at plants that the NRA approves to be safe." However, the IEA warns, "If nuclear power generation falls short of the 20%-22% target for 2030 in the 2015 Outlook, it would be very challenging to fill the gap with renewable energy alone."

The agency says it is important for Japan to re-establish its nuclear industry, "provided that safety is maintained at the highest standards possible". It suggests this restart not only depends on safety approvals, "but also on how effectively the critical issues related to the Fukushima Daiichi nuclear accident are addressed. These issues, it says, include the decontamination and resettlement of affected areas and "the provision of appropriate compensation for the serious disruption in the lives of large numbers of citizens". Decommissioning of the damaged plant "must also continue as a high-priority project", the IEA says.... The IEA recommends the government ensures the NRA has all the resources required to do its "vital work". This includes retaining experienced staff, recruiting new staff and providing training to maintain expertise. It also says the government should encourage "industry efforts to benefit from international assistance". The report also recommends the government

reviews the adequacy of the existing funding arrangements to cover the costs of decommissioning reactors and continue to seek "acceptable solutions and locations" for the disposal of high-level waste. To date, five Japanese reactors have been given final approval to restart, although two of these have remained offline due to a legal challenge. Another 20 reactors are moving through the restart process, which has been prioritised to bring on the most-needed reactors first, in the localities and prefectures more supportive of restart.

Source: <http://www.world-nuclear-news.org/>, 22 September 2016.

KENYA

Kenya Finalising Nuclear Energy Strategy

Kenya is finalising the process of developing a policy and strategy to address emerging issues associated with nuclear power use, Energy CS Charles Keter has said. Keter said that the country has made steadfast progress in the development of its legal and regulatory framework for the nuclear power programme. The policy is, among other things, aimed at addressing radiation safety. He said the National Energy Policy that formally introduces nuclear into the energy mix was adopted by the Cabinet in September 2015. "The Energy Bill 2016 which seeks to legislate the Nuclear Energy Programme Implementing Organisation (NEPIO), has been passed by Parliament," he said.

Keter said the accession to the Convention on Nuclear Safety is being reviewed by the Cabinet for consideration. He said efforts were being made to placing Kenya as a signatory to the Convention on Nuclear Safety adding that the country is in the process of finalising the Draft Nuclear Regulatory Bill 2016. The CS was addressing the 60th Regular Session of the General Conference

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of the International Atomic Energy Agency in Vienna, Austria. "Once the Bill is enacted, partnership with the Agency will be sought in the establishment of a strong and effective regulatory framework for Kenya's nuclear power programme," he said.

He added that the Agency conducted an Integrated Regulatory Review Service (IRRS) Mission in July 2016 and provided recommendations and suggestions, which are being implemented. Keter said Kenya recognises the role played by nuclear technology in the provision of competitive, clean and safe electricity. "Energy is an important prerequisite to achieve the long-term development agenda for the country and has been recognized as an economic driver in Kenya's development blue print." He said Kenya would continue to work closely with the agency in enabling countries to undertake objective energy planning to meet future energy requirements. Keter said the energy planning process in the country has resulted in the need for inclusion of nuclear energy in the country's energy strategy. ...

Source: <http://www.the-star.co.ke>, 27 September 2016.

UK

Brexit 'Could Trigger' UK Departure from Nuclear Energy Treaty

The UK's withdrawal from the EU could also force it to exit the Euratom Treaty on nuclear energy, ENDS has learned. The Euratom Treaty, which applies to all EU member states, seeks to promote nuclear safety standards, investment and research within the bloc. Although it is governed by EU institutions, it has retained a separate legal identity since its adoption in 1957.

Brian Curtis, a member of the European Economic and Social Committee (EESC), told ENDS that his Committee had recently consulted the European Commission on whether Brexit would automatically lead to a UK exit of Euratom. Curtis said the Commission had responded affirmatively, arguing that the Treaty of the European Union (TEU) applies to the Euratom Treaty under article 106 of the latter agreement. This would mean, it said, that the reference to 'Union' in TEU's article 50 – which needs to be invoked by member states wishing to quit the bloc – would apply not only to the EU itself but to Euratom membership as well.

A Euratom withdrawal by the UK – which recently approved the controversial £18bn Hinkley C project – could have major strategic implications for the EU nuclear sector. "But anticipating specific outcomes at this stage is problematic," the Committee added. The Commission itself would not comment on the exchange, which took place as the EESC examined the EU's latest nuclear plan.

In an attempt to abandon the use of Russian-made fuel assemblies for its nuclear power plants, Kiev has announced plans to set up the joint production of the assemblies with Kazakhstan. The only problem with the plan is that even if it buys the assembly from Kazakhstan, the enriched uranium itself will still be coming from Russia.

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Source: <https://www.theguardian.com>, 27 September 2016.

URANIUM PRODUCTION

UKRAINE

Ukraine to Abandon Russian - Made Nuclear Fuel for Russian - Sourced Nuclear Fuel

In an attempt to abandon the use of Russian-made fuel assemblies for its nuclear power plants, Kiev has announced plans to set up the joint production of the assemblies with Kazakhstan. The only problem with the plan is that even if it buys the assembly from Kazakhstan, the enriched uranium

itself will still be coming from Russia. On 21 September, Kazakh national nuclear power company Kazatomprom announced that they had reached an agreement with the Ukrainian Energy Ministry to look into the production of fuel assemblies in Kazakhstan for use by Ukraine's nuclear power plants. Kazatomprom head Zhumagaliev told Ukrainian Energy Minister Nasalikh that the company was interested in the idea, proposed by Ukraine, which would help Kazatomprom reach its strategic objective of diversifying their production. The two sides agreed to organize joint working groups to study the prospects for cooperation. The officials also discussed the possibility of Kazakhstan supplying Ukraine with enriched uranium and ion exchange resin.

At the moment, the Russian nuclear fuel cycle company TVEL supplies Ukraine's four operating nuclear power plants with the vast majority of their fuel. The remainder is supplied by Westinghouse, although Ukrainian nuclear experts

have repeatedly warned that the move to get the US company to supply Ukrainian plants was a 'political decision', and a dangerous one at that, given compatibility problems. Tvel has repeatedly emphasized that they do not have any plans to suspend their production of nuclear fuel to meet Ukraine's needs, while Ukrainian officials have made repeated assurances that they are looking to diversify away from Russian supplies. In their design, Kazakh fuel assemblies would be no little different from their Russian-made counterparts. However, according to experts, Kiev is mistaken if it thinks that switching to Kazakhstan will nullify its dependence on Russia.

...In the former Soviet space, only Russia has a well-established capability in this area. As far as Kazakhstan is concerned, Rilov noted that the country certainly has the capacity, "at its plant in Ust-Kamenogorsk, to produce fuel pellets for nuclear reactors (blocks of enriched fuel). But

the enriched material is still supplied by Russia; there are no uranium enrichment facilities anywhere else in the Commonwealth of Independent States." Accordingly, Rilov noted, getting Moscow to agree to supply enriched uranium for any Ukrainian-Kazakh project will be extremely difficult, since it would amount to undercutting Russia's own nuclear fuel industry. Even in the long term, if Kazakhstan succeeds in efforts to gain an independent capability for uranium enrichment, that success would immediately lead to censure from the International Atomic Energy Agency. "After all, only a handful of countries currently know how to enrich uranium."

It's true that some parts are made in Ukraine (for example, the turbines, made in Kharkov, and the pumps, made in Sumy). But the reactors are still Russian, along with much of the other hardware. Therefore, extending the lifespan of Ukraine's nuclear reactors is only possible together with Russia.

Effectively, the plans for a Ukrainian-Kazakh nuclear fuel project are reminiscent of Ukraine's efforts to diversify away from Russian gas supplies. After two years of trying, all Kiev managed to get was a series of agreements with European energy

companies to purchase Russian gas labeled 'European' and pumped back into Ukraine at higher prices. Ukraine's nuclear power industry uses old reactors, Rilov emphasized. "They must either be stopped or have their life extended. Extending them in accordance with global standards is possible only with direct participation from their chief designer – i.e. Russia. It's true that some parts are made in Ukraine (for example, the turbines, made in Kharkov, and the pumps, made in Sumy). But the reactors are still Russian, along with much of the other hardware. Therefore, extending the lifespan of Ukraine's nuclear reactors is only possible together with Russia." Ultimately, the expert noted, Ukraine may truly want to abandon its dependence on Russian nuclear fuel assemblies, "but prolonging their plants' dependence on their own is akin to beginning the production of BMWs at the Zaporizhia car plant."...

Source: www.sputniknews.com, 22 September 2016.

USA

Centrus Signs Contract for Advancing US Enrichment Technology

Centrus Energy Corp. (NYSE MKT: LEU) announced 22 September it has entered into a new follow-on contract with UT-Battelle, LLC, as operator of the US Department of Energy's Oak Ridge National Laboratory, for maintaining and advancing US gas centrifuge uranium enrichment technology. The contract is valued at approximately \$25 million and runs through September 30, 2017. Under the terms of the contract, Centrus will perform engineering and testing work on the American Centrifuge uranium enrichment technology to support future national security and energy security needs. ...

Under this new contract, Centrus scientists, engineers, and operators will utilize the Company's unique facilities in Oak Ridge, Tenn., to develop and test technology improvements to reduce costs, improve manufacturability, and enhance long-term reliability of US uranium enrichment technology. The work ensures that critical US expertise in centrifuge technology and operations is maintained and advanced to meet the future needs of the nation. The Company noted that, while the vast majority of its business is focused on supplying nuclear fuel to utilities through contracts with a global network of uranium enrichment producers, Centrus remains committed to its role in supporting US national interests.

National Security. The US, which once led the world in uranium enrichment, shut down the last of its outdated and increasingly uneconomical Cold War-era enrichment plants in 2013 – leaving the nation without a domestic, industrial-scale uranium enrichment capability for national

security purposes for the first time since the Manhattan Project. For commercial electricity production, the US now imports the great majority of its enriched uranium fuel from Russia, Europe, and China. While current market conditions do not support building a full-scale uranium enrichment plant for commercial purposes, over the long-term the US will need to deploy a domestic enrichment technology at industrial scale to strengthen energy security, advance US nonproliferation goals, provide fuel for the long-term needs of the nuclear Navy, and ensure a supply of tritium, which is needed to maintain the effectiveness of America's

nuclear deterrent. In October 2015, the US Department of Energy issued a report to Congress which explored a range of possible technologies and found that the American Centrifuge is the “most technically advanced and lowest risk option” for restoring America's domestic uranium enrichment capability to meet long-term national security needs. ...

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Source: <http://www.businesswire.com/>, 22 September 2016.

NUCLEAR COOPERATION

CUBA–RUSSIA

Cuba, Russia Sign Nuclear Energy Cooperation Deal

Cuba and Russia relaunched their relations with a pacific nuclear energy deal signed in Vienna alongside the IAEA General Conference. Cuban vice Minister of Science, Environment and Technology José Fidel Santana signed the deal with Sergey Kirienjo, director of the Russian state nuclear energy company Rosatom.

Santana said that, after two years of negotiations, the deal would give both countries a framework to immediately begin developing bilateral

projects, especially related to the medical and agricultural uses of nuclear energy. He insisted that the projects were still in their initial phases, so the economic and material volume of the deal could not yet be evaluated.

The deal also includes the creation of Cuban nuclear specialists, applied and fundamental investigations and the management of radioactive waste. Bilateral relations between Russia and Cuba have intensified in the last few months and they have signed several deals, including one on the sale and repair of train engines for merchandise transport on the island between 2017 and 2021.

Source: <http://latino.foxnews.com>, 27 September 2016.

UK-CHINA

British Project May Clear Way for China's Nuclear Exports to the West

There's a whole lot more in British PM May's decision to allow a Chinese company to invest in the Hinkley Point C nuclear plant than mere business. Chinese investment is limited to investing funds in the \$24 billion project, which will use two French reactors supplied by Electricity de France. But the project could clear the way for Chinese involvement in a more crucial project at Bradwell, east England, which would allow China to export its nuclear technology to the Western world, analysts say. China General Nuclear Corporation, the investor in Hinkley Point, already has signed a pre-feasibility agreement for the Bradwell project.... Only a few developing countries like Pakistan are using Chinese reactors. These countries are not known to have the kind of strict regulatory control

Only a few developing countries like Pakistan are using Chinese reactors. These countries are not known to have the kind of strict regulatory control seen in the West. The Bradwell B project could be a game changer. Getting regulatory approval in Britain for its reactors is crucial for China because it can open the doors for Chinese nuclear exports to the West.

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Hold and Release: One of May's first acts after taking over as NPT July 2015 was to halt the \$24 billion Hinkley Point project in order to review the security risks involved in the project, which was to be owned jointly by Electricity de France, or EDF, and China General Nuclear Corporation. Within weeks, she reversed the decision after meeting with Chinese President Jinping on the sidelines of the Group of 20 nations meeting in Hangzhou. The British government inserted some safety clauses

The British government inserted some safety clauses in the contract to ensure that the Chinese company does not gain majority stake, in the event of the EDF pulling out. But there's many a slip between May's lip and China's cup of hope. Britain already is in the midst of fierce debate with critics voicing concern about security issues. Critics question a provision in the contract that provides for a fixed electricity rate for 35 years at a time when energy prices are falling, and are expected to be much lower in the future.

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prices are falling, and are expected to be much lower in the future. ...

Security Fears: "It is believed that the deals could lead to the Chinese designing and constructing a third nuclear reactor at Bradwell in Essex. Security experts reported to be inside as well as outside government are worried that the Chinese could use their role to build weaknesses into computer systems that will allow them to shut down Britain's energy production at will," Timothy wrote in an article published in October 2015.... Analysts

believe May was seeking Chinese investments because of the urgent need to fill Britain's energy gap, as well as move away from polluting coal-based electricity production. But Britain's security is of critical importance to her. ... For Beijing, British approval for the Hinkley Point project is a major image booster, analysts say. Chinese business is seen in the West as an acquirer of property and trader of low-tech, unbranded goods, they point out....

Source: <http://www.voanews.com/>, 20 September 2016.

NUCLEAR PROLIFERATION

CHINA-NORTH KOREA

US Targets Chinese Company for Supporting N. Korean Nuclear Program

The US is targeting a Chinese company and the people who run it for allegedly helping North Korea with its nuclear weapons program. It closely follows the North's fifth nuclear test, which took place in September. "Each new nuclear test...spurs this kind of scramble to do something," says John Delury, a professor of international relations at Seoul's Yonsei University. "And sanctions is the kind of preferred choice."

Targeted sanctions will hit a Chinese conglomerate based on the North Korean border – Dandong Hongxiang Development Company. The US Department of the Treasury says the firm has helped sanctions-blacklisted North Korean companies procure raw materials that could be used for nuclear weapons. The same company – along with three officials and the woman who runs it, Ma Xiaohong – has also been indicted on U.S. charges it served as a front for North Korean businesses trying to bank and trade, prohibited under sanctions.

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Chinese police announced that they have launched a criminal investigation against the same company for "grave economic crimes." "This has long been a struggle, is trying to get at the most sensitive firms and the most sensitive activities, which is nuclear proliferation," says Kent Boydston, a research analyst at the Peterson Institute for International Economics. "There were other activities they were involved in trade that wouldn't necessarily be illicit trade in of itself," says Boydston. "But because these organizations, these networks, these people are so interconnected with each other, it really begs the question of: if you allow one activity that seems licit, then are you really just aiding and abetting an illicit activity?"

Stopping this particular conglomerate may plug one hole in current sanctions imposed on North Korea. But the question of whether it will effectively slow North Korea's nuclear advancement remains. Delury says this is probably too little too late. "That said, every further step [North Korea makes] worsens our security. Both Americans and South Koreans. So it doesn't mean you just throw up your hands and do nothing," Delury says. The debate continues about what to do next. One thing is clear: sanctions have not succeeded in halting North Korea's development of nuclear weapons.

Source: <http://www.npr.org/>, 27 September 2016.

NUCLEAR NON-PROLIFERATION

ARAB STATES

Arab States Shelve Push against Israel at UN Nuclear Watchdog

For the first time in three years, the Arab states will not be submitting an annual resolution at the IAEA's General Conference due to repeated lack

of success; Arab League Ambassador says Arab states are revising their tactics: 'We are not concerned with short-sighted victories.' Arab member states in the UN nuclear watchdog have shelved an annual bid to pressure Israel into accepting international scrutiny of its atomic activities pending a revamp of their tactics, a senior diplomat said. Their diplomatic strategy is shifting after previous resolutions at meetings of IAEA members failed to secure more transparency from Israel, believed to have the only atomic bombs in the Middle East. Increasingly frustrated, Arab states will not submit an Israel resolution at the IAEA's General Conference for the first time in three years, a senior Arab diplomat told Reuters.

Arab nations have been unable to push through such resolutions at the annual meeting of IAEA member states since 2013. The last time they succeeded was in 2009, but this did nothing to enhance UN monitoring of Israel's nuclear actions. Repeated Arab-sponsored attempts to organize a conference on a Middle East nuclear weapons ban have also been fruitless, with the US always standing with Israel against the move. This led Arab states to decide to stop striving for resolutions that merely call on, but do not order, Israel to implement nuclear control regimes such as the NPT or an IAEA Comprehensive Safeguards Agreement (CSA), Arab League Ambassador Assad said. Israel has never confirmed or denied having nuclear weapons under a policy of ambiguity. It is the only Middle Eastern country outside the NPT and has no CSA—the only other countries in that position being Pakistan and India.

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Source: <http://in.reuters.com/>, 21 September 2016.

AZERBAIJAN

Azerbaijan Committed to Non-Proliferation Treaty

Azerbaijan, remaining committed to the NPT of Nuclear Weapons, actively supports international efforts in this direction, Mammadyarov, Azerbaijani FM, said. Mammadyarov made a statement at the ministerial meeting of the Friends of the CTBT in New York, Trend reports.

"Azerbaijan is making contribution to the implementation of the Comprehensive Plan of Action on Iran's nuclear program," Mammadyarov said.

Source: <http://news.az/>, 22 September 2016.

GENERAL

UN Urges US, China, Others to Ratify Nuclear Test Ban Treaty

The UNSC urged China, the NPT, North Korea, Egypt, India, Iran, Israel and Pakistan to ratify a treaty banning nuclear explosions, which would allow the deal negotiated 20 years ago to come into force. More than 160 countries have ratified the 1996 CTBT. Since then India, Pakistan and North Korea have conducted nuclear tests.

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India, Pakistan and North Korea have conducted nuclear tests. This September Pyongyang conducted its fifth and largest test. The 15-member Security Council adopted a US-drafted resolution on 24 September with 14 votes in favor and an abstention by Egypt. It does not impose any legal obligations but adds political weight to the push for the treaty to be enacted.

The UN resolution calls on all states to refrain from conducting any nuclear explosions. US President Obama's administration has said it would like to ratify the treaty, but a number of US lawmakers, especially Republicans, oppose ratification of a pact they fear would limit US security options. "Our affirmative vote here is a sign of our unwavering commitment to a safer world in which nuclear technology is used solely for peaceful purposes and the risk of nuclear conflict is no more," US Secretary of State Kerry. He said the resolution does not impose a legal prohibition on testing or require governments to adopt new reporting. "But it does reinforce the core purposes and objectives of the CTBT itself: to diminish our reliance on nuclear devices, to reduce competition among nuclear powers, and to promote responsible disarmament," Kerry told the council.

UN Ambassador Churkin of Russia said Moscow hoped the next president of the NPT would be "more strident in his desire to ratify it." The NPT is due to elect a new president on Nov. 8. Obama will step down in January. Egypt's Badr, assistant FM for multilateral affairs, described the resolution as "substantively flawed and ill-suited to be addressed in the Security Council." "Its contribution to the nuclear disarmament regime is minimal and ineffective. Rather than strengthening this regime, the resolution squanders the opportunity to emphasize the urgency to advance nuclear disarmament," he told the council.

Source: <http://in.reuters.com/>, 24 September 2016.

World Failed to Pass Exam with the Budapest Memorandum

Ukrainian President Poroshenko has said that the non-fulfilment of the Budapest Memorandum is not only the defeat of Ukraine, but of the entire

democratic world too. "Let's be frank, we failed to pass exam with the Budapest memorandum. Then democratic world lost its first battle – it was not only about Ukraine, but also about credibility of agreements. However, Ukraine as a responsible international actor has always been and remains a committed advocate of nuclear non-proliferation and disarmament," President Poroshenko said at the 71st session of the UNGA in New York on 21 September 2016.

He recalled that Ukraine voluntarily dismantled its own nuclear arsenal, the third largest in the world in exchange for security, sovereignty and territorial integrity assurances under the 1994 Budapest Memorandum. "Regretfully, all these assurances remained just a piece of paper," President Poroshenko noted. Thus, timely and effective action of the international community – the Security Council in the first place – in response to the North Korean nuclear test is one

more exam for all of us, the Head of the Ukrainian state noted. "We must not allow plunging the world into a new nuclear arms race. Huge global instability and ever-growing security challenges increasingly demand strong leadership both in states and in international organizations. The UN is no exception," President Poroshenko stated.

Source: <http://www.ukrinform.net/>, 26 September 2016.

NUCLEAR DISARMAMENT

GENERAL

Security Council Adopts Resolution on Nuclear Non-Proliferation and Disarmament

Reaffirming that proliferation of weapons of mass destruction, and their means of delivery, threatens international peace and security, the UNSC on 23 September adopted a resolution urging all States

who haven't done so to sign the CTBT. With 14 votes in favour and one abstention (Egypt), the resolution welcomed progress made towards universalization of the Treaty, noting that 183 States have signed the Treaty and 166 States have deposited their instruments of ratification. The CTBT bans all nuclear explosions for both civilian and military purposes. Adopted by the UNGA under resolution 50 (1996), the Treaty will enter into force 180 days after the date of deposit of the instruments of ratification by all States listed in its Annex 2.

Speaking to the press shortly after the Council voted on the resolution, Zerbo, the Executive Secretary of the CTBTO, the Treaty's Preparatory Commission, said the organisation welcomed any initiative that serves to strengthen the norm against nuclear testing. "This is timely", said Mr. Zerbo. "This resolution is timely because it comes at a time where we celebrate the 20 years anniversary of the opening for signature, of the CTBT, but timely as well because it comes at a time where DPRK (Democratic People's Republic of Korea) has reminded the international community of the absolute necessity to get this treaty into force, by having the moratorium on nuclear testing strong and sealed," Mr. Zerbo added. He was referring to the latest incident of nuclear testing – conducted by DPRK – which was condemned by CTBTO, the UN Secretary General, the Security Council, and the IAEA.

Mr. Zerbo also noted that voting today and adopting the resolution, keeps the CTBT relevant. "We understand some of the concerns that States may have, that this does not substitute the process for ratification. The process for ratification remains the ultimate way to get the Treaty into force, but we just hope that this step – which is an important step, because after the Iran deal, this constitutes one next key element in arms

control, non-proliferation and ultimately disarmament – we hope that there will be more steps towards disarmament, because we all seek a world free of nuclear weapons at the end of the day," said Mr. Zerbo.

He however noted that the first step towards that world, is an end to nuclear testing. "A world free of nuclear weapons goes by stopping testing too, and then taking steps that will reinforce the agreements that are already here, and then leading us towards what we all want: a world free of nuclear weapons; a world free of any attempt of modernisation that some are talking about today." 23 September's resolution – adopted by the 15-member Council at a meeting on maintenance of international peace and security

– further noted that of the 44 States listed in Annex 2, 41 have signed and 36 have both signed and ratified the Treaty, including several nuclear weapons States. Of the 44 States included in Annex 2, all have signed with the exceptions of the Democratic People's Republic of Korea, India and

Pakistan. Five of the 44 Annex 2 States have signed but not ratified the Treaty: China, Egypt, Iran, Israel and the NPT.

Stressing the "vital importance and urgency" of achieving the early entry into force of the Treaty, the Security Council, by the terms of the resolution, urged all States that have either not signed or not ratified the Treaty – particularly the eight remaining Annex 2 States – to do so without further delay. Further, the Security Council called on all States to refrain from conducting any nuclear-weapon test explosion or any other nuclear explosion, and to maintain their moratoria in that regard, and to provide the required support to enable the Preparatory Commission for the CTBTO to complete all of its tasks in the most efficient and cost-effective way.

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By the text of the resolution, the Council also recognized that "even absent entry into force of the Treaty the monitoring and analytical elements of the verification regime are at the disposal of the international community in conformity with the Treaty and under the guidance of the Preparatory Commission." Such elements "contribute to regional stability as a significant confidence-building measure, and strengthen the nuclear non-proliferation and disarmament

regime," the Council said. In addition, the Council affirmed that the Treaty's entry into force will contribute to the enhancement of international peace and security through its effective prevention of the proliferation of nuclear weapons and through its contribution to nuclear disarmament.

Source: <http://www.un.org/>, 23 September 2016.

NUCLEAR TERRORISM

PAKISTAN

In Wake of Uri Terrorist Attack, Pakistan Nukes under Scrutiny

Pakistan's nuclear weapons program is coming under renewed scrutiny and pressure from the US, Japan, and other aid givers even as the country's nervous leaders are rattling their atomic arsenal, fearing retribution from India for the Uri terrorist attack. Word that US is asking Islamabad to cap its nuclear weapons program came from both Pakistani and US officials amid Pakistan's rising tensions with India and deteriorating relations with other SAARC countries and beyond.

While US officials were circumspect in saying Secretary of State Kerry "stressed the need for restraint in nuclear weapons programs," Pakistan officials, who acknowledged that Kerry

Pakistan is using the threat of an unbridled expansion of its nuclear program to seek a membership of the NSG, with a section of US domain experts arguing that may be one way to contain a runaway program. Others caution that American permissiveness is precisely what allowed Pakistan to come to this stage. But recent developments, including North Korea's ramped up nuclear program and tests, and Pakistan's own growing reputation as a terrorist hub on top of its proliferation record, is putting a crimp on Islamabad's effort to seek the kind of legitimacy India's nuclear program has.

had urged PM Sharif to "limit" Pakistan's nuclear program, bluntly said "it had been conveyed to the US Secretary of State that the proposals which were expected from Pakistan should also be implemented by India."... The Pakistani defiance came even as the country's DM Khawaja and top generals rattled their nuclear weapons in a familiar show of bravado to warn off retaliation from India for the terrorist attacks that New Delhi

says are launched from Pakistan. It renewed the long-running debate about Pakistan using its nuclear cover to initiate terror strikes on India, and the pressure on New Delhi to call Pakistan's bluff.

Separately, Pakistan is using the threat of an unbridled expansion of its nuclear program to seek a membership of the NSG, with a section of US domain experts arguing that may be one way to contain a runaway program. Others caution that American permissiveness is precisely what allowed Pakistan to come to this stage. But recent developments, including North Korea's ramped up nuclear program and tests, and Pakistan's own growing reputation as a terrorist hub on top of its proliferation record, is putting a crimp on Islamabad's effort to seek the kind of legitimacy India's nuclear program has.

On 20 September, Pakistan's PM Sharif audaciously sought Japan's support for the NSG membership even though Pakistan has posed an existential danger to Japan by proliferating nuclear technology to North Korea. ...Sharif told him that "Pakistan strongly condemns the recent nuclear tests conducted by North Korea and urges it to abide by its international treaty obligations."

Pakistan is widely credited with facilitating North Korea's nuclearisation with China's patronage and under lax American oversight, in some cases using U.S supplied C-130 transport planes for transactions with Pyongyang. The idea that Pakistan has gotten away with sponsorship of terrorism and nuclear proliferation for so long is in itself quite astonishing, but those days may be coming to an end, with even US lawmakers now saying Islamabad has overplayed its cards. On 20 September, two Republican Congressmen moved legislation to have Pakistan designated a terrorist state.

In fact, Pakistan's parlous economic condition, with steep decline in its two principal sources of revenue - remittance and exports - has put the country in a particularly vulnerable spot as US, Japan, South Korea, EU and start to mount pressure. Pakistan's response has been to run to China, Turkey, Russia, and Saudi Arabia, which, in the eyes of many Pakistani fantasists, are Islamabad's new allies because India has gotten close to US, Japan, European Union and others. ... Pakistan's foreign policy advisor Sartaj Aziz has sought out counterparts from countries such as Austria, Switzerland etc even as Islamabad's ties with India, Afghanistan, and Bangladesh deteriorate, endangering the November SAARC summit scheduled to be held in Pakistan.

In New York, Pakistan's efforts to highlight the Kashmir issue with fear-mongering and raising the nuclear stakes using the tensions over Uri attack have essentially come to nought. The international community, all too familiar with the nature of the dispute, has either ignored it, or lectured Pakistan not to provoke a confrontation. On 20 September, President Obama himself asked nations engaged in "proxy wars" to end them, warning that if communities are not allowed to

co-exist, the members of extremism will continue to burn" causing sufferings to countless human beings and export of extremism overseas. Although he did not name Pakistan, it ticked all the boxes he mentioned

Source: <http://timesofindia.indiatimes.com/>, 22 September 2016.

NUCLEAR SAFETY

BELARUS

European Commission Delegation Informed about Belarusian Nuclear Power Plant Safety

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Belarusian Deputy Minister of Foreign Affairs Kupchyna met with a delegation of the European Commission led by Deputy Director General for Energy Thomas on 19 September, the Ministry's press service told BelTA. The sides discussed topical matters and prospects of expanding cooperation between Belarus and the European Union in power engineering. The Deputy Minister of Foreign Affairs underlined the importance

of a mutual informative and transparent dialogue within the framework of implementation of the Belarusian nuclear power plant construction project. The Deputy Minister of Foreign Affairs also informed about the steps Belarus takes to ensure safety and reliability of the future nuclear power plant. She confirmed the intention of the Belarusian side to finish stress testing the power plant by the end of the year. While in Belarus the European Commission delegation will visit the construction site of the Belarusian nuclear power plant to get familiar with the progress of the project and will continue meeting with representatives of the relevant Belarusian government agencies.

Source: <http://eng.belta.by/>, 19 September 2016.

CANADA

International Nuclear Power Experts Arrive at Pickering

A team of nuclear power experts led by the IAEA has arrived at Ontario Power Generation's (OPG) Pickering Nuclear Station to conduct a standard Operational Safety Review Team (OSART) mission. "This is an important international review for OPG and Canada," said OPG's Nuclear President and Chief Nuclear Officer Jager. "This is an opportunity for us to showcase our commitment to excellence and safety, and to share best practices with these international experts." Pickering Nuclear was put forward for this review in 2014 by the Canadian Nuclear Safety Commission, Canada's independent nuclear regulator and active participant in the international nuclear community.

The OSART program has been providing member countries the opportunity to share knowledge and to support continuous improvements to their operations since 1982. Best practices identified through these reviews are shared with other nuclear operators through the IAEA. In the 2015 Nuclear Safety Report, OPG's Pickering and Darlington nuclear stations received the highest possible safety rating of "fully satisfactory" and for Darlington, it's the seventh year in a row the station has achieved this rating. Combined, the plants provide about 30 per cent of the electricity used in Ontario. OPG provides about half the power Ontario relies on. The electricity OPG produces is more than 99 per cent free of greenhouse gas emissions.

Source: <http://www.pennenergy.com/>, 19 September 2016.

NUCLEAR WASTE MANAGEMENT

FINLAND

Finnish Expert Says "Conservative" Nuke Bonanza Just the Beginning

The vast \$445 billion, 70-year windfall from a prospective nuclear waste repository outlined in the Scarce Royal Commission's final report likely underestimates the economic impact of the

project.... Finland is regarded as a world authority on the development and storage of nuclear fuel, with the royal commission interviewing several officials involved with the Onkalo facility, including Dr Hautakangas, the head of Finnish energy company Fortum's Spent Fuel and Disposal Services and an advisor to Posiva, the company constructing the repository.

...The economic benefits of the proposed waste dump have been the subject of intense debate, given Scarce's calculations will be the primary selling point if the Government commits to proceeding with further planning by year's end. Think-tank the Australia Institute released its own research in March arguing that the commission grossly exaggerated the economic benefits. But Hautakangas says: "I think that there will be definitely a market for this kind of service, no doubt." "We know there are many countries using nuclear but they are really lacking a solution for a

waste repository, [so] definitely there will a market there," he said. While Finland will store its own nuclear waste, Hautakangas says "there's quite strict regulation and legislation regarding international waste" to ensure the country doesn't export or import spent fuel, which he says would

preclude it from becoming a competitor for the world's waste.

"So this would mean if we would like to enter the market we [would have to] change the law [and] I think at this moment there's no any kind of intentions towards this kind of development," he said. He said an important factor in Finland's population finding relative consensus behind nuclear was the role of its Radiation and Nuclear Safety Authority, STUK. ...Asked about safety concerns, with the spectre of nuclear disasters looming large in the arguments against the waste dump, Hautakangas said there was "no fear at all that [SA] could have something like Fukushima or Chernobyl". "You'd never ever see anything comparable to Fukushima or Chernobyl [because] the fact is the repository won't have this kind of active nuclear material," he said.

Source: <http://indaily.com.au/>, 19 September 2016.

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USA

Vermont Yankee Gets \$143 Million Fuel Storage Project in Gear

Vermont Yankee administrators waited two years for the state's permission to build a new storage facility for nuclear waste at the defunct Vernon plant. When they finally received that permit in late June, they didn't waste any time getting started. Entergy representatives on 22 September said the construction of a spent fuel storage facility is well under way, with a few dozen contracted workers having recently installed a massive generator to provide emergency power to the complex.

Construction will continue into 2017. But officials say getting the generator in place was a major milestone as crews begin a \$143 million effort to transfer all of the plant's radioactive spent fuel into sealed casks... . Vermont Yankee stopped power production in December 2014, and all fuel was removed from the plant's reactor the following month. But the majority of those fuel assemblies — 2,996 of the 3,880 on site — remain in a cooling pool inside the reactor building. The other assemblies have been stashed in 13 "dry casks" on a concrete pad near the reactor. The state Public Service Board approved construction of that storage area in 2006.

Entergy administrators say they will need a total of 58 casks to hold all of the plant's spent fuel. So they applied in June 2014 for a state certificate of public good to build a second storage pad adjacent to the existing pad. A lengthy and sometimes contentious permit process followed. Part of the delay was at Entergy's request, as the company needed more time for engineering work. But there also were numerous objections to Entergy's plans. Some wondered whether the fuel pad's location could negatively affect the cost and

schedule for Vermont Yankee decommissioning, while others questioned the safety and visibility of the proposed storage facility.

Entergy vigorously defended its proposal, saying any attempt to relocate or redesign the spent fuel pad would take years and cost hundreds of millions of dollars. On June 17 — nearly two years after Entergy filed its petition — the Public Service Board approved Entergy's plans. Work on the fuel storage project began the following July. While Entergy is supervising, Florida-based Holtec International has been contracted to handle all aspects of the job including constructing the pad, fabricating storage casks and loading those casks on site. This September, crews installed a 200-kilowatt diesel generator that will supply backup

power to the fuel storage facility and other Vermont Yankee facilities. The generator — which sports a 1,200-gallon fuel tank, according to state documents — is expected to be operational in October.

...The concrete fuel pad — which will be 3 feet thick and measure 93 feet by 76 feet — can't be poured until crews remove an old

storage building called the North Warehouse. Given the potential for asbestos and other non-radiological waste, the warehouse work will be overseen by the state Department of Health and the state Agency of Natural Resources... The fuel pad work will continue into 2017, when Entergy expects to begin moving spent fuel from the cooling pool to dry casks. Lynch reiterated on 22 September that all fuel will be in dry cask storage by the end of 2020.

All told, the project is expected to cost \$143 million. Entergy has taken out lines of credit to cover that, and the company expects to take legal action against the federal government to try to recoup that cost. That's because federal officials have not met their legal obligation to create a

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central repository for the nation's nuclear waste. While the US Department of Energy has begun planning for the eventual removal of Vermont Yankee's spent fuel, there's not yet a place to take it.

The fuel pad project is the biggest thing happening at Vermont Yankee at the moment. By the end of June, Entergy had finished draining and "laying up" plant systems that are no longer needed, Lynch told the advisory panel. Administrators are still shutting down buildings at the plant site. "We've been consolidating our staffing and use of those buildings so that we can remove services and power," Lynch said. "The obvious reason is to minimize the cost impacts on the (plant) as we head into the next winter season." Entergy also is still wrangling with a water intrusion issue, as groundwater continues to leach into the plant's turbine building. That water must be trucked off site for out-of-state disposal because it is contaminated with low levels of radioactive tritium.

In August, a plant spokesman said the problem had been curtailed enough that the company was no longer were pursuing a proposal to discharge tainted water into the Connecticut River. McKenney, who serves as technical coordinator for Vermont Yankee decommissioning, said the company now is working to restore an underground barrier between the turbine and reactor buildings.... Leshinskie said he was struck by the similarity between the water control measures that have been implemented at Vermont Yankee and at Fukushima since that disaster. The key difference, he said, is that Entergy has been able to reduce the water incursion rate at Yankee, while Fukushima is still dealing with 5,000 to 10,000 gallons of water incursion daily. In August, a Yankee spokesman said the inflow rate had dropped under 700 gallons a day, from a high of 2,500 to 3,000 gallons daily disclosed in February. "In a few more months, we'll know whether the current efforts (at Vermont Yankee) have been successful," Leshinskie said.

Source: <http://vtdigger.org/>, 25 September 2016.



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