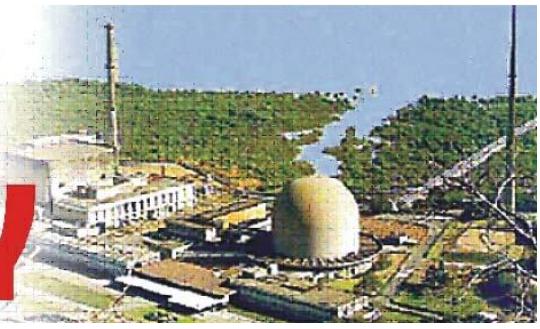
NUCLEAR SECURITY



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

Vol 09, No. 06, 15 Jan. 2015

OPINION – Jamshed Baruah

2015 Crucial for a Nuclear Weapon Free World

2015 marks the 70th anniversary of the atomic bombings of Hiroshima and Nagasaki, and promises to be a crucial year for moving toward a world without nuclear weapons. While indications are that the global movement for banning the bomb is gaining strength, attempts to open a new chapter in nuclear arms race should not be underestimated, a close look at developments in 2014 shows.

A sign of growing awareness of the need to abolish atomic weapons is that 155 governments – more than 80 percent of the members of the United Nations – supported the Joint Statement on the Humanitarian Consequences of Nuclear Weapons tabled at the General Assembly in October 2014.

The view powerfully expressed in the Joint Statement, that it is "in the interest of the very survival of humanity that nuclear weapons are never used again, under any circumstances," expresses the deepening consensus of humankind, noted Daisaku Ikeda, President of Soka Gakkai International (SGI), an indefatigable champion of a world without nuclear weapons.

While indications are that the global movement for banning the bomb is gaining strength, attempts to open a new chapter in nuclear arms race should not be underestimated, a close look at developments in 2014 shows a sign of growing awareness of the need to abolish atomic weapons is that155 governments supported the Joint Statement on the Humanitarian Consequences of Nuclear Weapons tabled at the General Assembly in October 2014.

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Government representatives of 44 out of 158 states, which participated in the December 8-9 Vienna International Conference on the Humanitarian Impact of Nuclear Weapons, said that as long as nuclear weapons exist, the risk of their use by design, miscalculation or madness, technical or human error remains real.

States that expressed support for a ban treaty at the Vienna Conference include: Austria, Bangladesh, Brazil, Burundi, Chad, Colombia, Congo, Costa Rica, Cuba, Ecuador, Egypt, El Salvador, Ghana, Guatemala, Guinea Bissau, Holy See, Indonesia, Jamaica, Jordan,

Kenya, Libya, Malawi, Malaysia, Mali, Mexico, Mongolia, Nicaragua, Philippines, Qatar, Saint Vincent and the Grenadines, Samoa, Senegal, South Africa, Switzerland, Thailand, Timor Leste, Togo, Trinidad and Tobago, Uganda, Uruguay, Venezuela, Yemen, Zambia, and Zimbabwe.

Echoing worldwide sentiments, Pope Francis called in a message to the conference for nuclear weapons to be "banned once and for all". In the message, delivered by Archbishop Silvano Maria Tomasi, Pope Francis told nearly 1,000 participants representing 158 states and over 200 civil society organizations that: "A world without nuclear weapons' is a goal shared by all nations and echoed by world leaders, as well as the aspiration of millions of men and women. The future and the survival of the human family hinges on moving beyond this ideal and ensuring that it becomes a reality."

The Vienna conference was the third after the Oslo gathering in 2013 and Nayarit (Mexico) early 2014. Unlike the previous conferences, the United States and Britain – two of the five members of the nuclear club, along with France, Russia and China – participated. In addition, an unofficial representative from China attended the meeting. Two other nuclear-armed states, India and Pakistan, who took part in the previous two meetings, were also present in Vienna. Responding to the call of 44 states for banning the bomb, Austria delivered the "Austrian pledge" in which it committed to work to "fill the legal gap for the prohibition and elimination of nuclear weapons" and pledged, "to cooperate with all stakeholders to achieve this goal".

Kudos for Austria: As a gesture of praise for the Austrian pledge, the Washington-based Arms Control Association (ACA) designated Austria's Director for Arms Control, Non-proliferation, and Disarmament Ambassador Alexander Kmentt as the 2014 "Arms Control Person of the Year". The ACA announced on January 8 that Kmentt had received the highest number of votes in an online poll. ...

NPT, which entered into force in March 1970, seeks to inhibit the spread of nuclear weapons. Its 190 states-parties are classified in two categories: NWS and NNWS. Under the treaty, the five NWS commit to pursue general and complete disarmament, while the NNWS agree to forgo developing or acquiring nuclear weapons. Article VI commits the NWS to "pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control."

PNND Council Member EU Foreign Minister: Another important development that boosted the movement for a nuclear weapon free world was the nomination of Italian Foreign Minister Federica Mogherini as the High Representative of the European Union for Foreign Affairs and Security Policy, replacing Catherine Ashton.

Mogherini has played an active role in PNND (Parliamentarians for Nuclear Non-proliferation and Disarmament), endorsing a number of PNND member-led initiatives including the Parliamentarians Declaration Supporting a Nuclear Weapons Convention and the Joint Parliamentary Statement for a Middle East Free from Nuclear Weapons and all other Weapons of Mass Destruction.

She has spoken at several PNND events and led initiatives in the Italian parliament including a resolution adopted unanimously in June 2009 supporting the UN Secretary-General's Five Point Proposal for Nuclear Disarmament. Mogherini has been a member of PNND since she first became a member of the Italian parliament in 2008, and has served on the PNND Council since 2010. She has also become a member of the European Leadership Network for Multilateral Nuclear Disarmament and Non-Proliferation, and of the CTBT Group of Eminent Persons. PNND has also worked with her husband Matteo Rebesani in his role as one of the organisers of the Nobel Peace Summits – in particular to build an active nuclear disarmament program for the Summits and for cooperation between Nobel Peace laureates on nuclear disarmament.

'Nuclear Deterrence': While these and similar development give cause for sanguine optimism that 2015 might turn out to be a milestone on the

road to a nuke-free world, tensions in relations between the US and Russia over Ukraine have triggered discussions about the continued relevance of 'nuclear deterrence'. Supporters of this theory hold that nuclear weapons are intended to deter other states from attacking with their nuclear weapons, through the promise of retaliation and possibly MAD.

'Sputnik' reported on 17 December 2014 that the last Soviet leader, Mikhail Gorbachev, still considers nuclear arsenals as a crucial factor of international security. Such destructive weapons must be prevented from falling into the hands of extremists at all costs, he said in an interview with RT TV channel. "I do not agree with those who claim that nuclear threat is not a deterrent anymore. We are now far more aware of what nuclear weapons and nuclear power are [capable of]," Gorbachev reportedly said.

Gorbachev cited Russia's R-36M (SS-18 Satan) intercontinental ballistic missile, which he said has an explosive force "of a hundred Chernobyls," as an example of why nuclear weapons are still a crucial factor of international security. He stressed this kind of destructive weapons must be prevented from falling into the hands of extremists at all costs. Earlier in December 2014, Russian President Vladimir Putin emphasized the importance of maintaining the country's nuclear deterrence capability due to the growing number of security challenges. As one of his final acts of 2014, on December 26, President Putin signed Russia's new military doctrine. In principle, the doctrine, an official statement on national defence, is regularly updated and made public. Its previous iteration had been in place since February 2010.

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Writing in the National Interest on December 31, Dmitri Trenin said: "In the run-up to the publication of the text, there were gloomy predictions. One suggested that the United States and its NATO allies would be formally designated Russia's likely adversaries. Another one, based on the remarks of a senior serving general, expected Russia to adopt the notion of preventive nuclear strike. Neither of these provisions found its way into the published document. The doctrine does, however, faithfully reflect the sea change that occurred in Russia's foreign policy and security and defense postures in 2014."

Trenin argues that essentially, for Russian Commander-in-Chief Putin and for his generals, admirals and security officials, war in 2014 ceased to be a risk and turned into grim reality. Russia has had to use its military forces in Ukraine, arguably the most important neighbor it has in Europe. The conflict over Ukraine, in Moscow's view, reflects the fundamental reality of an "intensification of global competition" and the "rivalry of value orientations and models of development."

"There was a time when nuclear weapons were seen as the best way to prevent world war. Not anymore," says an observer of the Vienna conference." "Supporters of disarmament – including the Red Cross, Pope Francis, and, believe it or not, Henry Kissinger – say that's wrong" and that deterrence does work in a multipolar world. Instead, the presence of nuclear weapons just creates an incentive for more proliferation, as small countries try to one-up their regional adversaries.

Addressing experts in Geneva on December 17, Robert Wood, the US Special Representative to the Conference on Disarmament said: "Looking ahead, it remains the policy of the US to achieve the peace and security of a world without nuclear weapons. And we are facing new challenges as we consider how to responsibly eliminate the last 15% of those weapons. As we move to smaller and smaller numbers, leading to zero globally, we must in turn

become rigorously more and more confident and trusting that all are fulfilling their commitments."

He added: "In considering future reductions, the United States believes that the focus must be on responsible measures that can be trusted and verified. We will learn from our past experience and continue to move ahead with each step building on the last. While there is no pre-determined sequence of steps, and indeed we should pursue progress on multiple paths, there is no way to skip to the end and forgo the hard work of preparing for the technical and political disarmament challenges that lie ahead. Patience and persistence are needed from all NPT parties both among and beyond the P5."

Pakistan has so far shown a reactive nuclear posture towards India. Pakistan did not sign the NPT and CTBT simply because India did not sign them and Pakistan tested its nuclear weapons because India tested its own (second time) in 1998. In this way, Pakistan has selected to hide behind India's nuclear posture instead of erecting its own.

Source: http://www.eurasiareview.com, 10 January 2015.

OPINION – Qaisar Rashid

The Nuclear Future of Pakistan

The faster the world is entering the age of space technology coupled with electronic jamming systems and missile defence systems, the quicker nuclear bombs are losing their importance as annihilating instruments. It is said that the end of the Cold War in 1991 marked the advent of the second nuclear age, the first being the Cold War era itself. The second nuclear age can be divided into two phases. The first phase was from 1991 to 2000 in which Pakistan refused to sign the NPT and CTBT, and tested its nuclear weapons in May 1998. Nevertheless, the era ended with Pakistan (like India) struggling to cope with economic sanctions (under the Glenn Amendment) imposed by the US in reaction to their nuclear tests. The second phase (from 2001 onward) began with the gory incident of 9/11. This phase is marked by Pakistan's entering into the war on terrorism. Consequently, two concessions were given to Pakistan: first, economic sanctions were lifted and, second, the (alleged) activities of the nuclear proliferation network of Dr Khan were condoned (though the stigma of nuclear proliferation is still attached to Pakistan's name). Economic sanctions on India were also lifted in 2001 and it joined the war willingly.

Pakistan is a *de facto* nuclear state but it is still at the level of an unrecognised one (or not a legitimate nuclear power). Pakistan intended to sign both treaties as a legitimate nuclear power and not as a non-nuclear power. Pakistan, like India, had been refused to do so. Nevertheless, there can be identified five main facets that have individual or collective bearing on the nuclear future of Pakistan. First, Pakistan has so far shown a reactive nuclear posture towards India. Pakistan did not sign the NPT and CTBT simply because India did not sign them and Pakistan tested its nuclear weapons because India tested its own (second time) in 1998. In this way, Pakistan has selected to hide behind India's nuclear posture instead of erecting its own.

Second, Pakistan claims that its nuclear capability is for deterrence against any Indian aggression. In relation to the phrase, nuclear deterrence, Pakistan may be thinking in terms of first strike or second strike capability as a nuclear-use doctrine, though it is understandable that first strike (convenient for Pakistan) against India is difficult because of India's huge Muslim population and the second strike (not convenient for Pakistan) against India is itself full of technical complexities in the given (longitudinal) strategic depth of Pakistan.

However, it seems that Pakistan is approaching a time when the relationship between nuclear and deterrence (whether minimum or maximum and whether quantitative or qualitative) may become irrelevant. Similarly, the time is moving beyond strike options, as counter-strike capabilities are the talks of a nuclear warfare that has practically

never taken place except theoretically. The faster the world is entering the age of space technology coupled with electronic jamming systems (electronic warfare) and missile defence systems (missile warfare), the quicker nuclear bombs are losing their importance as annihilating instruments. Pakistan is not ready yet for these types of warfare.

Pakistan still takes refuge in various theories of encirclement such as China encircling India, India encircling Pakistan and the US encircling China. These theories help Pakistan to be fearful of one country and to count on another country to readjust its foreign policy accordingly.

Third, Pakistan still takes refuge in various theories of encirclement such as China encircling India, India encircling Pakistan and the US encircling China. These theories help Pakistan to be fearful of one country and to count on another country to readjust its foreign policy accordingly. However, the post-2001 era has brought to the fore the necessity of economic cooperation. For instance, in 2008, the US signed the 123 Agreement with India to sell it nuclear fuel and reactor components for civilian nuclear consumption to generate energy. The US expected to earn something in return. Similarly, the US-China trade volume (import plus export) was $ 521 billion in 2013 in comparison to two billion dollars in 1979, despite differences between both countries on various disputes over the South China Sea.

Three independent economies (US, China and India) are trying to share something financial amongst them. Pakistan is relying on two of them financially and is hostile towards one of them militarily. Pakistan has not yet realised that encirclement theories are more congruous to the Cold War era than afterwards.

One of the major reasons compelling the US to engage China and India was to make them contribute politically and economically to the war on terror, and they did. In a way, three independent economies (US, China and India) are trying to share something financial amongst them. Pakistan is relying on two of them financially and is hostile towards one of them militarily. Pakistan has not yet realised that encirclement theories are more congruous to the Cold War era than afterwards.

Fourth, Pakistan relies overly on China to gain strength of its (nuclear and physical) survival regionally. However, the post-2001 era is witnessing a gradual shift in China's position both regionally and internationally and with that the comfort zone (where Pakistan used to bask) is also shrinking. China and India are both trying to foster trade relations with each other (despite their differences on Tibet) and seek benefits from each other's growing economies. For example, there are earnest efforts from both sides to develop a land trade route such as the Bangladesh, China, India and Myanmar (BCIM) economic corridor and sea route such as the Maritime Silk Road (MSR).

Both countries also intend to deal with each other politically and economically at the platform of the SCO where Russia is their third main partner. Both countries are willing to invest in each other and enhance people-to-people contact. Similarly, both are willing to settle for border peace through mutual settlement or through the status quo. Pakistan has not learnt yet how to survive both regionally and internationally without China's help. ...

Source: http://www.dailytimes.com.pk, 07 January 2015.

OPINION – Rizwan Asghar

Our Nuclear Nightmare

If you ever ask nuclear advocates in our strategic community why Pakistan is going down the dangerous road leading towards the development of TNWs, the most logical explanation could be a description of the threats emanating from India's Cold Start Doctrine (CSD). The CSD is basically a

strategy to execute a 'limited war under a nuclear overhang'; the Indian army has been working on it since 2004. Although the Indians deny the existence of the CSD, the Indian army has repeatedly conducted military exercises to operationalise it. In order to counter this provocative doctrine, the Pakistani military has developed a short-range nuclear system to dissuade India from contemplating any 'limited' strike against our country. However, according to many experts, India's CSD and the Pakistani move towards TNWs have significantly raised the dangers of nuclear escalation between the two countries.

TNWs, as opposed to strategic nuclear weapons, are aimed at 'counter force targets' and their deployment is much more convenient than that of strategic nuclear weapons. Pakistan'snuclear establishment is of the view that the development of TNWs is designed to ensure 'full-spectrum deterrence' when the strategic environment in South Asia is rapidly shifting.

TNWs, as opposed to strategic nuclear weapons, are aimed at 'counter force targets' and their deployment is much more convenient than that of strategic nuclear weapons. Pakistan'snuclear establishment is of the view that the development of TNWs is designed to ensure 'full-spectrum deterrence' when the strategic environment in South Asia is rapidly shifting. It is further hoped that TNWs will substantially strengthen Pakistan's deterrence abilities. However, there is no strong evidence to suggest that these tactical weapons are really necessary for minimal, credible deterrence. The small size of TNWs add little to deterrence and only the threat of 'massive nuclear retaliation' can stop India from launching limited conventional strikes. If India is not deterred from nuclear attack by 100-plus warheads, it is difficult to understand how a few tactical weapons will make any difference.

The truth is that Pakistani nuclear experts have rarely, if ever, tried to examine the utility of developing battlefield nuclear weapons. In actuality, the deployment of TNWs will be detrimental to deterrence stability in the region, making the unauthorised use of nuclear weapons more probable.

The Indian armed forces have also repeatedly warned that the Indian nuclear doctrine makes no distinction between tactical and strategic weapons. Even a limited Pakistani nuclear attack would be met with massive nuclear retaliation. The truth is that Pakistani nuclear experts have rarely, if ever, tried to examine the utility of developing battlefield nuclear weapons. In actuality, the deployment of TNWs will be detrimental to deterrence stability in the region, making the unauthorised use of nuclear weapons more probable. ...The CSD is a non-starter as it assumes a capability for high-tech combined-arms warfare that India cannot acquire in the near future.

Many western analysts are afraid that the continuing expansion of India's and Pakistan's nuclear capabilities increases the chance of any small conflict escalating into a full-blown nuclear war in South Asia. Because some non-strategic nuclear weapons are deployed against the conventional forces in the battlefield, they enhance the risk of such escalation. For almost a decade after the 1998 nuclear tests, Pakistan's nuclear establishment aimed to have only enough weapons for maintaining a 'credible minimum deterrent' because we could not waste massive resources to engage in a nuclear arms race with India. However, during the past five years, the nuclear security managers have forgotten the aim of maintaining a 'modest' nuclear arsenal.

Some nuclear advocates in Pakistan make out a case that the policy of developing TNWs is similar to NATO's nuclear posture towards the Soviet Union during the first two decades of the cold war. However, these nuclear advocates not only ignore the many problems of escalation control faced by

NATO at that time but also use an analogy that is highly misleading and mistaken in many key aspects. By the 1960s, it was acknowledged by NATO officials that the use of TNWs could not avert defeat and even their limited use would completely devastate their own territories....

This shows that if the US military failed to develop a workable force structure to employ TNWs, Pakistan's nuclear establishment could not be expected to have any genius to perform this miracle. It is so far unclear if Pakistan will use short-range nuclear weapons to annihilate advancing Indian troops near our big cities. Such an attack would turn Pakistan's densely populated agricultural heartland into a nuclear wasteland and also cause serious radiation damage to other parts of the country. This was a major reason the idea of employing these weapons against any Soviet advance was eventually abandoned by NATO countries. The fact is that the atomic bomb, in fact, cannot be effectively used as a tactical weapon. The current approach of our nuclear establishment foolishly assumes that if thousands of Indian troops move into Pakistani territory, we can use these weapons against them without killing our own citizens.

Both countries can afford neither Cold Start-type doctrines nor battlefield nuclear weapons. Pakistan should take immediate steps to eliminate tactical weapons and instead focus on its 'internal' security challenges. Today, our economy is only one-seventh of India's and our financial position is rapidly in decline. The government should spend more money on uplifting the economic situation of the people than on misconceived strategies. Finally, our civilian government also needs to play a role in determining the overall military strategy....

Source: http://www.thenews.com.pk, 07 January 2015.

OPINION – Ian Klinke

NATO's Nuclear Relapse

Moscow's latest tests of intercontinental missiles and its parading of nuclear capable strategic bombers have rightly prompted international concern. In December 2014, Russian Foreign Minister Lavrov implied that Russia might be moving nuclear weapons to Crimea. From violations of airspace to near mid-air collisions, the number of incidents between Russia and NATO has soared dramatically, increasing the danger of an unintended escalation. Yet, it is rarely mentioned that NATO, too, is back in the game of nuclear deterrence. Washington has recently sent its nuclear capable B-2 and B-52 to Europe for training missions with its NATO partners. It also continues to test IBMs. Most problematically, the western military alliance is currently modernising the air-launched nuclear gravity bombs that fall under NATO's nuclear sharing initiative.

Brave Old World: ...We can only speculate, for the exact location of these approximately 180 air-launched B61 weapons is of course secret. ...Designed in the 1960s for use by high-speed aircraft, the thermonuclear B61 is a versatile weapon that comes both as an intermediate range strategic and a short-range tactical weapon with a wide variety of yields. A relic of the early Cold War, it is not just a US but a "NATO weapon" in that its stationing and delivery also involves non-nuclear member states, such as Belgium, Germany, Italy, the Netherlands and Turkey. Tactical nukes are particularly problematic because their short range provides the missing link between a localised conventional war and a highly improbable global exchange of strategic nuclear missiles between Moscow and Washington.

Tactical nuclear weapons are no status quo weapons. Their battlefield purpose increases the chance of a nuclear escalation, which is why the superpowers removed most of them from Central Europe in the late 1980s and early 1990s. If everything goes to plan, the controversial B61 weapons will be modernised by around 2020. This "life extension programme" is not simply an initiative to replace rusty old nukes with shiny new ones, but an attempt to increase their accuracy, to replace free fall with precision guided bombs.

Ultimately, this will transform the B61 into a new kind of weapon and undermine any pretence that the West is still in the game of denuclearisation. Interestingly, plans to modernise the B61 were initiated in April 2010, only shortly after NATO decided to scrap its nuclear missile shield in Eastern Europe and in the same month that the two largest nuclear powers signed a new Strategic Arms Reductions Treaty. How does NATO explain this nuclear relapse precisely at a time when the alliance had just "reset" its relations with Russia? And what role does the B61 play in the Ukrainian proxy war?

The first part of the answer lies in NATO's recent failures. Clearly, the standoff with Russia is a welcome distraction from its fiasco in Afghanistan and the alliance's lack of a purpose in the absence of Milosevic or Gaddafi. Yet, there is more to this than just an identity crisis.

...Why this relapse to what Shea calls "the nuclear game"? The first part of the answer lies in NATO's recent failures. Clearly, the standoff with Russia is a welcome distraction from its fiasco in Afghanistan and the alliance's lack of a purpose in the absence of Milosevic or Gaddafi. Yet, there is more to this than just an identity crisis. NATO, as Trine Flockhardt so aptly puts it, is something of a "nuclear addict" - it hangs on to its nuclear weapons despite frequently declaring its desire to abandon them. Both US President Obama and NATO's new General Secretary Stoltenberg are known advocates of nuclear disarmament - but in 2014 their alliance is stepping up its nuclear deterrence and the US administration is pouring $1trn into the future of its nuclear weapons systems.

The West is currently too preoccupied with Russia's new nuclear militarism to notice the way that its own military alliance functions as an agent of regional insecurity. Lest we forget, NATO never abandoned its "first use" doctrine. It does not rule out the possibility of being first to go nuclear in an armed conflict with another nuclear power.

There are obvious pressures behind this nuclear habit, from the nuclear arms industry via hawkish politicians and generals to certain Eastern European NATO members - but the real issue is a lack of public scrutiny. In the UK, the debate about nuclear weapons tends to concentrate on Britain's nuclear submarines and what would happen to them if Scotland declared independence. The US is currently preoccupied with the safety of its nuclear silos. These issues are of course important, but they should not cause us to overlook NATO's nuclear relapse. ...Indeed, governments remember all too well their predecessors' struggles with the peace and anti-nuclear movement of the 1980s....

The Dog That Didn't Bark: In 2014, the spotlight briefly returned to that one-time symbol of division in Europe, the Berlin wall. Even Gorbachev attended the festivities on November 9, a spectacle of lights, balloons and emotions. Twenty-five years after its fall, the Berlin wall is one of the world's most heavily memorialised sites, a tourist attraction like few other 20th century structures. But while the wall remains the symbol of the Cold War in schoolbooks, op-eds and emotive speeches, it is also a highly problematic one. Rather than representing the threat of mutual nuclear annihilation, it always stood for a much simpler lesson – that of the West's moral victory over the "prison" of real existing socialism. If we want to understand the Cold War in all its self-destructiveness, we need to look elsewhere.

A visitor to villages that lie near nuclear weapons storage sites in Europe might be surprised to be greeted by American flags in shop windows and front gardens. This form of identification with US nuclear weapons is puzzling given that these sites would be primary targets in the event of a nuclear war with Moscow. The West is currently too preoccupied with Russia's new nuclear militarism to notice the way that its own military alliance functions as an agent of regional insecurity. Lest

we forget, NATO never abandoned its "first use" doctrine. It does not rule out the possibility of being first to go nuclear in an armed conflict with another nuclear power.

Some will argue that "now is not the time" to start a public debate on NATO's tactical nukes, but even these critics would have to concede that the modernisation of the B61 further compromises the West's position in the 2015 revision of the NPT. If a new arms race is to be prevented in its infancy, the sleeping dog might have to learn to bark and bite again.

Source: http://www.aljazeera.com: 31 December 2014.

OPINION – Milan Rai

Abolishing Nuclear Weapons – Useful and Not-So-Useful First Steps

The most urgently-required negative security assurance (NSA) is a promise by all the declared nuclear weapon states never to use or threaten to use nuclear weapons against a non-nuclear weapon state.

Last month saw a cascade of news on the nuclear weapons front. The Vienna Conference on the Humanitarian Impact of Nuclear Weapons was attended by 157 countries including the US and UK. After the conference, the third in a series, host nation Austria issued a historic pledge to work 'to identify and pursue effective measures to fill the legal gap for the prohibition and elimination of nuclear weapons'," and to cooperate with all relevant parties 'to stigmatise, prohibit and eliminate nuclear weapons in light of their unacceptable humanitarian consequences and associated risks'. At least 42 countries will now begin the political process of drawing up a treaty to ban nuclear weapons (joining the Biological Weapons Convention of 1972 and the Chemical Weapons Convention of 1993).

In December [2014], India marked two major developments in its ground-based nuclear weapons capability, with the first successful test of the 2,500-mile-range Agni-IV, the first Indian ballistic missile able to deliver nuclear warheads deep inside China; and testing of the delivery platform for the Agni-V, with its range of up to 3,400 miles, bringing the whole of China within range.

Also in December, the Marshall Islands, subjected to 67 nuclear tests by the United States in the 1940s and 1950s, put forward written arguments in the World Court, taking the eight declared nuclear weapon states – and Israel – to task. The Pacific state (with a population of less than 70,000) wants the World Court to order the nuclear weapon state signatories to the 1968 NPT to live up to their promise in the NPT to end the arms race 'at an early date' and to negotiate a treaty on 'complete disarmament'.

In December [2014], India marked two major developments in its ground-based nuclear weapons capability, with the first successful test of the 2,500-mile-range Agni-IV, the first Indian ballistic missile able to deliver nuclear warheads deep inside China; and testing of the delivery platform for the Agni-V, with its range of up to 3,400 miles, bringing the whole of China within range. (In 2016, as well as deploying the Agni-V, India plans to bring its first nuclear missile-carrying submarines into service, completing its nuclear air-land-sea 'triad'.) As is well-known, India has fought several wars with its neighbours (Pakistan and China) since its birth as an independent nation in 1947, and war with Pakistan remains an ever-present threat.

Less well-known is the fact that a 'limited' nuclear war between Pakistan and India would create a massive injection of 'black carbon aerosol particles' (soot) into the atmosphere that would reduce rainfall and temperatures across the world – for a decade – with a devastating impact on global agriculture. Studies assembled by International Physicians for the Prevention of Nuclear War and Physicians for Social Responsibility in 2013 indicate that: 'In addition to the one billion people in the developing world who would face possible starvation, 1.3 billion people in China would confront severe food insecurity.'

Other nuclear weapons news in December [2014] included the threat by Russia to place nuclear weapons in Crimea, the province of Ukraine that it illegally annexed in March 2014; a UN General Assembly vote calling on Israel to renounce its nuclear weapons, sign the NPT, and place its nuclear facilities under an international inspection regime; and reports of China's deployment of long-range ballistic missiles on its Jin-class submarines.

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Each situation is different, and each nuclear weapon state faces different forces driving it to take part in the nuclear arms race. Thus, while several Western media outlets tried to whip up fears of Chinese submarine-launched nuclear strikes on the USA, it was pointed out several years ago that the Jin-class submarine is noisier than Russian submarines built in the 1970s, making them highly vulnerable to US anti-submarine warfare if they ventured past Hawaii to bring the continental USA into range. Hans M Kristensen of the Federation of American Scientists observed in 2009 that this vulnerability probably meant that the Jin ballistic missile capability was being developed because of regional 'scenarios involving India or Russia that have less capable anti-submarine forces'.

By the logic of the arms race, the development of the Jin submarine-launched ballistic missile capability is one factor driving India's push for its own submarine-launched ballistic missile force. Given these many complex dynamics, it is impossible to find a single measure that would reduce the threat of nuclear war across the world.

By the logic of the arms race, the development of the Jin submarine-launched ballistic missile capability is one factor driving India's push for its own submarine-launched ballistic missile force. Given these many complex dynamics, it is impossible to find a single measure that would reduce the threat of nuclear war across the world. However, there is one measure that would make a significant difference, which ought perhaps to be the immediate focus of disarmament efforts.

There have been many suggestions for short-term priorities. In the run-up to the Vienna Conference on the Humanitarian Impact of Nuclear Weapons, some thoughts were offered on this score from an establishment perspective by £ukasz Kulesa, Research Director of the European Leadership Network, a London-based foreign policy think tank. Kulesa scorned the idea that 'total elimination of nuclear weapons can be achieved by adopting treaties without the presence of the main nuclear protagonists', describing such a treaty text as a 'sand castle'. ...Kulesa put forward three priorities. Firstly, he noted that 'the attractiveness of nuclear weapons seems to be on the rise, and it can be significantly decreased only if the stability of the international system as such is re-established'.

Secondly, he observed: 'Equally worrisome, some states have been developing both the nuclear weaponry and the doctrine for nuclear weapon use on the battlefield, to strike particularly valuable targets or to stop a conventional attack by an opponent.... Exposing the dangerous delusion of "battlefield-only" nuclear weapons should be a priority, especially since even a single low-yield detonation would have disastrous political, humanitarian and environmental consequences.' Finally, Kulesa pointed to the

danger that the NPT Review Conference meeting in April 2015 could lead to some members being tempted to withdraw from the Treaty as a way to demonstrate their frustration with the glacial pace of fulfilling nuclear disarmament obligations'.

There is one measure that would help to address all three of Kulesa's concerns, which would be for all declared nuclear weapon states to sign up to a legally-binding and comprehensive nuclear 'negative security assurance'. A positive security assurance is a promise to take action to support another state's security if it is endangered. A negative security assurance is a commitment not to engage in (specified) actions that could endanger the security of another state. In relation to nuclear weapons, the most urgently-required negative security assurance (NSA) is a promise by all the declared nuclear weapon states never to use or threaten to use nuclear weapons against a non-nuclear weapon state.

The US takes it upon itself to decide whether a non-nuclear weapon state is in compliance with its NPT obligations. It also explicitly gave itself the option of using nuclear weapons to deter 'a conventional or CBW attack against the US or its allies and partners' by a nuclear weapon state, or a non-nuclear weapon state not in compliance with its NPT obligations.

This simple measure has been impossible to obtain. The US has gradually been forced to remove loopholes from its NSA, with the result that in the 2010 Nuclear Posture Review the text had been simplified to this point: 'the US will not use or threaten to use nuclear weapons against non-nuclear weapons states that are party to the NPT and in compliance with their nuclear non-proliferation obligations'. The US takes it upon itself to decide whether a non-nuclear weapon state is in compliance with its NPT obligations. It also explicitly gave itself the option of using nuclear weapons to deter 'a conventional or CBW attack against the US or its allies and partners' by a nuclear weapon state, or a non-nuclear weapon state not in compliance with its NPT obligations (in the view of the US).

The British 2010 Strategic Defence and Security Review also removed some loopholes in its previous NSAs: 'the UK will not use or threaten to use nuclear weapons against non-nuclear weapon states parties to the NPT.... This assurance would not apply to any state in material breach of those non-proliferation obligations'. The UK then made a wider reservation than the US in relation to other WMD: 'We also note that while there is currently no direct threat to the UK or its vital interests from states developing capabilities in other weapons of mass destruction, for example chemical and biological, we reserve the right to review this assurance if the future threat, development and proliferation of these weapons make it necessary.'

So the UK included chemical weapons as well as biological weapons in this exception; appeared to threaten non-nuclear weapon states in compliance with their NPT obligations who developed CBW; and explicitly mentioned CBW threats against Britain's 'vital interests' (not just British territory) as a justification for the use or threatened use of nuclear weapons. In contrast, China has from the outset offered an unconditional NSA to all non-nuclear weapon states, whether party to the NPT or not (as well as a no-first-use pledge towards nuclear weapon states), and has expressed willingness to sign a legally-binding NSA treaty. The importance of a legally-binding no-loophole NSA treaty is that it restricts the ability of nuclear weapon states to engage in nuclear coercion or intimidation – what I called in an earlier essay nuclear terrorism.

China has from the outset offered an unconditional NSA to all non-nuclear weapon states, whether party to the NPT or not (as well as a no-first-use pledge towards nuclear weapon states), and has expressed willingness to sign a legally-binding NSA treaty.

...If the no-loophole NSA treaty were signed, it would reduce the attractiveness of nuclear weapons and contribute to the stabilisation of the international system; it would remove an important justification for the US development of low-yield nuclear warheads; and it would give new strength to the NPT (especially if the NSA were restricted to non-nuclear weapon state members of the NPT – though in that case it should be made clear that it would be the IAEA that would decide who was in compliance with their nuclear obligations, not the US or UK unilaterally).

If the no-loophole NSA treaty were signed, it would reduce the attractiveness of nuclear weapons and contribute to the stabilisation of the international system; it would remove an important justification for the US development of low-yield nuclear warheads; and it would give new strength to the NPT.

It is possible that the NSA treaty could become part of what Austria calls 'fill[ing] the legal gap for the prohibition and elimination of nuclear weapons'. It's also possible that a no-loophole, legally-binding NSA treaty could be the most useful short-term outcome of the pressure exerted by the countries pursuing a nuclear abolition treaty. What is certain is that if the world community cannot force the declared nuclear weapon states to sign a legally-binding no-loophole NSA treaty, it will never be able to force them to disarm. That is nuclear realism.

Some Congressional critics, pointing to technological flaws in current defense systems, advocate suspending building national missile defense systems further until the underlying technology improves.

Source: http://www.telesurtv.net/, 05 January 2014.

OPINION – Richard Weitz

Congress' Missile Defense Opportunity

One of the first tasks the new Congress will need to consider is how to strengthen the US National Missile Defense program. No congressional responsibility is more important than protecting the American people against nuclear threats from North Korea and other US adversaries. Congress can have an early impact by highlighting the issue during the Senate confirmation hearings for Former Deputy Secretary Ashton Carter.... Some Congressional critics, pointing to technological flaws in current defense systems, advocate suspending building national missile defense systems further until the underlying technology improves. In particular, they propose waiting for what could take more than five years to design, develop, and deploy a next-generation exo-atmospheric kill vehicle — the critical part of the missile interceptor that destroys enemy missiles in space — to protect the US homeland.

However, suspending construction of any of our missile defense systems is a risky venture; an unexpected North Korean or Iranian missile threat to the US homeland could emerge before the new technology is ready. And there is no guarantee that future systems will be more effective than currently available versions. Therefore, the most prudent budget and security strategy for the Pentagon and Congress is to work on improving the existing interceptors while developing and testing new ballistic missile technologies. Missile defense relies on a variety of platforms, providing multiple opportunities to defeat limited missile attacks. This mixture of sensors and interceptors is an underappreciated strength of our national missile defense shield, as no single system is capable of engaging ballistic missiles of all ranges and through all phases of their flight. Moreover, if one part of the system fails to work properly, an incoming missile may still be destroyed by other components.

In particular, the Ground-Based Midcourse Defense is a critical component of the architecture, as it targets a long-range ballistic

missile when it is flying outside the atmosphere. This midcourse phase lasts much longer than the short time the missile needs to ascend into space or to later release its warheads into the atmosphere during their terminal phase. A crucial feature of midcourse missile defense is that the defender, if supported by adequate sensors and shooters, has time to concentrate on destroying the incoming missile and to exploit multiple shooting opportunities against its warheads, helping compensate with the inescapable complexities of target identification and inevitable intercept failures.

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Currently, the US has 26 Ground-Based Interceptors at Fort Greely in Alaska and four at Vandenberg Air Force Base in California. This GMD system is designed to shoot down incoming long-range ballistic missiles, such as those from North Korea or Iran, which lack the sophisticated countermeasures available to Russia, China, or the United States. At Congressional urging, the Pentagon is adding 14 more interceptors by the end of 2017. Engineers have identified hardware and software fixes for the flaws exposed by recent tests, shortcomings the system has had to overcome because it was fielded so quickly. Having more interceptors would further improve the system's overall reliability.

Source: http://www.rollcall.com, 06 January 2015.

OPINION – James Carroll

Tiny Pacific Nation Aims to Stop New Nuclear Arms Race

Only a different future can redeem a terrible past. That's the lesson of what a tiny atoll nation did in December [2014]. The Republic of the Marshall Islands, in the far Pacific, took the nine nuclear weapons states to court - the International Court of Justice in Hague - demanding that they be prevented from initiating a new nuclear arms race. That, in fact, is what's happening, as the US and others set about the reinvention of their nuclear arsenals. The Marshall Islands are desperately trying to rescue the 1968 NPT, which made authentic steps toward disarmament a matter of international law. Nuclear modernization of the kind being ordered in Washington and elsewhere assumes the weapon's permanence, and is therefore illegal. It will push the world across yet another, ever more dangerous, threshold. That is the argument the wee nation is making before the court.

Even if the court found against the nuclear nations, they would not heed the ruling. The high-tech reinvention of nuclear weaponry is assumed to be inevitable, and so is the flood of proliferation that will follow from it. Let's call the dream of disarmament what it always was: an impossible mirage.

Talk about a mouse that wants to roar. Even if the court found against the nuclear nations, they would not heed the ruling. The high-tech reinvention of nuclear weaponry is assumed to be inevitable, and so is the flood of proliferation that will follow from it. Let's call the dream of disarmament what it always was: an impossible mirage. But one decisive piece of the history of the court plaintiff suggests otherwise: Not every nuclear threshold must be crossed. When it was a territory of the US in the 1950s, the Marshall Islands were the testing range for America's bomb, an ultimate ground zero where more than 60 nuclear explosions took place. With one of them, on 31 October, 1952, the US led the way into the era of thermonuclear weapons by setting off the world's first hydrogen bomb. All but forgotten now, that event marked a vast escalation of destructive power, 500 times greater than the bomb that destroyed Hiroshima. And it need not have happened.

Scientists who had led the Manhattan Project opposed the move from the atomic bomb to what they called the "super" because the power unleashed by fusion, as opposed to fission, had infinitely more potential for ruination. The "genocidal weapon" was inherently evil. Instead of assuming that the development of the H-bomb was inevitable, the scientists proposed that the US and the SU, which was preparing its own test, jointly agree to regard the "super" as a threshold not to be crossed.

Physicians, academics, economists, churches, and professional groups of all kinds began passing freeze resolutions whenever they met, and soon a global grassroots movement changed the political equation on both sides of the Iron Curtain, preparing the way for history's first turn away from nuclear escalation.

In hindsight, the idea is not as naive as it might have seemed, since Stalin's death was soon to soften attitudes in the Kremlin, and the head of the Soviet H-bomb project was Andrei Sakharov, who would become Moscow's leading antiwar dissident. As it happened, President Truman, in his last major decision, overruled the scientists who opposed the hydrogen bomb and ordered the October test. Under the mushroom cloud, the entire island on which the target structure sat simply disappeared. The Marshall Islands carry the wound of this history in its blood - literally, as radiation sickness. The rest of the world can blithely ignore what is happening even now behind the walls of the nuclear arsenals, including America's, but not this small country, which refuses to accept the final defeat of humanity's greatest hope.

Recent times have seen a steady shift in the usage of nuclear technology from predominantly defence purposes to increasingly civilian applications, such as the generation of electricity. Though the global threat of nuclear weapons continues to overshadow the benefits of peaceful nuclear technology, the tide surely seems to be turning, with the international outlook favouring the civilian use of nuclear technology.

...Dozens of international peace groups and NGOs are supporting the Marshall Islands case, ...Physicians, academics, economists, churches, and professional groups of all kinds began passing freeze resolutions whenever they met, and soon a global grassroots movement changed the political equation on both sides of the Iron Curtain, preparing the way for history's first turn away from nuclear escalation. The time has come for a second such turn. One of the smallest nations on the planet, yet speaking with the unrivaled moral authority that comes of having been blasted and contaminated, is demanding that the new nuclear threshold not be crossed....

Source:http://www.bostonglobe.com, 05 January 2015.

OPINION – Kota Sriraj

'Nuclear' is Not a Dirty Word

The vilification of nuclear energy goes back to a time when such energy could only be used as a weapon of mass destruction. It must stop. This is a clean and efficient power, and it must be included in the global energy mix. Recent times have seen a steady shift in the usage of nuclear technology from predominantly defence purposes to increasingly civilian applications, such as the generation of electricity. Though the global threat of nuclear weapons continues to overshadow the benefits of peaceful nuclear technology, the tide surely seems to be turning, with the international outlook favouring the civilian use of nuclear technology.

As the global energy demand soars, the quest for sustainable sources of energy continues. Globally, 68 per cent of energy generation comes from fossil fuels (41 per cent from coal, 21 per cent from gas, and 5.5 per cent from oil), 13.4 per cent from

nuclear fission and 19 per cent from renewable sources of energy. Given this scenario, harnessing the potential of renewable energy, such as wind and solar, comes across as an appropriate first consideration for sustainable development because, apart from constructing the plant, there is no depletion of mineral resources or pollution of water and air. But, merely harnessing these natural sources is not enough. Other than hydro energy, most of the other renewable sources - notably wind and solar - are diffuse, intermittent and unreliable, by nature of their occurrence.

These aspects offer a technological challenge of some magnitude, given that electricity cannot be stored on a large scale.... Wind is the fastest growing source of electricity in many countries, and there is a lot of scope for further expansion. While the rapid expansion of wind turbines in many countries has been welcomed, the capacity is seldom more than 30 per cent utilised over the course of a week or year, which testifies to the unreliability of the source and the fact that it does not and cannot match the pattern of demand.

While the rapid expansion of wind turbines in many countries has been welcomed, the capacity is seldom more than 30 per cent utilised over the course of a week or year, which testifies to the unreliability of the source and the fact that it does not and cannot match the pattern of demand.

...Also, there is strong opposition on aesthetic grounds from the countryside where wind turbines are located. Therefore, renewable sources, such as wind and solar, are intrinsically unsuited to meet the demand for continuous and reliable supply of energy on a large scale. The criteria for any acceptable energy supply will continue to be cost, safety, and security of supply, besides environmental considerations. Rising demand for energy will place ever greater burden on the natural world, threatening its bio-diversity, unless societies accept nuclear power as a key element of the energy mix.

The full gamut of electricity generation sources, including nuclear power, should be used to replace the burning of fossil fuels such as oil, coal and gas, if the world is to have any chance of fighting severe climate change. Nuclear energy may not strictly qualify as renewable energy but it will eventually emerge as a dependable and sustainable source of energy that has minimal adverse impact on the environment. Lower greenhouse gas emissions and the absence of carbon dioxide and methane, during the generation of nuclear power makes the latter one of the least damaging sources of energy for the environment. Given these green credentials, environmentalists across the world are beginning to accept the practicality of this source of sustainable energy.

Efficiency is the hallmark of nuclear power. For example, a golf ball-sized lump of uranium can supply a lifetime's worth of energy needs of a typical person. ...Cutting-edge and sophisticated technology generation is crucial to bring this environmentally-friendly energy source to our daily lives. Also, in a diverse country such as India, awareness generation is critical to ensure the success of an initiative. The Kudankulam nuclear power plant and the protests pertaining to the operation of the plant are an apt example of the consequences when all stakeholders are not fully convinced of the initiative. Nuclear power has the potential to revolutionise our lives by providing energy security and ensuring a greener future, provided we are able to recognise its capability and harness it.

Nuclear energy may not strictly qualify as renewable energy but it will eventually emerge as a dependable and sustainable source of energy that has minimal adverse impact on the environment. Lower greenhouse gas emissions and the absence of carbon dioxide and methane, during the generation of nuclear power makes the latter one of the least damaging sources of energy for the environment.

Source: http://www.dailypioneer.com, 08 January 2014.

NUCLEAR STRATEGY

USA

Data Shows Drop in US Nuclear Arsenal, Growth in Russia's

The numbers of US nuclear missiles, and deployed bombers, have continued to drop while Russia's have climbed, according to a new US State Department report on strategic weapons. The State Department every year releases a breakdown of the US military's nuclear arsenal to comply with the New START treaty with Russia. Under the treaty, which was signed in 2010, the US and Russia by 2018 must meet a limit of 700 deployed ballistic missiles and deployed heavy bombers; a limit of 1,550 nuclear warheads on deployed missiles and bombers; and a limit of and 800 launchers.

The US military showed declines from the previous year in all three categories, while Russia showed increases: The US has 794 deployed Intercontinental Ballistic Missiles, submarine-launched ICBMs and deployed heavy bombers, down from 809 the year before. Russia's inventory climbed to 528, up from 473. The US has 1,642 warheads on deployed ICBMs, SLBMs and nuclear warheads for deployed bombers, down from 1,688. Russia also has 1,642, but that is up from 1,400.

As of Sept. 1, 2014 according to the report released in January, the US military showed declines from the previous year in all three categories, while Russia showed increases: The US has 794 deployed Intercontinental Ballistic Missiles, submarine-launched ICBMs and deployed heavy bombers, down from 809 the year before. Russia's inventory climbed to 528, up from 473. The US has 1,642 warheads on deployed ICBMs, SLBMs and nuclear warheads for deployed bombers, down from 1,688. Russia also has 1,642, but that is up from 1,400.

The US has 912 deployed and non-deployed missile launchers, down from 1,015. Russia, meanwhile, has 911, up from 894. The majority of the US nuclear arsenal is assigned to the Air Force. Throughout 2014, the service has been demolishing deactivated launch facilities to comply with the treaty. In August, crews with the 341st Missile Wing at Malmstrom Air Force Base, Montana, completed the demolition of 50 Minuteman III launch facilities. Russian inspectors verified that the launchers were demolished.

"At this milestone we remove 50 launchers, bringing us closer to our maximum treaty authorization," said Lt. Col. Tom Wilcox, commander of the 341st Missile Wing, in a release. "Both of these missions [reconfiguring warheads and launcher removal] were long-term operations conducted by the ICBM force in a safe, secure and effective manner and required precision through all facets of execution."

The Air Force inventory in September, compared with 12 months earlier:

* 447 deployed ICBMs, down from 448.
* 307 non-deployed ICBMs, down from 313. That includes 56 of older, nonoperational Peacekeeper missiles, down from 57.
* 467 deployed and non-deployed ICBM launchers, down from 557.
* Seven tests launchers, the same as the year before.
* 87 deployed B-2A Spirits and B-52H Stratofortresses, down from 101. In late 2013, the Air Force eliminated the last 12 of its 39 B-52Gs, a reduction that was required under the treaty.
* 22 non-deployed bombers, up from 21.
* Three test bombers, the same as the year before.

The Navy's nuclear arsenal is mostly unchanged: 260 deployed Trident II submarine-launched missiles in both 2014 and 2013; 151 non-deployed Trident IIs in 2014, up from 147; and 336 deployed and non-deployed missile launchers in both years.

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Source: Brian Everstine, Military Times, 09 January 2015.

NUCLEAR ENERGY

GENERAL

Asia to Lead Nuclear Investment to 2030, Says WNA

Investments totalling some $1.2 trillion could be made in new nuclear power projects around the world, according to the latest forecast by the World Nuclear Association (WNA). More than half of this total will be made in Asia. The WNA's latest survey – entitled *The World Nuclear Supply Chain: Outlook 2030* - examines the opportunities and challenges over the next 15 years. The report's reference scenario envisages the start-up of 266 new reactors by 2030, with an investment of some $1.2 trillion. Taking into account nuclear power plant construction and refurbishment projects for long-term operation the international market for suppliers could be worth $30 billion per year.

The largest region of growth will be Asia - primarily China - where 47 reactors are currently under construction and a further 142 are forecast by 2030. Investment in nuclear projects in Asia could reach $781 billion over the period. Europe and the CIS are also seen as regions for growth, with potential investments of $179 billion and $163 billion, respectively. In North America, where five units are under construction and seven more predicted, investment could total $90 billion by 2030. Africa and Latin America could see investments of $20 billion and $14 billion, respectively.

The report will be launched on 15 January at the *World Nuclear Spotlight* event to be held in Beijing. The largest region of growth will be Asia - primarily China - where 47 reactors are currently under construction and a further 142 are forecast by 2030. Investment in nuclear projects in Asia could reach $781 billion over the period. Kaser, staff director for the WNA's Supply Chain Working Group which produced the report, noted: "With China's nuclear expansion program now well underway, new Chinese suppliers are starting to enter the world market.... Europe and the CIS are also seen as regions for growth, with potential investments of $179 billion and $163 billion, respectively. In North America, where five units are under construction and seven more predicted, investment could total $90 billion by 2030. Africa and Latin America could see investments of $20 billion and $14 billion, respectively.

The industrial opportunities for nuclear power plant decommissioning are also expanding and the reference scenario envisages the closure of 118 reactors, mostly in Europe and Japan. The market for decommissioning could total $95 billion over the period. Of this, $12.4 billion is the estimated cost for cleaning up Japan's Fukushima Daiichi site and at least $24.2 billion has to be spent in Germany, which is phasing out its reliance on atomic energy. Managing the quality and capability challenges along the supply chain will be crucial to securing a reliable and efficient international supplier base. In Europe and North America, capability to manufacture safety-related components and systems has been eroded with a scarcity of new nuclear projects, while in emerging industrial countries, vendors must upgrade to meet the more stringent requirements expected in the nuclear industry.

Unlike some other industries, the nuclear sector has tended to be domestically oriented and vendors operate in a less harmonized regulatory environment. WNA's report looks at the scope for improving coordination between national authorities responsible for licensing nuclear facilities and technology exports, as well as the opportunity for the industry to establish jointly managed programs to encourage high-quality production and a strong culture of safety. Past concerns that 'choke points' existed along the supply chain, for example, in heavy forging capacity and among specialist tube-makers, are unlikely to arise under currently known plans for new nuclear construction. However, if the investment climate for nuclear energy in particular improved significantly and for infrastructure

projects more generally, as the world economy returns to trend growth rates, then the supply industry will need to make further investments in production capacity.

Source: http://www.world-nuclear-news.org, 08 January 2015.

INDIA

NPCIL Working Out Commercial Tariff for Kudankulam Power

Kudankulam-1 has been declared a commercial unit from the midnight of 31 December 2014. The significance of commercial generation of power from the first unit at the KNPP is that the NPCIL will start charging money from the SEBs to which it sells the electricity. Kudankulam-1 has been declared a commercial unit from the midnight of 31 December, 2014. "We are working out the tariff per unit that we will be charging from the SEBs," a top NPCIL official said.

The first unit went critical in July 2013. The NPCIL has been selling the generation of this "infirm power" to the State Electricity Boards from July 2013 at Re.1.22 a unit. The NPCIL officials indicated that the sale of power to the SEBs on a commercial basis would be at a much higher rate. R.S. Sundar, Site Director, Kudankulam Nuclear Power Project, said Kudankulam-1 had been generating its full power of 1,000 MWe from December 10, 2014, which meant a generation of 20.4 million units a day. So far, the cumulative number of hours that the unit's turbine generator is in service is 5,266 hours.

The present allocation, as per the stipulation of the Union Ministry of Power, is that out of 1,000 MWe from the first unit, Tamil Nadu will get 562.50 MWe, Andhra Pradesh 50 MWe, Karnataka 221 MWe, Kerala 133 MWe and Puducherry 33.50 MWe.

The present allocation, as per the stipulation of the Union Ministry of Power, is that out of 1,000 MWe from the first unit, Tamil Nadu will get 562.50 MWe, Andhra Pradesh 50 MWe, Karnataka 221 MWe, Kerala 133 MWe and Puducherry 33.50 MWe. "This is as per the latest notification from the Central Electricity Authority," said Mr. Sundar. The turbine blades which were damaged in the first unit a few months ago were replaced with those from the second unit. So the original equipment manufacturers are now providing the second unit with the new blades and the work is being done on them at the BHEL, Hyderabad, Mr. Sundar said. The second unit at Kudankulam, also of 1,000 MWe capacities, will reach criticality in 2015. ... Two more Russian reactors, each of 1,000 MWe capacity, will be built at Kudankulam. The NPCIL again will build them. These third and fourth reactors will together cost more than Rs. 39,500 crores. The Kudankulam site is big enough to accommodate fifth and sixth reactors too.

Source: http://www.thehindu.com, 31 December 2014.

USA

Argonne Unveils Advanced Nuclear Reactor Design Cooperation

The US DOE's Argonne National Laboratory will work with three of the world's leading nuclear products and services companies on projects that could unlock the potential of advanced nuclear reactor designs. The Lemont, Illinois-based laboratory said this cooperation will help create a new generation of safer, more efficient reactors. The three projects partner Argonne with Areva Federal Services, based in Aiken, South Carolina, GE Hitachi Nuclear Energy, based in Wilmington, North Carolina, and Westinghouse Electric Company, based in Cranberry Township, Pennsylvania, to address significant technical challenges to the design, construction and operation of next-generation reactors.

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Areva is partnering with TerraPower Company, Argonne and Texas A&M University to conduct thermal hydraulic modeling and simulations and an experimental investigation for liquid metal-cooled fast reactor fuel assemblies. GE Hitachi is partnering with Argonne to develop an updated safety assessment of the company's PRISM sodium-cooled fast reactor. Westinghouse is partnering with Argonne and the University of Pittsburgh to develop thermo-acoustic sensors for sodium-cooled fast reactors. Argonne said its scientists have been at the forefront of nuclear reactor technology since the lab's founding in 1946 "as the home of the world's first reactors". Research performed at the laboratory over the following decades led to the creation of the current generation of American nuclear reactors, it said.

Argonne scientists and engineers are now working with industry and other national laboratories to provide the technical basis for extending the lifespan of existing reactors. Argonne is also "heavily involved" in research that will enable the next generation of advanced reactors. ...The five industry-led projects will receive $13 million in cost-share agreements to help address significant technical challenges to the design, construction and operation of next-generation nuclear reactors, based on needs identified by industry designers and technical experts. DOE created the program in 2013. The awards are part of the US President Obama administration's "all-of-the-above" energy approach and Climate Action Plan. Funding for the awards is provided by the DOE Office of Nuclear Energy. Argonne is managed by UChicago Argonne for the DOE's Office of Science, the single largest supporter of basic research in the physical sciences in the USA.

Source: http://www.world-nuclear-news.org, 08 January 2015.

The US and its five allies in the talks want to repurpose Fordo to a non-enrichment function because it is believed impervious to a military attack from the air. The six also seek to re-engineer Arak from a model that produces enough plutonium for several nuclear weapons a year to a less proliferation-prone model.

NUCLEAR PROLIFERATION

IRAN

Iran, US Move Closer to Nukes Deal

Negotiators at the December round of nuclear talks drew up for the first time a catalogue of areas of accord and disputes. Iran and the US have tentatively agreed on a formula that Washington hopes will reduce Tehran's ability to make nuclear arms by committing it to ship to Russia much of the material needed for such weapons, diplomats say. In another sign of progress, ...at the December round of nuclear talks drew up for the first time a catalogue outlining areas of potential accord and differing approaches to remaining disputes.

...Iran denies it wants nuclear arms, but it is negotiating with the US, Russia, China, Britain, France and Germany on cuts to its atomic programme in hope of ending sanctions. The talks have been extended twice due to stubborn disagreements. The main conflict is over uranium enrichment, which can create both reactor fuel and the fissile core of nuclear arms. In seeking to reduce Iran's bomb-making ability, the US has proposed that Tehran export much of its stockpile of enriched uranium something the Islamic Republic has long said it would not do. The diplomats said both sides in the talks are still arguing about how much of an enriched uranium stockpile to leave Iran...

...The US insists that it be cut in half, leaving Tehran with about 4,500 present day centrifuges used to enrich uranium, or less if it replaces them with advanced models. Tehran is ready for a reduction of only around 20 per cent, or approximately 8,000 of the machines .... Two other unresolved issues are Iran's Fordo underground enrichment site and the nearly built Arak nuclear reactor. The US and its five allies in the talks want to repurpose Fordo to a non-enrichment function because it is believed impervious to a military attack from the

air. The six also seek to re-engineer Arak from a model that produces enough plutonium for several nuclear weapons a year to a less proliferation-prone model.... Negotiators hope to reach a rough deal by March and a final agreement by June 30.

Source: http://www.thehindu.com, 03 January 2014.

NORTH KOREA

North Korean Submarines Now Able to Fire Missiles

New satellite pictures show that North Korean submarines are equipped to fire missiles, posing a potential new threat to its neighbours. The revelation was made by the American research institute '38 North', based at the John Hopkins School of Advanced International Studies. It comes as Washington ratchets up sanctions against North Korea following a destructive hacking attack against Sony Pictures. North Korea already has a considerable arsenal of land-based ballistic missiles. South Korea's Defence Ministry reported that the North may now have the ability to strike the US mainland because of its progress in missile technology.... The ministry also said the North was advancing in efforts to miniaturise nuclear warheads to mount on such missiles.

North Korea appears to have achieved "a significant level" of technology, miniaturising nuclear warheads to fit on ballistic missiles. These missiles could potentially reach the US mainland.

Nuclear: South Korea's defence ministry claims that the North has evolved its nuclear and missiles threats, and built a 6,000-strong cyber-army. According to a white paper released by the ministry and assessed by Yonhap news agency, North Korea appears to have achieved "a significant level" of technology, miniaturising nuclear warheads to fit on ballistic missiles. These missiles could potentially reach the US mainland.... A December 18 commercial satellite image shows a submarine at dock at Sinpo with a large rectangular opening in its conning tower - the raised turret that juts vertically from the main body of the submarine....

Source: http://www.independent.ie, 09 January 2015.

RUSSIA–IRAN–US

Russia Warns US Sanctions could Damage Cooperation on Iranian Nuclear Standoff

Russia warns US sanctions could damage cooperation on Iranian nuclear standoff

Russia angrily criticized the latest US sanctions, saying they could derail cooperation with Washington on dealing with the Iranian nuclear standoff and the Syrian crisis. Russia-US ties have plunged to post-Cold War lows over Ukraine as Washington has introduced economic sanctions against Moscow for its annexation of Ukraine's Crimean Peninsula and support for a pro-Russian insurgency in eastern Ukraine....

Russia warns US sanctions could damage cooperation on Iranian nuclear standoff Russia angrily criticized the latest US sanctions, saying they could derail cooperation with Washington on dealing with the Iranian nuclear standoff and the Syrian crisis.

The Russian FM on 30 December 2014 dismissed the new US sanctions as unfounded and warned Washington that its actions "are putting in question the prospects for bilateral cooperation in settling the situation around the Iranian nuclear program, the Syrian crisis and other acute international problems.'' ...Russia has cooperated with the US and other global powers on efforts to negotiate a settlement on the standoff over the Iranian nuclear program. Washington has said that Moscow has played a constructive role in the Iranian nuclear talks, despite US-Russian differences on Ukraine and other issues. Russia has staunchly supported Syrian President Assad's regime during the nation's civil war, but Moscow has recently tried to broker talks between the Syrian government and the opposition. The

negotiations have been tentatively scheduled for the end of January.

Source: http://www.stockhouse.com, 01 January 2015.

URANIUM PRODUCTION

Uracan and UEX Begin 2015 Drilling Campaign on the Black Lake Property in the Athabasca Basin

Consolidation is key in today's uranium environment, especially in the US, according to Energy Fuels' (NYSE MKT:UUUU) (TSE:EFR) chief executive officer Antony, who spoke on a conference call about the company's proposed acquisition of Uranerz Energy (NYSE MKT:URZ) (TSE:URZ) earlier today. Antony said the long term dynamics of the uranium market remain positive and that he expects major growth in the uranium industry in the years to come, albeit more measured than the heyday of 2008, as uranium provides base load electricity on a large scale.

The deal will build the only integrated conventional and in-situ recovery (ISR) uranium mining company focused solely on the US, and will have a combined NI 43-101 resource base that will be the largest in the US among producers and near producers.

The chief executive said that by consolidating Energy Fuelswith Uranerz, the companies will become stronger as they can decrease their cost of production, making the combined entity more competitive. About $2 million of combined overhead cost savings are anticipated from the deal. "The transaction will derisk the company from an investor standpoint and for utility customers," said Antony, "as well as provide two distinct production sources and a robust pipeline of future production."

In 2013 and 2014, it was the second largest uranium producer in the US, only behind Cameco.The combined entity will also have six long-term contracts, providing it with downside protection in the event the uranium market does not recover. The longest contract currently in place extends to 2020.

Energy Fuels operates the only conventional uranium mill in the US at White Mesa in Utah, while Uranerz uses a process known as in-situ recovery (ISR) in which a leaching solution extracts uranium from sandstone uranium deposits in the Powder River Basin area of Wyoming. It is the newest uranium producer in the US. In addition to the White Mesa mill in Utah and the Nichols Ranch ISR operation in Wyoming, the combined company is expected to own various development projects located throughout Utah, Wyoming, Arizona and New Mexico. The deal will build the only integrated conventional and in-situ recovery (ISR) uranium mining company focused solely on the US, and will have a combined NI 43-101 resource base that will be the largest in the US among producers and near producers.

Antony, as well as Uranerz's executive chairman Higgs, also emphasized that the merger would result in an improved market profile, with a significantly larger market cap and strong working capital. ...The two executives said the new company's position would be "highly strategic" given its US focus, with the US being the largest consumer of nuclear power with 100 nuclear reactors in operation and five under construction. ...Indeed, the Nichols Ranch ISR project in the Powder River Basin of Wyoming is the most prolific uranium basin in the US, with both Cameco and Uranium One having production operations there. About half of US uranium production 2014 is expected to hail from the Powder River basin.

Under the terms of the deal, Uranerz shareholders will get 0.255 common shares of Energy Fuels for each Uranerz share held, for ownership of 55 percent of the combined company, with Energy Fuels shareholders owning the remainder. The transaction is expected to close in the first half of 2015. Uranerz's Higgs said that Energy Fuels has the "best balance sheet" in the industry by a wide margin, and is a proven uranium producer with 1 million pounds of uranium output per year over the past five years. In 2013 and 2014, it was the second largest uranium

producer in the US, only behind Cameco. The combined entity will also have six long-term contracts, providing it with downside protection in the event the uranium market does not recover. The longest contract currently in place extends to 2020. "Cost savings, diversified production and the combination of premium priced contracts make us a larger, stronger company...

Energy Fuels has embarked on a consolidation path for several years, acquiring the Gas Hills and Roca Honda projects 2014, which are expected to be key development properties for the company as uranium prices increase. Antony said that with Energy Fuels' newly acquired ISR technical expertise, it has opened up a whole new side of business opportunities....

Source: http://www.proactiveinvestors.com, 08 January 2015.

India put up a revised proposal of an "insurance pool" using General Insurance Company (GIC) to alleviate the risk to US suppliers. An earlier proposal had been made during the UPA government's tenure in March 2014, but had been rejected. Officials say the new offer would include a pool of GIC, New India Assurance, Oriental Insurance, National Insurance and United India, that would generate a risk cover of about $242 million.

NUCLEAR COOPERATION

INDIA–USA

Nuclear Logjam: India, US to Work on New Proposals

Indian and US officials are expected to meet in Delhi to discuss two proposals made by India to clear the nuclear logjam, with an added push coming from US President Obama's impending visit on January 24, 2015. ...The proposals were put forward during the first contact group meeting on civil nuclear issues held on December 16-17, 2014 that had been tasked by President Obama and PM Modi with finding a way around US objections to India's supplier liability law. ...India put up a revised proposal of an "insurance pool" using General Insurance Company (GIC) to alleviate the risk to US suppliers.

An earlier proposal had been made during the UPA government's tenure in March 2014, but had been rejected. Officials say the new offer would include a pool of GIC, New India Assurance, Oriental Insurance, National Insurance and United India, that would generate a risk cover of about $242 million. At present, Section 46 says that nothing in the law will "exempt the operator from any proceeding which might, apart from the act, be instituted against the operator." This has been read to mean that US suppliers could face tort claims, that is, be sued by victims of an accident where the nuclear parts are deemed faulty... .

***India's Proposals to US Face Resistance*:** US officials have said they were "hopeful" of some movement in the nuclear deal that has been hanging fire since it was signed in 2008. Although India has allotted project sites for two 1000 mw nuclear reactors each by US companies Westinghouse and GE-Hitachi in Gujarat and Andhra Pradesh respectively, no work has started on either. Indian and US officials are expected to meet in Delhi to discuss two proposals made by India to clear the nuclear logjam. India put up a revised proposal of an "insurance pool" to reduce the risk to US suppliers. A second proposal would entail a "clarification of Section 46" of the law on supplier liability that has been described as "vague."

R.K. Sinha, Chairman of India's Atomic Energy Commission, told...that India was working fast to address the concerns of suppliers.... A similar pool is available to nuclear operators in the US, under the 'Price-Anderson' act. But India's liability law includes suppliers as well. While the insurance pool proposal would help Indian nuclear parts suppliers like L&T, Gammon and BHEL, officials said US company representatives present at the contact group meeting in December found the insurance pool proposal "inadequate" as it would accept supplier liability that the US says is in contravention of the International Convention on Supplementary Compensation....

Source: http://www.thehindu.com, 03 January 2015.

PM Modi to Seek US President Barack Obama's Help for Entry in Nuclear Suppliers Group

PM Modi will utilise US President Obama's India visit in January to seek unequivocal American support to override opposition from certain European nations and China for membership of the coveted NSG in near future. ...Entering NSG is one of the top foreign policy priorities for the Modi government, as reflected in the joint statement issued after the Modi-Obama meet in Washington last September. Key members of NSG including USA, Russia, France, Australia and Japan have been supportive of India's entry into the select club. However, certain European nations and global non-proliferation lobbies are opposing India's entry, officials said, adding that China could also support those who are tying India's membership with either a NSG membership for Pakistan or grant of clean waiver by NSG to Pakistan on the lines of the one granted to India in 2008.

The clean waiver by NSG for India in September 2008 paved the way for several civilian nuclear pacts that the country signed with the USA, France, Russia, Kazakhstan, Mongolia, Namibia, Canada, UK, Argentina and Australia in the subsequent years for supply of reactors, uranium, sharing of know-how and nuclear waste management.

The clean waiver by NSG for India in September 2008 paved the way for several civilian nuclear pacts that the country signed with the USA, France, Russia, Kazakhstan, Mongolia, Namibia, Canada, UK, Argentina and Australia in the subsequent years for supply of reactors, uranium, sharing of know-how and nuclear waste management.... The Modi government wants the US to act similarly when India applies for a membership. "India's non-proliferation track record has been exemplary. But India does not want to apply for the membership until it is certain of support from all NSG members....

Source:http://articles.economictimes.indiatimes.com, 02 January 2015.

NUCLEAR DISARMAMENT

JAPAN

Experts Urge Japan to Play Greater Role in Nuclear Disarmament Process

Ahead of August's 70th anniversaries of the US atomic bombings of Hiroshima and Nagasaki, some experts are calling on Japan to play a greater role in the effort toward global nuclear disarmament. "The Japanese government could be more supportive of reductions (of nuclear arms) than it is," said Cirincione, president of the Ploughshares Fund.... Cirincione said US government officials often stress that President Obama needs support from US allies in pushing his agenda of nuclear disarmament... . "And it would be in 2015," he added, referring to a review conference on the NPT to be held in April and May, as well as the 70th anniversaries of the nuclear bombings.

A world without nuclear weapons is not yet in sight, although the US has reduced its stockpiles of nuclear warheads by more than 80 percent from the peak level in the midst of the Cold War. Nuclear disarmament talks between the US and Russia, which together still account for over 90 percent of all existing nuclear weapons in the world, have stalled.

...A world without nuclear weapons is not yet in sight, although the US has reduced its stockpiles of nuclear warheads by more than 80 percent from the peak level in the midst of the Cold War. Nuclear disarmament talks between the US and Russia, which together still account for over 90 percent of all existing nuclear weapons in the world, have stalled. In 2014, relations between the two countries plunged to their lowest level since the Cold War, due to the Ukraine crisis... . Kimball proposed a nuclear disarmament summit and said, "The year 2015 could be a very good year to start such a nuclear disarmament process," citing the anniversaries of

the atomic bombings. "Japan would be a very logical host country."

Source: http://www.japantimes.co.jp, 04 January 2015.

NUCLEAR TERRORISM

INDIA

DRDO Develops Mobile Lab to Screen Troops in Nuclear Scenario

With threat perception of terrorists using weapons of mass destruction increasing, the DRDO has developed a mobile truck mounted laboratory to screen troops in the field from the after effects of radiation and initiate remedial measures. The chamber, termed as Mobile Whole Body Counter (MWBC) will do away with the necessity and the logistic impediment of evacuating soldiers from operational areas to rear echelons. According to a bulletin issued by DRDO's Institute of Nuclear Medicine and Allied Sciences (INMAS), in case of radiological and nuclear accidents, some radio-nuclides are released, which contaminate the environment for extended periods of time due to their long life.

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Stating that terrorists are fast graduating towards CBRN terrorism and since Indian forces are constantly engaged in anti-terrorist and internal security duties in Jammu and Kashmir, the North-East and Maoist affected areas, the bulletin claims that the chances of use of RDD by terrorists on Army installations are high. Consequently, in order to keep soldiers fighting fit in the event of use of RDDs by terrorist outfits, each soldier suspected of being affected by radiation will be required to screen for radioactive contamination. This would help mitigate any panic in the unit concerned as well monitor therapeutic response.

Source: http://www.tribuneindia.com, 06 January 2015.

NUCLEAR SAFETY

INDIA

Indian N-facilities Under IAEA Safety Umbrella

Paving the way for import of fuel for its nuclear reactors, India will complete the process of placing its civilian reactors under IAEA safeguards.... Sources said the last two reactors- units 1 and 2 of the Narora Atomic Power Station in Bulandshahar in Uttar Pradesh will come under the safeguards of the international atomic energy body.... So far 20 facilities have been placed under IAEA safeguards. These reactors are now eligible to use imported uranium.

This includes unit 1 and 2 of the Tarapur Atomic Power Station (TAPS), units 1 to 6 of Rajasthan Atomic Power Station, units 1 and 2 of KNPP, and units 1 and 2 of Kakrapar Atomic Power Station. In addition to the reactors, the Nuclear Material Store, Away from Reactor (AFR) fuel storage facility, both at Tarapur, the Uranium Oxide Plant, the Ceramic Fuel Fabrication Plant, Enriched Uranium Fuel, Enriched Uranium Oxide Plant, Enriched Fuel Fabrication Plant and the Gadolinia Facility and the entire Nuclear Fuel Complex in Hyderabad have been placed under the IAEA safeguards. ... The development comes ahead of the visit of US President Obama to India, completing the mandatory process under the Indo-US Civil Nuclear Cooperation Agreement. ...

Source: http://www.thehindu.com, 29 December 2014.

JAPAN

Utilities Balk at Safer Storage of Spent Nuclear Fuel to Avoid 'Wasted Investment'

Power companies have resisted government calls to construct safer storage facilities for spent nuclear fuel and are instead waiting for a fuel

reprocessing plant to finally start running after nearly two decades of delays. The utilities say that building dry storage facilities, which hold spent nuclear fuel encased in metal or concrete casks, could prove a waste of money if the Rokkasho reprocessing plant in Aomori Prefecture begins operations and takes all the spent fuel off their hands. They also cite concerns in communities that host nuclear reactors that dry storage facilities could lead to permanent storage there. Under Japan's basic energy plan approved by the Cabinet in April 2014, the central government promotes the construction and use of dry storage facilities.

Power companies have resisted government calls to construct safer storage facilities for spent nuclear fuel and are instead waiting for a fuel reprocessing plant to finally start running after nearly two decades of delays.

Tanaka, chairman of the NRA, has repeatedly referred to the importance of such facilities, which are deemed safer and less expensive to operate than the traditional method of keeping spent nuclear fuel submerged in storage pools at nuclear plant. Spent fuel pools are usually located next to reactors for swift transport because the fuel rods continue to be highly radioactive and emit heat after use. The risk of using storage pools was exposed when all power sources were lost at the Fukushima No. 1 nuclear plant after the Great East Japan Earthquake and tsunami struck on March 11, 2011. TEPCo, operator of the plant, not only had to deal with three reactor meltdowns, but it was also forced to take measures to prevent the release of radiation from spent fuel storage pools at the site.

The start of operations has been delayed 21 times because of technical glitches, human error and safety issues. Japan Nuclear Fuel Ltd., operator of the Rokkasho plant, has postponed the completion date to March 2016. Still, electric power companies do not want to spend on dry storage facilities now because they believe the plant will start running and alleviate them of their spent fuel problems.

Under the dry storage method, the encased spent fuel is cooled with circulating air at a facility built separate from the reactor building. Dry storage is mainly used for spent fuel whose radioactive decay heat has already dropped to a certain level. One big advantage that dry storage has over storage pools is that it can continue to cool spent fuel even after a power failure in the event of a nuclear accident or natural disaster. In fact, spent fuel in a dry storage facility at the Fukushima No. 1 nuclear plant did not suffer any major damage in the 2011 disaster.... The only other nuclear power station currently equipped with a dry storage facility within its plant site is Japan Atomic Power Co.'s Tokai No. 2.... Chubu Electric Power Co. plans to set up a dry storage facility at its Hamaoka nuclear plant in Shizuoka Prefecture in fiscal 2018. That plan was hatched before the Fukushima nuclear disaster.

But no other utility in Japan has moved in that direction despite the government's urging... . Hokuriku Electric operates relatively new nuclear reactors that have more storage capacity for spent fuel than utilities that have run the same reactors for decades. But power companies whose storage space for spent fuel is nearing capacity are also not showing a sense of urgency in constructing dry storage facilities. Kyushu Electric Power Co. and Shikoku Electric Power Co say they are still at the stage of weighing whether they should build such facilities.... The biggest reason the utilities are hesitant to build dry storage facilities is that the government has kept alive the Rokkasho nuclear fuel reprocessing plant project, despite its many problems.

According to the project, the Rokkasho plant will take in the utilities' spent nuclear fuel and reprocess it for reuse at nuclear reactors around Japan. The Rokkasho plant was originally scheduled to open in 1997. However, the start of operations has been delayed 21 times because

of technical glitches, human error and safety issues. Japan Nuclear Fuel Ltd., operator of the Rokkasho plant, has postponed the completion date to March 2016. Still, electric power companies do not want to spend on dry storage facilities now because they believe the plant will start running and alleviate them of their spent fuel problems....

The utilities say they are also concerned that building dry storage facilities could stoke fears among nearby residents and local officials that hazardous spent fuel would remain in their neighborhoods for a prolonged period. Fukui Prefecture is home to 13 nuclear reactors, the most in the nation. The prefectural government demands that spent fuel removed from nuclear power stations in the prefecture be stored at an interim facility outside the prefecture....

Source: http://ajw.asahi.com, 04 January 2015.

LEBANON

Radioactive Goods Seized at Beirut Port, Airport: Minister

FM Khalil on 5 January 2015 said dangerous radioactive components found in industrial and kitchen items recently seized at the Beirut port and airport threaten the lives of Lebanese. "Customs officers at the Beirut port and the Beirut airport have confiscated industrial and kitchen goods that contain dangerous radioactive material [that threaten] public health," Khalil revealed at a news conference. ..."Lebanon will no longer be a dump for toxic waste or a landfill containing radioactive material that is harmful to citizens' health." Khalil vowed to hold the importers accountable. "This case will be referred for investigation and the importing companies will be held accountable and we will also [investigate] other companies to find out whether this similar material had been previously imported".... He called for the formation of an "internal front" to confront those who tamper with the interest of the people.

Source: http://www.dailystar.com.lb, 05 January 2015.

RUSSIA–INDIA

Russia to Provide Safety Solutions for KKNPP 3&4

In the wake of Fukushima Daiichi atomic disaster and enhanced security measures sought by India, Russia is ready to use a number of unique technical solutions for units 3 and 4 of the KKNPP. This will put the implemented project and its nuclear safety almost close to fourth generation projects.

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The two reactors that have already been built at Kudankulam in the Tirunelveli district of Tamil Nadu are advanced models of the Russian VVER-1000 MW Pressurized Water Reactor, which is a leading type of reactor worldwide. VVER is a Russian nomenclature for water-cooled and ater-

moderated reactors. Each reactor is having the installed capacity of 1000 MW. It uses low-enriched uranium fuel in oxide matrix, housed in sealed zirconium-niobium alloy tubes. The first and second units of KKNPP VVER 1000 adopts the basic Russian design with enhanced safety features to make it in line with IAEA GEN III reactors. ...The core catcher is a unique development of Russian scientists. "This is a container installed below the bottom of a reactor vessel. In case of hypothetical accident, the 'core catcher' will be able to contain liquid and hard fragments of nuclear reactor core and parts of materials of which the reactor has been constructed; this prevents damage to containment building and escape of radioactive materials," the official explained. The core catcher was filled with sacrificial materials which cause a number of chemical reactions and enable containment of the moltencore and cooling it for a long time, he added.

The core catcher is a unique development of Russian scientists. "This is a container installed below the bottom of a reactor vessel. In case of hypothetical accident, the 'core catcher' will be able to contain liquid and hard fragments of nuclear reactor core and parts of materials of which the reactor has been constructed; this prevents damage to containment building and escape of radioactive materials.

The first core catcher in the world was installed at the Tianwan NPP in China in 2007. Now Russian nuclear power engineers have installed it at the KNPP. The design of the KNPP fully complies with the strictest requirements of Russian supervisory bodies and the IAEA, as well as considers the nature of the region. The Russian design of the core catcher is unparalleled in the world's NPP construction practice. NIAEP-ASE, the Russian engineering company, is the general designer and contractor of the construction. It is to be mentioned here that India had sought "enhanced security measures" for the KNPP after the Fukushima Daiichi atomic disaster in Japan. "We had received a request from India for enhanced safety measures. Of course India had to pay more for such kind of system. Now, we are in the process to contain Indian government by putting the safety measures of the third and fourth units of KKNPP close to fourth generation plants," the representative said. ...

Source: http://www.indiaprwire.com, 05 January 2015.

NUCLEAR WASTE MANAGEMENT

SCOTLAND–BELGIUM

Last Load of Scottish Nuclear Waste Arrives in Belgium

A final load of nuclear waste from the experimental Dounreay power plant in Scotland has arrived in Belgium. It's the twenty-first such set of spent nuclear fuel and it arrived on Boxing Day, according to Belgium's nuclear regulator, FANC. A shipping container holding three barrels of nuclear waste encased in cement was put into storage in Dessel, at the site of Belgian nuclear energy firm Belgoprocess. The waste, which was originally sent to Scotland from Belgium for reprocessing, will be held in this special bunker temporarily until a final destination is found. It was carried from Scotland by sea and across Belgium to Dessel by rail.

After these drop tests, the cement package also undergoes a fire test at 800°C for 30 minutes and an immersion test, adds the document. The package must be preserved after these tests and its radiation level on the outside must be within international radiation limits.

Is the cement casing safe? The Belgian nuclear authority FANC says the huge concrete cylinders which hold the nuclear waste must have passed rigorous safety tests. In a document explaining the testing process, the FANC says accidents are simulated include two types of "drop tests". One is a "free fall" of

nine metres on a "non-deformable" (i.e. one which is not soft) surface, another a fall of one metre onto a steel point. After these drop tests, the cement package also undergoes a fire test at 800°C for 30 minutes and an immersion test, adds the document. The package must be preserved after these tests and its radiation level on the outside must be within international radiation limits.

Source: http://www.energylivenews.com, 04 January 2015.

UK

Nuclear Power Plant Shut Down After Four Decades of Operation

Vermont Yankee was officially taken off the grid on 05 January 2015, marking the end of 42 years of nuclear power production in Vermont, and ushering in a period of economic uncertainties for Windham and neighboring counties. Just five days before the plant went offline, the UMass Donahue Institute for Economic and Public Policy released a study detailing the economic impacts that the closing is expected to have on the tri-county area, which combines Windham, Franklin County, MA, and Cheshire, NH, counties....

The Vermont Yankee closure will affect the income in the tri-county area by reducing payroll as positions are eliminated and by lowering the investment income of former employees who move away from the region. The plant's draw-down will adversely affect the tri-county region, which was already confronting economic and demographic challenges, even before the announcement of VY's closure.

A history of power, controversy

Vermont Yankee began commercial operations in November 1972 on a 40-year operating license, using the Connecticut River as the cooling source for its General Electric-designed boiling water reactor. Central Vermont Public Service, Green Mountain Power, and other New England utility companies, who had smaller percentage stakes, owned the plant until 2002 when it was sold to Louisiana-based power company Entergy. While Vermont Yankee saw some of its most productive periods of output in the following years, Entergy's 12-year ownership was marred by controversies, and battles with state officials.

In 2006, a cooling tower at the plant collapsed, and in 2010, groundwater at the plant was contaminated by a tritium leak from underground pipes, which Entergy management denied even existed. The Vermont Senate followed up this revelation with a 24-6 vote denying Entergy permission to operate past 2012 when it had to reapply for relicensing through the Federal Nuclear Regulatory Committee. A federal judge struck down the ban, however, and Entergy acquired their NRC license, planning to continue operations at the plant through 2032. ...

... Citing economic factors, including the cheaper option provided by natural gas, Entergy announced that VY would close after the final quarter of 2014. At 12:12 pm on 05 January 2015, the decommissioning of the nuclear steam turbine plant began, with boron control rods inserted into the boiling water reactor core to stop fission reactions and cool the reactor's water. Tri-county economic impact on 05 January 2015 was simply the first day in a decades-long decommissioning project, a process Entergy reports will cost $1.24 billion, and may not be finished until 2040. This process will consist of multiple stages of nuclear waste management and deconstruction, each one accompanied by a significant reduction in plant employment. Windham County employs the largest number of plant workers with 204, followed by Cheshire County, NH, with 176, and Franklin County, MA, with 101.

... "The Vermont Yankee closure will affect the income in the tri-county area by reducing payroll as positions are eliminated and by lowering the investment income of former employees who move away from the region. The plant's draw-down will adversely affect the tri-county region, which was already confronting economic and demographic challenges, even before the

announcement of VY's closure," concluded the report. ...

Source: http://www.dvalnews.com, 01 January 2015.

USA

States Look to Emulate North Dakota's Rules for Radioactive Waste

In developing a detailed set of rules for radioactive waste disposal, North Dakota is going where no state has gone before. Oil and gas development in what's generically called the Bakken shale formation has resulted in a deluge of radioactive waste unlike anything known before in the state's industrial history. In modern regulatory history, it worked to have a rule that set the allowable disposal limit at 5 picocuries per gram.... But the Bakken is creating new history, along with an excess of 1 million barrels of oil per day. Because the oil is extracted from very deep and very old formations, drilling concentrates radiation that occurs naturally in the soils below. The concentrations show up on filters, pipes, proppants used in hydraulic fracking and tank sludge.

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***Levels Pile Up*:** The resulting technologically enhanced naturally occurring radioactive material, or TENORM, is not generally red hot. But the 75 tons of radioactive waste generated daily by oil and gas development in the Bakken is well beyond that safe-for-daycare range, and the state's sampling finds readings from 8 pCi to as high as 9,800 pCi. It appears most oil companies act responsibly and transport their radioactive waste to approved landfills in Montana, Colorado or Idaho, but not all do. Ugly and widely publicized instances of illegal radioactive waste dumping has put pressure on state officials. They concluded the state needs to change its rules and create a reasonable radioactive waste disposal program here and rules to keep track of it.

...Under proposed new rules, specialized oil and gas waste landfills will be able to apply for a modified permit to accept and bury waste with readings up to 50 pCi. There are 10 of those landfills in the oil patch and a few more in development. The rules require that landfills meet specific construction standards and radioactive waste be covered daily and deep-covered permanently. The new rules also will require oil companies to keep track of where and how the waste is generated and where it's disposed of with the result that there is cradle-to-grave accountability. If all goes as planned, the new rules have to be recommended by the department's citizen advisory board and approved by the Legislative Administrative Rules Committee, they could be in play this fall.

There are 10 of those landfills in the oil patch and a few more in development. The rules require that landfills meet specific construction standards and radioactive waste be covered daily and deep-covered permanently. The new rules also will require oil companies to keep track of where and how the waste is generated and where it's disposed of with the result that there is cradle-to-grave accountability.

The public can comment on the proposed rules until 06 February 2015.... "The oil companies knew that was the deal when they started drilling here," said Dorgan, suggesting that there should be an audit of waste already generated before the state raises the bar.

***New Ground*:** North Dakota may not only raise its own bar for radioactive waste, it may set management practices for other states to emulate. There is no similar model out there. In researching, Radig said he found that many states are at 5 pCi, or they don't have detailed

rules, while others, such as Utah and Montana, have permits or policies that apply to just one private operator. Texas allows operators to spread their radioactive waste at the well, provided the soil mix doesn't exceed 30 pCi....

Wyoming: Bob Breuer manages inspection and compliance for Wyoming Department of Environmental Quality in Wyoming. The state produces far more natural gas than oil and, so far, has no oil-producing shale like the Bakken. Landfill operators there can take up to 50 pCi, like North Dakota proposes, but there are no state statutes or rules, just a guidance document published four years ago. Nor is there any enforcement authority, Breuer said. Instead, the program depends on reputable oil and gas companies and alert landfill operators to refuse waste unless it's tested for radioactivity. ...Normally, high TENORM concentrations come after years of oil production, on old scaly pipes or in tanks used a long time. In the Bakken shale, the high numbers showed up almost immediately. Breuer said his agency is planning a series of inspections this year to test the TENORN in Wyoming landfills.

***Utah*:** ...State has one privately owned facility that, since the early 2000s, can take Class A radioactive waste, a low level on that scale but one that does include materials from nuclear power plants. Lundberg says there is great concern that radioactive materials are handled properly....

***Future for Landfills*:** The health department says most of the oil and gas waste generated in the Bakken does not exceed the proposed 50 pCi maximum and thus, will be eligible for disposal here, at least for the foreseeable future... .

Source: http://bismarcktribune.com, 04 January 2015.

Centre for Air Power Studies

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

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