



NUCLEAR SECURITY



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

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OPINION – Edward H. Klevans

Nuclear Power's Time Has Come

Something new and promising is happening with nuclear energy in the United States. A belief that nuclear technology is dispensable is giving way to a new measure of its worth – the proposition that it is playing a quiet yet effective role in reducing global-warming emissions.

The evidence can be found in New York state's farsighted decision to reward nuclear plants for their chief advantage in electricity production: They produce zero carbon emissions. Due to a clean-energy standard approved by the state's Public Service Commission and backed by Gov. Andrew Cuomo, a credit can be paid to nuclear plants in upstate by utilities that use their power. This payment is part of an effort to wean the state off fossil fuels and save reactors battered economically by competition from cheap natural gas.

Growing concern over climate change has become a critical element in state-level discussions of nuclear energy's future. Four reactors are under construction in the Southeast – two each in Georgia and South Carolina – and a fifth is nearing completion in Tennessee after a long delay.

While there are no firm plans to build more, as many as 50 nuclear companies are developing designs for a new generation of advanced nuclear

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CONTENTS

- ☞ OPINION
- ☞ NUCLEAR STRATEGY
- ☞ BALLISTIC MISSILE DEFENCE
- ☞ NUCLEAR ENERGY
- ☞ NUCLEAR COOPERATION
- ☞ NUCLEAR DISARMAMENT
- ☞ NUCLEAR PROLIFERATION
- ☞ NUCLEAR NON-PROLIFERATION
- ☞ NUCLEAR SAFETY
- ☞ NUCLEAR SECURITY
- ☞ NUCLEAR WASTE MANAGEMENT

plants, including small modular reactors that could be built in factories for a fraction of the cost of today's large nuclear plants.

Most of this activity is being funded privately, and it includes work on a so-called traveling wave reactor that, theoretically, could be self-sustaining and run for decades without refueling or removing spent fuel. Traveling-wave advances are being financed largely by Microsoft founder Bill Gates, who has become a vocal supporter of nuclear energy.

Many environmentalists believe wind and solar energy can be scaled up to meet the need for emissions-free power. But, even with federal tax credits and state mandates for renewable energy

sources, wind and solar combined account for just 7 percent of the nation's electricity supply. If renewables can't do more to cut carbon emissions in this country, energy analysts have concluded there is little prospect of wind and solar making much of a dent in countries like China and India that still rely heavily on coal.

A few well-known environmentalists now support nuclear energy. Stewart Brand, author of the iconic Whole Earth Catalog, once opposed nuclear energy but now says it is essential in the battle against climate change. Another onetime critic is Carol Browner, a former top environmental adviser to President Barack Obama, who is now actively involved in keeping existing nuclear plants in operation.

A lot of other people are coming to see nuclear energy's value. And, despite short-term challenges for nuclear energy – since 2014 electricity companies have either shut down or announced plans to close 10 reactors, and at least 15 other reactors are considered at high risk of being shuttered – the long-term prospects for nuclear energy in America remain strong.

Here in Pennsylvania, nine reactors produce 93 percent of the state's carbon-free electricity, and they're the only clean-air sources that produce electricity around the clock. Over the past three years, Pennsylvania's nuclear plants on average generated electricity 92 percent of the time, according to the Energy Information Administration. The most efficient reactor, Three Mile Island unit one in Middletown, produced electricity 99 percent of the time, among the highest capacity factors of any nuclear plant in the world.

In short, there is an overwhelming case for continued reliance on, and expansion of, America's

nuclear energy infrastructure. But will Pennsylvania and other states with nuclear-generating capacity be able to save plants that are at risk of shutdown? Or build new ones? The good news is that the discussion seems, finally, to be moving in the right direction. Ten years ago, the debate over nuclear energy was fixated on plant safety and nuclear waste. Today, not so much. Nuclear energy is not the problem. It is part of the solution to global warming, the overarching environmental problem of our time.

Source: Edward H. Klevans is professor emeritus of nuclear engineering at Penn State University. <http://www.post-gazette.com>, 12 August 2016.

OPINION – M. Thomas Davis

Why a Common Missile Nuclear Missile Design is Poor Acquisition Strategy

The bill to modernize the nuclear Triad's three legs will be hefty, estimated at a total cost of over \$300 billion in today's dollars. To ease this fiscal burden, the Navy is advocating a "smart" commonality approach, sharing designs and components between the Air Force Ground Based Strategic Deterrent (GBSD) and Navy's new submarine-launched ballistic missiles. This proposal seeks to achieve modernization of the two missile legs of the Triad at a lower cost.

This seems practical, considering the first of the Ohio-class nuclear submarines will be retired in 2027, the Minuteman ICBM is nearly 50 years old and will need to be recapitalized by the early 2030s, and our B-52H bomber fleet will be 75 years old by the time the new B-21 bombers reach initial operating capability in the mid-2030s. But the logic is fraught with acquisition and operational risks. Historically, the promises of cost and time savings from

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commonality have proved elusive. Indeed, commonality-driven programs have often led to cost overruns, schedule slips, and cancellations — the exact outcomes the Department of Defense is seeking to avoid when time and money are running short. A common design is predicated upon a common requirement across participating services. But there are vast differences in operating environments between the Trident's deep blue sea and Minuteman's underground silos adjacent to mid-western cornfields.

In fact, difficulty developing common requirements is a major reason why many joint programs either fail to materialize or stumble in execution. Take for example the 1960s tactical-fighter experimental (TFX) initiative meant to introduce a common tactical fighter platform. The difficulty of settling on a single one-size-fits-all set of requirements eventually forced the TFX to break up into several different aircraft programs, including the A-10, A-7, AV-8B, F-111, and F-14. Similarly, the F-16 and F-18 were originally conceived as a single common light-weight fighter program before the services parted ways. Unfortunately, lessons encountered are not always lessons learned, and the F-35 program, pursuing a common fighter for the Navy, Air Force, and Marine Corps, has also been plagued by delays and cost overruns.

A good acquisition strategy seeks to lower costs and speed schedules. To avoid systems failures, Minuteman III must be recapitalized in the early 2030s, leaving about 15 years to develop, test, and produce GBSD. But if the Air Force and Navy pursue a common design—assessing the proposed design, re-evaluating requirements, and conducting trade-off analyses—the acquisition schedule will slip. However, as the Air Force is advancing to the technical maturation and risk reduction stage of GBSD, the Navy has not released

any technical details to the Air Force.

Perhaps most troubling, however, is the fundamental risk this approach introduces to our nuclear posture. A common missile design undermines the Triad by introducing interdependencies between two of the three legs. For decades, the US and Russia have maintained sea, air, and ground-based legs of their strategic nuclear forces to preserve an assured second strike capability. The deadly logic is that an

adversary will be deterred from launching a surprise nuclear attack if it believes that the other party has the ability to launch an equivalent retaliatory strike. Key to preserving a second strike capability and strategic stability is maintaining three separate and independent legs of the Triad, ensuring that if one leg were compromised, the remaining legs would still stand ready. Safeguarding that independence has in

the past led the US to rule out common missile designs between the ground and sea legs, thus preventing a single point of failure.

In that light, a common design with identical components creating interdependencies between the missile legs of the Triad appears unwise. Stand-downs of entire fleets owing to defects or component failures are not uncommon. Virtually every major aircraft weapons system has been grounded over the years, including the F-22, F-35, F-16, F-117, F/A-18 and B-1. Should a common missile component fail on a new generation of long-range missiles, it would adversely impact approximately 75 percent of the US nuclear deterrent, forcing the US to rely entirely—even if just temporarily—on its limited bomber fleet.

Moreover, given all the trouble and risks endemic to common designs, this proposed approach saves relatively little—perhaps \$600 million dollars in acquisition costs or less than 0.7 percent of the

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anticipated GBSB cost. In effect, the Navy is asking the Air Force to gamble that absorbing new cost and schedule risks associated with commonality may result in some marginal program savings. This is a far cry from savvy acquisition practice.

In sum, a common design for the new ICBMs and SLBMs would do little in the way of cost savings, but do much in spoiling the chances of delivering a timely, effective, and affordable replacement for the Minuteman III. A good acquisition strategy outfits the warfighter with needed capabilities at acceptable prices. A smart acquisition strategy would achieve the same capability at lower than expected costs. The commonality approach being advocated for the acquisition of a new generation of Air Force and Navy strategic missiles does neither.

It was also the realization that diplomatic engagement with Pyongyang was no longer a viable solution, combined with heightened concern over North Korea's growing nuclear and missile threat and a greater willingness to push China for more extensive sanctions. The UN, the EU, the US and other countries have begun to implement long-overdue punitive measures to enforce laws, curtail proliferation and raise the cost for Pyongyang's continued defiance of the international community.

Source: <http://www.defensenews.com/>, 23 August 2016.

OPINION – Bruce Klinger

Fourth North Korean Nuclear Test Shows Need for Harsh, Sustained Sanctions – Not Diplomacy

This January, North Korea conducted its fourth nuclear test. Though not significantly larger than the previous tests, it triggered a stronger international response than any of its first three, the result of an international consensus that stronger, more comprehensive sanctions must be imposed for serial violations of its agreements, UN resolutions and US law. Resolution 2270, approved in February, goes beyond previous UN actions by increasing financial sanctions, expanding required inspections of North Korean cargo and targeting key exports. The resolution is the first instance of UN targeting of North Korean commercial trade, including mineral exports.

What triggered this international consensus was not just cumulative anger and frustration over North Korea's repeated violations. It was also the realization that diplomatic engagement with Pyongyang was no longer a viable solution, combined with heightened concern over North Korea's growing nuclear and missile threat and a greater willingness to push China for more extensive sanctions. The UN, the EU, the US and

other countries have begun to implement long-overdue punitive measures to enforce laws, curtail proliferation and raise the cost for Pyongyang's continued defiance of the international community. Imposing the enhanced punitive measures is a welcome step toward sharpening North Korea's choice between its nuclear program and economic isolation.

Moreover, the augmented sanctions will fulfill near-term objectives of enforcing laws, imposing penalties on those who violate them, and strengthening measures to constrain the importation and proliferation of prohibited nuclear and missile technology. That all of these measures could have been implemented years ago is testament to a collective lethargy about confronting North Korean belligerence. The utility of the sanctions, however, depends on complete and forceful implementation, particularly by China. Beijing agreed to the tougher UN measures, and Chinese banks and businesses on the border with North Korea appear to be acting accordingly.

However, previous Chinese backsliding on sanctions enforcement raises doubts as to how long Beijing will remain onboard. After each of North Korea's previous nuclear tests, Beijing temporarily tightened trade and bank transactions with Pyongyang but eventually became

lackadaisical with enforcement, severely undermining the sanctions. Beijing's reluctance to strongly pressure its ally gives Pyongyang a feeling of impunity that encourages it toward further belligerence. China's timidity, and the international community's willingness to accommodate it, only ensures a continual repetition of the cycle with ever-increasing risk of escalation and potential catastrophe.

For years, the Obama administration was not fully enforcing US laws and regulations on North Korean sanctions. Rather than using its full authority to target North Korean violators, the administration pulled its punches. This timid incrementalism frustrated Congress to the point that lawmakers passed the North Korea Sanctions and Policy Enhancement Act in February to induce presidential punishment. Certainly, the rhetoric has changed. After years of extolling China for assisting US policy toward North Korea, the Obama administration now criticizes Beijing for being unhelpful. But the administration has not included a single Chinese entity on the US sanctions list for facilitating North Korean violations. It is past time for the US to impose secondary sanctions against Chinese violators.

At present, any offer of economic inducements for North Korea to abandon its nuclear arsenal is ill-conceived with little chance of success. Little change will occur until North Korea is effectively sanctioned and China becomes concerned about the consequences of Pyongyang's actions and Beijing's own obstructionism. Washington needs to stay the course on sanctions while increasing China's carrying cost for appeasing North Korea. Indeed, Washington must sharpen the choice for North Korea by raising the risk and cost for its actions as well as for those of its enablers – particularly Beijing – who have willingly facilitated the regime's prohibited

programs and illicit activities and condoned its human rights violations.

Source: <http://www.washingtontimes.com/>, 22 August 2016.

OPINION – Chicago Tribune

Keep America's Foes Guessing: Why Obama Shouldn't Curb US Nuclear Options

For decades, one aspect of American nuclear policy has been deliberately vague: Would the US ever strike first with a nuclear weapon? Maybe yes. Maybe no. Now President Obama might end the guessing game. He may reverse US policy and tell the world that America will never strike first with a nuclear weapon. That terrible idea has been rattling around since Obama declared in a 2009

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speech that he would "seek the peace and security of a world without nuclear weapons." "As a nuclear power – as the only nuclear power to have used a nuclear weapon – the US has a moral responsibility to act," he said in Prague. "The US will take concrete steps towards a world without nuclear weapons." Lo and behold, a few months before he leaves office, Obama is reported to be mulling this concrete step. We say: Step back, Mr. President.

Broadcasting a constrained strategy, with fewer nuclear options in future situations that this generation of US leaders can't possibly envision, would be welcome news in Tehran. And Pyongyang. And Moscow. And everywhere the enemies of America plot. That's why this idea deserves to fizzle in its silo. Secretary of State Kerry stands against declaring No First Use, The Wall Street Journal reports. So does Secretary of Defense Carter. And Secretary of Energy Moniz. US allies Japan, South Korea, Germany, France and Britain all reportedly have lobbied against clearing away a strategic smoke screen

US allies Japan, South Korea, Germany, France and Britain all reportedly have lobbied against clearing away a strategic smoke screen designed to keep potential enemies off balance — to keep them wondering: If we make this move, might the Americans go nuclear? But others think virtue should override a potential first-strike advantage.

designed to keep potential enemies off balance — to keep them wondering: *If we make this move, might the Americans go nuclear?* But others think virtue should override a potential first-strike advantage. “The allies lobbying against it are nervous Nellies,” Cirincione, president of the anti-proliferation Ploughshares Fund....

Nervous Nellies? Hardly: They’re realistic leaders who know Obama’s vision of a nuclear-free world may look good etched into a wall of achievements in his soon-to-be-built presidential library in Jackson Park. But come January, he’ll be in political retirement – and the heads of other Western governments still will be in office. These US allies rely on the American nuclear shield, the overwhelming destructive force of the US arsenal. But part of keeping that arsenal potent is preserving the element of surprise. Enemies can’t be sure whether the US – detecting, say, a chemical or biological attack – would or wouldn’t deploy nuclear weapons. Nor should the US ever be so predictable or its enemies so secure: Knowing that Washington would go nuclear only if attacked by nuclear weapons would give a foe a tremendous advantage.

Taking America’s first-strike capability off the table would leave these allies facing (at least) four dangerous realities:

- Nuclear outlaw North Korea builds its arsenal, fires off a series of nuke tests and advances toward a nuclear-tipped missile capable of striking the US
- Iran may eventually shoulder its way into the nuclear club, despite last year’s agreement to curb Tehran’s nuclear program.
- Pakistan’s growing nuclear arsenal is a major target for terrorists, who have attacked heavily guarded nuclear facilities, often seeming to have insider help.

- Islamic State leaders may follow the path of Osama bin Laden, seeking nuclear materials for a so-called dirty bomb.

Anyone heard North Korean dictator Jong Un deliver a pledge to keep his pudgy fingers off the red button? Would Iran’s supreme dictator Khamenei, once he or a successor commands a nuclear arsenal, reassure his enemies of his intentions? Can you imagine Russian President Putin limiting his options that way? Please. A US guarantee to never strike first would undercut our

allies’ confidence in US security guarantees – a change likely to have its own repercussions for this nation. It could encourage some countries, including possibly Japan, to develop their own nuclear programs. Adversarial regimes that today would think twice about launching some non-nuclear offensive – a devastating assault on America’s electrical grids? – might calculate those risks differently if they knew that Washington had pledged

only a non-nuclear response.

A first strike is horrific to contemplate. So is a second strike. Unpredictability, by contrast, is a valuable asset. So is the freedom to act as circumstances dictate: Remember, it was a first and second strike that ended World War II and saved untold numbers of American lives. Fortunately, President Harry Truman didn’t have to wait for someone else’s first strike against the US. This nation’s overwhelming nuclear strength, and the willingness to use it whenever and wherever the president deems necessary, has comforted America’s allies and intimidated its enemies for seven decades. Telling US adversaries how and when we would use, or not use, these fearsome weapons turns a dangerous world even more treacherous.

Source: <http://www.chicagotribune.com>, 23 August 2016.

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OPINION – Diana Olhbaum

US Nuclear Policy Remains Dangerously Stuck in the Past

Republican nominee Trump has been ridiculed for asking “Why can’t we use nuclear weapons?” and castigated for his cavalier attitude toward their use. But he is only restating, albeit less artfully, what is, in fact, the standard orthodoxy: that the US needs nuclear weapons not only as a deterrent to aggression, but as a plausible option for achieving strategic aims. Those who grew up in the era of the “Doomsday Clock” and “duck and cover” might assume that the days of mutual assured destruction and launch under attack were swept away with the Soviet Union. They would be wrong. America’s nuclear weapons remain on hair-trigger alert, and the commander in chief has not ruled out being the first to use them.

For all his talk about a “nuclear free world,” President Obama has proposed a \$1 trillion modernization of the nuclear arsenal. Republicans, having engineered the demise of the Anti-Ballistic Missile Treaty, are intent on ramping up US nuclear defenses. The nuclear “football” still follows the president everywhere, enabling a cataclysmic strike to be launched on a moment’s notice. Twenty-five years after the end of the Cold War, US policy remains stuck on the same horrifying premise: that US national security depends on its willingness to use nuclear weapons.

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Seventy-one years after the US dropped atomic bombs on Hiroshima and Nagasaki, Japan, residents are still developing cancerous tumors that can be linked to radiation exposure. New evidence suggests that a nuclear exchange would produce far more serious harm to public health than previously imagined. The US has made drones its “weapon of choice” in the war on terror in large part because of its obligation under international law to take “all feasible precautions” to avoid and minimize incidental loss of civilian life, injury to civilians and damage to civilian infrastructure.

The problem is, who but a madman would ever do so? First, the danger of escalation is simply too great. Whether the US used nuclear weapons preemptively, or simply responded in kind, could it count on a nuclear power such as Russia or China to stand down and give in? There is no scenario more unimaginable than the US taking the chance of setting off a chain reaction that ends in total annihilation.

Second, the humanitarian and environmental risks are unacceptable. Seventy-one years after the US dropped atomic bombs on Hiroshima and Nagasaki, Japan, residents are still developing cancerous tumors that can be linked to radiation exposure. New evidence suggests that a nuclear exchange would produce far more serious harm to public health than previously imagined. The US has made drones its “weapon of choice” in the war on terror in large part because of its obligation under international law to take “all feasible

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Third, the world is in a different place than it was when US nuclear doctrine was conceived. Globalization – for better or worse – has interlocked America’s economic fate with that of its former adversaries. Over the past quarter-century, ideological differences have receded, US trade relations with Russia and China have

become normalized, and profound cultural, educational, scientific and human ties have been forged. Climate change, mass migration and pandemic disease have brought wide recognition

of the interdependence of the planet. And disastrous US interventions in Afghanistan, Iraq and Libya have plainly demonstrated the limits of what can be achieved with military power, no matter how shocking or awesome it may be.

Envisioning Donald Trump's finger on the nuclear button helps us to understand how poorly the country is served by its absurd nuclear procedures, which allow a single individual, acting alone and instantaneously, without the benefit of full information or consultation, to order a nuclear attack that could end life as we know it. President Obama has a moral obligation to his country, and the world, to dismantle the "use it or lose it" system designed for a bygone era, and to declare that the US will never be the first to use nuclear weapons.

The US NRC has been waiting since 2014 for applications for design certification licenses for small modular reactors—smaller versions of the large and extra-large operating light-water reactors, with additional safety features. Such plants, which could be factory-built and snapped together on site, hold the promise of providing cheaper nuclear power in a more distributed fashion. Other designs are on the horizon, including molten-salt reactors, which are promising but won't be ready for decades.

Source: <http://thehill.com>, 23 August 2016.

OPINION – Allison Macfarlane

Nuclear's Glacial Pace

Climate change has forced us to rethink how we get electricity. Use of renewable sources like solar and wind is rapidly increasing, while nuclear, though long a reliable source of carbon-free electricity, is not. Meanwhile, a number of startups are promising cheap, safe, proliferation-resistant nuclear energy in the next decade. Can these startups fulfill their promises? Outside of China, nuclear power is expanding nowhere. China has 21 new reactors under construction; Russia has nine, India six. The US is bringing five new plants online, but since 2012, five other reactors have been retired, with seven more to be shuttered by 2019. California's Diablo Canyon plant recently announced it will close by 2025. With other plants closing in Japan, Germany, and the UK, more reactors may be decommissioned

than built in the near future.

So why is this happening? Because it's expensive and time-consuming to design and build a new nuclear plant, and there are cheaper, easier alternatives. The US NRC has been waiting since 2014 for applications for design certification licenses for small modular reactors—smaller versions of the large and extra-large operating light-water reactors, with additional safety features. Such

plants, which could be factory-built and snapped together on site, hold the promise of providing cheaper nuclear power in a more distributed fashion. Other designs are on the horizon, including molten-salt reactors, which are promising but won't be ready for decades.

In 2015, the General Accountability Office reported that it takes 20 to 25 years to develop a new reactor in the US – 10 years

for the design phase, 3.5 years for a design certification license from the NRC, four years for a combined operating license, and another four years for construction. And that's only in an ideal world where no unexpected problems occur. The GAO also found that it's not cheap to bring a design to fruition: just to reach the design certification point costs somewhere between \$1 billion and \$2 billion, and only about \$75 million of that is NRC fees. There's a reason it takes so long and costs so much: manufacturers need to confirm that the design is safe and secure.

Some people blame the regulators for holding up the plants. Yet the NRC hasn't been presented with any applications for new reactors and probably won't be for years. Data from prototype plants would be helpful, but then many of the "new" designs are not so new at all. Sodium-cooled fast reactors have been built by countries including the US, Japan, Russia, Germany, France, and India since the 1950s, but no country has been able to make a

plant cheap and reliable enough to even come close to being a viable energy source. Yes, new nuclear technology can provide carbon-free electricity. But it has to do more than that. It has to be safe, secure, and resistant to proliferation. It has to compete in the marketplace. New nuclear designs are promising, but they're no short-term solution to the climate problem.

Source: *www.technologyreview.com*, 23 August 2016.

OPINION – Russell Ray

Nuclear Power: A “Public Necessity”

More than a dozen US nuclear power plants have either closed, are in the process of closing or are at high risk of closing. What's more, about half of the nation's nuclear plants are no longer profitable. What gives?: Nuclear power is the best option for meeting the nation's clean energy goals. Consider this: Nuclear power accounts for 57 percent of the nation's zero-carbon electricity, according to the US Energy Information Administration. Yet, the business of nuclear power is collapsing because the market cannot support the nation's available capacity. Why?

Simply put, it comes down to supply and demand. A lot of low-priced natural gas-fired generation has flooded the market while regional demand for power is either flat or in decline. In addition, power prices are so low that some nuclear plants can no longer cover basic operating costs. Two Illinois nuclear plants – Clinton and Quad Cities – have lost a combined \$800 million over the last six years. In a battle against climate change, laws and policies must acknowledge nuclear power as the most important source of carbon-free electricity. State standards for renewable power should be changed to zero-carbon standards that recognize nuclear resources.

New York is the first state to offer support to an industry struggling to stay afloat. Earlier in August,

state regulators approved the Clean Energy Standard (CES). Other states should follow suit with similar measures. The CES encourages the use of nuclear and renewable power by mandating a 40-percent reduction in greenhouse gas emissions by 2030. The plan also requires power providers to get half of their power supplies from clean and renewable resources by 2030. Most importantly, the rule would pay the state's nuclear plants up to \$965 million in zero-emission credits. As a result of New York's action, Exelon Corp. said it would invest about \$200 million in two New York nuclear plants next year and continue its discussions to buy Entergy's Fitzpatrick nuclear plant, which was scheduled for closure in 2017. Exelon operates two nuclear plants in upstate New York – Ginna and Nine Mile Point. “Without the CES, these plants would have been at risk of closure,” Exelon said.

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Wind and solar power developers have benefited for years from state and federal subsidies because of their carbon-reducing effects on climate change. Nuclear power plants deserve a modest subsidy

for the same reason. The New York Public Service Commission, which approved the CES, described it as a “public necessity” that would benefit the state's grid, its customers and the environment. New York's decision “will encourage other policymakers and regulators to similarly value nuclear energy for its clean-air benefits,” said Browner, former administrator of the US Environmental Protection Agency and a member of Nuclear Matters, a bipartisan nuclear advocacy group. However, there are no signs that other states are ready to take similar action.

In Illinois, state lawmakers shelved legislation that would have funded the state's struggling nuclear plants to help meet its clean-energy goals. The state's inaction led Exelon to announce plans to close two nuclear plants – Clinton and Quad Cities – in 2017 and 2018. One day before New York regulators approved the CES, lawmakers in Massachusetts approved legislation requiring

power providers to get 40 percent of their electricity from renewable resources by 2030. The measure did not include nuclear power. In fact, the state's lone reactor, the Pilgrim Nuclear Power Station, will be shut down in 2019. It is one of several nuclear plants that have either been closed or slated for closure since 2014. Meanwhile, the fate of nuclear plants in other states hangs in the balance as officials debate the cost, safety and importance of nuclear power in the US.

Source: <http://www.power-eng.com/>, 23 August 2016.

OPINION – John Ryan

Nuclear Power: Safety is a Key Factor to Industry Growth

There are about 7,304 operational power plants in the US utilizing diverse technologies such as gas, coal, wind, solar, hydro and nuclear. All of these power facilities ultimately support 124 million households. Reliability and safety are key drivers for power plant operators... As you may know, there are 438 nuclear plants in operation around the world, 61 of which are located in the US Nuclear power has been part of the grid since 1954.

We are all familiar with the three biggest nuclear accidents: Three Mile Island in 1979; Chernobyl in 1986; and Fukushima in 2011. Unfortunately, there have been at least 99 accidents since 1954 that resulted in loss of life or damages in excess of \$50,000. Since the Fukushima incident, a 12-mile exclusion zone circles the power plant and people

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have limited access to the site. Ultimately, 50,000 households and 156,000 people were permanently displaced.

An NRC task force investigated the Fukushima incident and ultimately concluded that current operating standards "do not pose an imminent risk to public safety and health," which to me is a roundabout way

of saying "we doing it right." However, the task force did pull together a list of over 10 new recommendations as a result of Fukushima. Some of those include strengthening defenses against flooding and earthquakes, and hardening vents that carry away hydrogen gas from damaged reactor cores. Backup electric power for extending plant's capabilities to project reactors and spent fuel was another of the recommendations that was a result of this investigation.

Highlighting the worst nuclear incident in 25 years illustrates the worldwide commitment to safe, responsible generation. Operators use advanced equipment to monitor their reactors 24 hours a day. Located in Illinois, for example, the Dresden Generating Station has been in continuous operation since 1960. Its first unit, Dresden 1, was retired in 1978. Units 2 and 3 — two GE BWR-3 reactors — have been in operation since 1970. This plant safely generates power for over one million households. Its staff have taken reactors offline as necessary when, for example, it detects elevated water levels in a reactor.

The US NRC provides regulatory oversight for plants like Dresden. This framework has three

There are currently more than 15 applications for new nuclear power facilities. Proposed sites are in Texas, Florida, New Jersey, North Carolina and other states. The last newly built reactor in the US came online in 1996. The next reactor, Watts Bar 2, entered service in mid-2016 in Tennessee. This \$4.7 billion unit has undergone several design modifications, all of which were spurred by the Fukushima incident.

major pillars: Reactor Safety; Radiation Safety and Safeguards. Key staff are rigorously trained in segments that include initiating events, mitigating systems, barrier integrity, emergency preparedness, public radiation safety, occupational radiation safety, and physical protection. There are currently more than 15 applications for new nuclear power facilities. Proposed sites are in Texas, Florida, New Jersey, North Carolina and other states. The last newly built reactor in the US came online in 1996. The next reactor, Watts Bar 2, entered service in mid-2016 in Tennessee. This \$4.7 billion unit has undergone several design modifications, all of which were spurred by the Fukushima incident.

We predict the commissioning of more nuclear power plants in the US over the next 20 years. Currently nuclear accounts for 20 percent of all US generation, the third highest source. Coal, the top source, generates 40 percent of our power, but is projected to decrease over the next 20 years. Safety training will continue to play a key role in the nuclear sector to ensure adherence to protocols and regulations that have been in place for over 50 years. In addition to the onsite training that the power companies provide, the NRC provides an ongoing list of training courses on topics that include environmental monitoring and materials control and security systems.

Source: John Ryan is US Regional Vice President, TRANSEARCH International; <http://www.power-eng.com/>, 23 August 2016.

NUCLEAR STRATEGY

INDIA

Arms Control Association: India's Nuke Policy Aimed at China

The Arms Control Association, a US-based national non-partisan-membership organisation, has revealed in its latest report that India's nuclear policy is aimed at China, and not Pakistan. The

co-authors of the report, titled 'The Threat Assessment Brief for Asia', have made the revelation after closely monitoring nuclear policies of three Asian powers. According to Thielmann and Logan of the Princeton University, India considers China as its main rival in the region, while Pakistan considers India as its main enemy and China considers the US as a major

threat. The co-authors have said that the three Asian powers have also taken necessary steps to safeguard their territories from their 'enemies'.

They mentioned in the report that Pakistan is well prepared for a possible war with India, as Islamabad has even more nuclear warheads than New Delhi. While India has 118 warheads, Pakistan has 130 and China has 180. Interestingly, Pakistan's longest range missile 'Shaheen-3' has a limited

range of 2,750km that is good enough to hit important Indian targets. Meanwhile, Thielmann and Logan expressed serious concern over the nature of arms race in Asia, saying: "While Pakistan's nuclear arsenal is designed to counter India's conventional and nuclear forces, New Delhi measures its own nuclear weapons programme against that of China. Beijing, in turn, judges the adequacy of its nuclear arsenal against

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the threat it perceives from the US' strategic offensive and defensive capabilities. And in its efforts to mitigate the ballistic missile threat from North Korea, the US and its allies in the region are expanding their strategic and theatre missile defence capabilities."

At the same time, they opined that if China tries to improve its arsenal in relation to the US and develop 'full spectrum' deterrence, then it will have an effect on India and Pakistan. Thielmann and Logan tried to explain the nature of modern arms race from a different angle, although they admitted that it would be difficult to get a complete picture from the number of warheads possessed by three-four countries. For example, China has around 25 DF-31A ballistic missiles with a range of 11,000+km that can easily hit targets in the US. On the other hand, India has an undisclosed number of 'Agni-5' missiles with a 5,200km range that can hit significant Chinese targets.

Analysing the nature of nuclear rivalry in Asia, the two authors said that the "technical realities and doctrinal inclinations" would keep India an "inherently second strike system" against China and Pakistan. "Moreover, tight control over India's operational nuclear force by civilians and the oversized role of the DRDO over new nuclear weapons development imply that military necessity is unlikely to be the principal driver of nuclear weapons policy," they stressed.

As per the report, India plans to sign the 'Hague Code of Conduct against Ballistic Missile Proliferation' in order to become a member of the NSG. Thielmann and Logan have welcomed India's decision, saying that both India and Pakistan should join the CTBT and convert their unilateral moratoria on nuclear testing into a legally binding agreement.

Source: <http://inserbia.info/>, 18 August 2016.

SOUTH KOREA

Former Saenuri Whip Says South Korea Needs Nukes

With North Korea continuing to hone its nuclear and missile capability, possibly to push ahead a fifth nuclear test, South Korea should have its own nuclear weapon for self-defense, the ruling Saenuri Party's former floor leader told *The Korea Herald*. Rep. Yoo-chul urged the government to shift away from observing a decades-old non-nuclear policy toward embracing nuclear armament for self-defense, proposing to use the North's potential nuclear test as a "trigger" to begin the armament process. "The trigger strategy means that we should get into a process equivalent to nuclear armament right after North Korea carries out yet another nuclear test" he said. "The most efficient ways to deter nuclear warfare is to have nukes for our self-defense."

Some warned that if Seoul becomes a nuclear state, it would not only bring about economic sanctions from the international community but also lose moral ground to rebuke Pyongyang's nuclear ambition.

Nuclear armament, according to the lawmaker, includes all the measures varying from the development of nukes to the planned redeployment

of US tactical nuclear weapons, of which the best option should be selected to fit South Korea's security landscape. To rally support behind his proposal, the former chairman of the parliamentary National Defense Committee built a study group for nuclear armament in July and has gathered opinions from like-minded lawmakers and security experts. His proposal has prompted intense debates over whether the measure will indeed be conducive to South Korea's security and economy. Some warned that if Seoul becomes a nuclear state, it would not only bring about economic sanctions from the international community but also lose moral ground to rebuke Pyongyang's nuclear ambition.

But the fifth-term lawmaker dismissed the view as "short-sighted." He asserted that the nuclear possession status could help maintain balance of power between the two Koreas and that the security benefit will far outweigh the potential

setback in domestic economy and overseas reputation. "Over the past decades, we have tried to solve North Korea's nuclear issues through six-party talks but the approach has made little progress. It is time for us to come up with new strategy that reaches beyond conventional paradigm," he said. Won is not the first Korean politician advocating nuclear armament. Ranging from the former president Chung-hee to former presidential candidates Mong-joon, groups of prominent politicians have backed the agenda.

But these efforts were often dismissed as unrealistic ideas or mere political stunts, as South Korea is prohibited by international law from developing nukes. The nation became a signatory to the NPT in 1979 and its nuclear system is subject to inspection from IAEA. It is the suggestion of the Saenuri lawmaker that the government should withdraw from those pledges because South Korea confronts "destructive and terrorizing" threats from North Korea. Under Article 10 of the NPT, member states can leave the treaty when "extraordinary events jeopardizes national interest." "North Korea's continuing efforts to improve its nuclear weapons, making them smaller and lighter, increasingly expose us to the consequent dangers," he said.

...One of the major hurdles facing Won is the strong opposition from Korea's long-time ally –the US. The US President Obama set out his vision for a "nuclear-free world" back in 2009 and made the initiative one of the main goals during his tenure. The latest opposition came from Einhorn, former

special adviser to the US Secretary of State for nonproliferation and arms control. During the meeting with Won in April, he warned that the decision to obtain nukes would come with a "serious price to pay." But the lawmaker expected that the US would change its course as North Korea continues to ratchet up its nuclear threat against Seoul and Washington, using the provocations like the launch of Musudan intermediate-range ballistic missile targeting the US continent.

...Citing the nuclear armament of the NATO states such as the UK and France, which the US has endorsed, he claimed that Washington should also be convinced to understand South Korea's armament for the sake of regional stability. A number of local experts deterred Won's idea, claiming that instead of a full-fledged approach that may trigger backlashes from the international community, Seoul should adopt a "conditional armament," depending on Pyongyang's denuclearization efforts. They also suggested that the strategy should be used as leverage against the US and China, pushing Beijing to become more involved in curbing Pyongyang's nuclear plans and Washington to reinforce its nuclear umbrella.

But in Won's opinion, this blueprint has its flaws in assuring national security, as the US-led nuclear umbrella is not guaranteed to take effect at all times.... "The US nuclear umbrella, which we see as protection, can be folded back anytime, and we just cannot borrow the umbrella whenever it rains." The lawmaker stressed that the nuclear armament will not

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conflict with Korea-US alliance and that the bilateral relationship would undergo little change regardless of who is elected as the next US president – including Republican nominee Donald Trump, who calls for withdrawal of US forces stationed in Korea. But he pointed out that the bilateral relationship should transform into a “matured partnership,” in which South Korea can reduce its overreliance on the US for security matters and exercise more authority in taking self-defense measures....

Source: <http://www.koreaherald.com/>, 21 August 2016.

The system was designed to intercept cruise missiles, drones, combat aircraft and ballistic missiles, according to earlier statements by Dehghan. The project was launched as an alternative to the Russian S-300 system, the delivery of which was suspended in 2010 due to sanctions imposed over Iran’s nuclear programme.

2015. “If we world powers around the negotiating table, it is because of our national strength, because of our national unity,” he said.

Rouhani also unveiled the first Iranian-made turbo-jet engine, saying it was capable of flight at 50,000 feet. “The Islamic republic is one of eight countries in the world who have mastered the technology to build these engines,” the president said. Dehghan added that Iran was now looking to develop seaborne cruise missiles capable of supersonic speed. In 2015, shortly before the conclusion of an international agreement on Iran’s nuclear programme, Moscow re-authorised the delivery of the S-300 system in a move criticised by the US and Israel. Iran’s army said in May that it was now equipped with the S-300 system, though further parts are due over the coming months. The new Bavar 373 has Iran’s first vertical launcher, using Sayad 3 missiles that were first tested in September 2014.

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Source: <http://www.dailymail.co.uk/>, 21 August 2016.

BALLISTIC MISSILE DEFENCE

IRAN

Iran Releases Images of New Missile Defence System

Iran released images of its first domestically built long-range missile defence system on 21 August 2016, a project started when the country was under international sanctions. Images on multiple state news agencies showed President Rouhani and MoD Dehghan standing in front of the new Bavar 373 missile defence system. The system was designed to intercept cruise missiles, drones, combat aircraft and ballistic missiles, according to earlier statements by Dehghan. The project was launched as an alternative to the Russian S-300 system, the delivery of which was suspended in 2010 due to sanctions imposed over Iran’s nuclear programme.

“We did not intend to make an Iranian version of the S-300 – we wanted to build an Iranian system, and we built it,” Dehghan told the IRNA news

RUSSIA

Russia Says Fires Iskander-M Ballistic Missile during Training Exercise

The Russian Defence Ministry said 19 August 2016 it had successfully fired a ballistic missile from an advanced Iskander-M mobile launch system as part of a training exercise in the country’s Far East. “The

missile successfully hit its targets in one of the polygons in the Amur Region, travelling about 300 kilometres (186 miles)," the ministry said in a statement on social media. "Thanks to a direct hit, several facilities were destroyed, including a simulated enemy's command post." The Iskander, a mobile ballistic missile system codenamed SS-26 Stone by NATO, replaced the Soviet Scud missile. Its two guided missiles have a range of up to 500 kilometres (about 300 miles) and can carry either conventional or nuclear warheads. The Amur Region is located in Russia's Far East, in eastern Siberia.

Source: <http://www.ndtv.com/>, 19 August 2016.

SOUTH KOREA–JAPAN–USA

Predator B UAS in Missile Tracking Test

General Atomics Aeronautical Systems (GA-ASI) has carried out a missile tracking test using the Predator B UAS under a contract with the Missile Defense Agency (MDA), the company announced on 15 August. The test was executed as a part of the Pacific Dragon exercise – a trilateral BMD tracking event between the South Korean navy, Japan Maritime Self Defense Force and the US Navy – conducted off the coast of the Pacific Missile Range Facility in Kauai, Hawaii, in June.

The exercise aims to improve tactical and technical coordination among its participants, including the reporting, tracking and detection of ballistic targets. Two Predator B/MQ-9 Reaper UAS equipped with the Raytheon Multi-spectral Targeting System-B electro-optical infrared turrets were used to detect and track a ballistic missile target as part of an ongoing programme with MDA. The Predator B also took part in exercises with US Navy vessels. Blue, CEO, GA-ASI, said: 'The test provided valuable data in our ongoing effort to develop an effective airborne missile defence capability.'

Source: [/www.shephardmedia.com](http://www.shephardmedia.com), 18 August 2016.

USA

US Lobbies China Again on Missile Defence System

A decision by the US and South Korea to deploy an advanced anti-missile defence system is aimed at defending against North Korea's missile threat and does not threaten China, a senior US officer said in Beijing on 16 August 2016. The US has repeatedly tried to rebuff anger from China about Seoul's move to host a THAAD unit with the US military. Milley, Chief of Staff of the US Army, told his People's Liberation Army counterpart Zuocheng that THAAD was a defensive measure, the US Army said in a statement released by the US Embassy in Beijing. THAAD "is a defensive measure to protect South

Koreans and Americans from the North Korean ballistic missile threat and is not a threat in any way to China", the statement paraphrased Milley as saying.

South Korea has said, too, that the move is purely to counter growing missile threats from the North and was not intended to target China, but Beijing has protested it would destabilise the regional

security balance. North Korea conducted its fourth nuclear test in January and followed up with a satellite launch and a string of test launches of missiles in violation of UNSC resolutions. China and the US have been at odds over the disputed South China Sea as well. Beijing has been upset with US freedom of navigation patrols in the waters there, and the US has expressed concern about Chinese aircraft and ships operating in a dangerous manner close to US forces. Milley said the US wants to maintain open channels of communications with China's military to "reduce the risk of crisis or

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miscalculation and candidly address differences”, the statement said.

Milley “reaffirmed the US commitment to adhere to international rules and standards and encouraged the Chinese to do the same as a way to reduce regional tensions”. China claims most of the South China Sea, through which more than \$5 trillion of trade moves annually. Brunei, Malaysia, the Philippines, Taiwan and Vietnam have rival claims. China’s Defence Ministry quoted Li as saying that THAAD, the South China Sea and Taiwan were all issues Beijing hoped Washington would pay attention to and “handle appropriately”. China “hopes both militaries can increase cooperation, appropriately handle disputes and manage and control risks”, the statement paraphrased Li as saying.

Source: <http://www.financialexpress.com/>, 17 August 2016.

NUCLEAR ENERGY

CANADA

BWX Technologies Subsidiary to Acquire Canadian Company

Lynchburg-based-BWX Technologies Inc. has announced that its subsidiary BWXT Canada Ltd. (BWXT Canada) has entered an agreement to acquire GE Hitachi Nuclear Energy Canada Inc. (GEH-C). The terms of the transaction are not being disclosed. GEH-C is a major supplier of fuel, fuel-handling systems, delivery systems and replacement components for CANDU reactors, Canadian-developed, pressurized heavy water reactors used for generating electric power. GEH-C employs about 350 employees and operates three sites in Ontario, including Peterborough, Toronto and Arnprior. The deal is expected to be completed, subject to required Canadian regulatory reviews and other closing conditions, during the fourth quarter of 2016.

BWXT said the acquisition would double its footprint in Canada and signal a long-term strategic commitment to the CANDU nuclear power segment. Following the completion of the deal, GEH-C would maintain its headquarters in Peterborough and its activities would be operated as part of BWXT Canada’s overall commercial nuclear business. John MacQuarrie, BWXT Canada’s president, will lead the combined organization and Mark Ward, GEH-C’s current president, is expected to remain a member of the leadership team.

Source: <http://www.virginiabusiness.com/>, 19 August 2016.

CHINA

China Plans to Make Nuclear Energy Tech a Major Export

On a seaside field south of Shanghai, workers are constructing a nuclear reactor that is the flagship for Beijing’s ambition to compete with the United

States, France and Russia as an exporter of nuclear power technology.

The Hualong One, developed by two state-owned companies, is one multibillion-dollar facet of the Communist Party’s aspirations to transform China into a creator of profitable technology from mobile phones to genetics.

Still, experts say Beijing underestimates how tough it will be for its novice nuclear exporters to sell abroad. They face political hurdles, safety concerns and uncertain global demand following Japan’s Fukushima disaster.

China’s government-run nuclear industry is based on foreign technology but has spent two decades developing its own with help from Westinghouse Electric Co., France’s Areva and EDF and other partners. A separate export initiative is based on an alliance between Westinghouse and a state-owned reactor developer.

The industry is growing fast, with 32 reactors in operation, 22 being built and more planned, according to the World Nuclear Association, an

The industry is growing fast, with 32 reactors in operation, 22 being built and more planned, according to the World Nuclear Association, an industry group. China accounted for eight of 10 reactors that started operation last year and six of eight construction starts. Abroad, builders broke ground in Pakistan last year for a power plant using a Hualong One, supported by a \$6.5 billion Chinese loan. Also last year, Argentina signed a contract to use the reactor in a \$15 billion plant financed by Chinese banks.

industry group. China accounted for eight of 10 reactors that started operation last year and six of eight construction starts. Abroad, builders broke ground in Pakistan last year for a power plant using a Hualong One, supported by a \$6.5 billion Chinese loan. Also last year, Argentina signed a contract to use the reactor in a \$15 billion plant financed by Chinese banks.

Sales come with financing from state banks, a model that helped Chinese companies break into the market for building highways and other public works in Africa and the Middle East. State-owned companies also are lining up to invest in nuclear power plants in Britain and Romania. "This is generating significant build-up of skills and industrial experience," said Mycle Schneider, a nuclear energy consultant in Paris, in an email.

... At home, Beijing faces public unease about nuclear power following an avalanche of industrial accidents and product safety scandals. In August, thousands of residents of Lianyungang, north of Shanghai, protested after rumors spread that a facility to process nuclear waste might be built there. Authorities said the city, home to one of China's biggest nuclear power plants, was only one of several being considered. After more protests, they announced the search for a site was suspended. Overseas, China's nuclear companies face questions over their status as arms of the state.

British Prime Minister Theresa May ordered a security review of plans to allow China General Nuclear Power Corp. to become a minority investor in the planned Hinkley Point C power station being built by EDF. In response, China's ambassador to London wrote in The Financial Times newspaper that a delay might harm official ties.

The Hualong One under construction in Fuqing, near the southeastern city of Fuzhou, is a hybrid created by CGN and its main rival, China National Nuclear Corp., after they were ordered in 2011 to merge two competing reactors into a single export

product.

Based on French systems of the 1970s and '80s, it belongs to the industry's third generation of reactors, with more advanced safety features and working life of 60 years instead of the previous generation's 40. CNNC is installing two Hualong One reactors at the Fuqing Nuclear Power Plant, due to go online in 2019 and 2020. The power station also has two Areva units and is building two more.

CGN is building its own version in Fangchenggang on the southern coast near Vietnam and says it

wants to seek British regulatory approval of the Hualong One design for possible use in a power plant in Bradwell on Britain's east coast.

China's nuclear industry has yet to report a major accident but reflexive

official secrecy makes it hard for outsiders to assess its safety. Changes in Chinese-designed models based on foreign technology, such as making reactors bigger while using cooling techniques for smaller units, "raise questions about safety and the good judgment of Chinese reactor engineers," said Edward Lyman, a nuclear power specialist for the Union of Concerned Scientists in Washington, in an email. "It is crucial for countries importing Chinese nuclear technology to rigorously conduct their own oversight over the products they are buying," Lyman said.

... So last year, Beijing declared nuclear power one of 16 "national science and technology projects," with generous financial support to develop homegrown know-how. The ruling party's latest five-year development plan calls for China to have 58 gigawatts of nuclear generating capacity by 2020 and another 30 gigawatts under construction. By 2030, it wants 120 to 150 gigawatts of nuclear capacity supplying 8 to 10 percent of China's power.

China's status as an important market for global suppliers gives Beijing leverage in acquiring

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technology. Westinghouse, which was acquired by Japan's Toshiba Corp. in 2006, Areva and France's EDF have had partnerships with Chinese researchers since the early 1990s. ... Other global suppliers include GE Hitachi Nuclear Energy, South Korea's KEPCO, Canada's Candu Energy Inc. and Russia's Atomstroyexport. Westinghouse transferred technology for its latest reactor, the AP1000, to China's State Nuclear Power Technology Corp. in 2007 as part of a transaction that included the sale of four reactors.

The AP1000 became the basis for future Chinese reactor development and Westinghouse agreed to sell reactors with SNPTC. The Chinese partner, which merged with another state company to form the State Power Investment Corp. last year, also developed its own, bigger version, the CAP1400. The two companies are in talks with Turkey about selling four reactors based on the AP1000. The AP1000 has been approved by US and British regulators, Benjamin said, while the CAP1400 is just beginning the review process. "We look forward to participating in the China market for many years to come," he said. Abroad, "there will be markets either SPIC on their own or Westinghouse on our own might not have access to, but together we can gain access."

Source: Article by Joe McDonald, <http://www.elp.com/articles/2016/08/china-plans-to-make-nuclear-energy-tech-a-major-export.html>, 25 August 2016.

INDIA

Negotiations with China on NSG Soon

As the NSG discusses how to deal with the cases of NPT signatory States in the context of India's application, New Delhi is preparing to engage with China to remove the stumbling blocks. China tried to block discussions on India's application for NSG membership this June on the technical grounds that New Delhi is not a signatory to the NPT. Later China claimed that it was not opposed to India's membership but during the NSG plenary session in Seoul signing NPT was an issue for some members too. It is learnt that countries like Brazil and Turkey called for a criteria-based process to be put in place first to avoid any confusion in future.

Indian Government is hoping the Chinese position may evolve with engagement as India prepares to discuss technicalities of its application for the NSG. Top Government sources said talks with Chinese lead negotiator and Director-General of the Arms Control division Wang Qun with his Indian counterpart Gill may open scope for agreement on stumbling points like the clause of signing NPT where China has an issue. There are broadly five factors taken into account for considering NSG membership application and adherence to NPT is only one among them. The other points include adherence to an equivalent international nuclear non-proliferation agreement and full compliance with

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There are broadly five factors taken into account for considering NSG membership application and adherence to NPT is only one among them. The other points include adherence to an equivalent international nuclear non-proliferation agreement and full compliance with the obligations of such agreement, enforcement of a legally based domestic export control system and, support of international efforts towards non-proliferation of weapons of mass destruction and of their delivery vehicles.

the obligations of such agreement, enforcement of a legally based domestic export control system and, support of international efforts towards non-proliferation of weapons of mass destruction and of their delivery vehicles.

India with a 2008 waiver, and a strong supporter of international efforts in checking non-proliferation of nuclear weapons feels it has a strong case. It has asked member countries to judge its application on the basis of credentials, track record and that the question of procedures and criterion was already addressed when India was granted waiver in 2008. "Three countries became NSG members before signing NPT. The NSG membership rules itself say signing of NPT or equivalent agreement as a point. If NPT was the only clause then the option of other agreements and efforts would not have been mentioned," said the source.

Indian hopes also arise from the indication by the Chinese side that there is scope for dialogue on this. The Chinese indicated they are ready for negotiations and finding a solution. Besides, India today is also better positioned with MTCR membership in hand. The NSG during its last plenary session in Seoul this June had discussions on the issue of "Technical, Legal and Political Aspects of the Participation of non-NPT States in the NSG" and decided to continue its discussion.

...

Source: <http://www.dailypioneer.com/>, 22 August 2016.

Second Nuclear Power Unit at Kudankulam Connected to Grid

The second 1,000 MW unit of the KNPP in Tamil Nadu was connected to the grid, said a senior official. "The second unit of KNPP was connected to the grid at 11.17 a.m. The unit is operating at 170 MW," R.S. Sundar, the site director at KNPP, told IANS over telephone from Kudankulam.

... The tariff for the power generated from the first unit is around Rs 3.90 per unit, Sharma said. Meanwhile, the second unit will be operated for three or four days and then will be disconnected from the grid for testing the parameters. ... "In three

months time we expect the unit to start power generation to its full capacity," he added. "We will touch power generation of 280 MW by the end of the day. We will operate the plant at that level for four days and then disconnect the unit from the grid," H.N. Sahu, station director, told IANS over phone. He said the unit had AERB permission to operate up to 50 per cent capacity.

"On restarting the unit later, the power levels will be increased to 50 per cent. After that we have to get AERB's permission for increasing the power levels. In a couple of months, we hope to touch 100 per cent power levels," Sahu added. The second unit went critical or started nuclear fission on July 10. According to Sundar, the unit was operating at low power after it went critical. ...

Source: *The Economic Times*, 29 August 2016.

IRAN

Iran to Start Construction on Two More Nuclear Plants

Iran said that it will soon start construction on two nuclear plants in the country, as part of a deal with Russia announced two years ago called Bushehr Phase II. The two additional plants are also set to be built in the port city of Bushehr in southern Iran in addition to the one that is already operational. ...

The spokesman for the Atomic Energy Organization of Iran (AEOI) said that "in the coming weeks, we will try to hold the final talks and then soon after announce a date for starting the construction of the power plants," according to the semi-official ISNA news agency. Kamalvandi said the funds, an investment of some \$10 billion, have been earmarked on the orders of Iranian President Hassan Rouhani.

Two weeks ago, Iranian MP Seyed Hossein Naqavi Hosseini said Iran in cooperation with Russia had "a good experience of building [the] Bushehr nuclear power plant," adding that the design for the new plants had been completed by the AEOI. In 2014, Tehran signed a contract with Moscow to build the two reactors at the existing Bushehr power plant. Construction was supposed to

commence a year later but had been delayed. The agreement involves the construction of eight reactors in all. ...

Source: <http://www.timesofisrael.com>, 29 August 2016.

JORDAN

Jordan Seeking Funds for First Nuclear Power Plant

Jordan's first nuclear power plant could be operational by 2025, if sufficient financing is secured, the Jordan Atomic Energy Commission (JAEC) said on 18 August. "Jordan is currently in talks with German, Czech, Chinese and Japanese companies among others to supply turbines and electrical systems for the power plant and things are going well," said JAEC Chairman Toukan. Thirty per cent of the \$10 billion project will be financed equally by Jordan and Russia, who are partners in the project. JAEC is engaged in discussions with companies to secure the remaining 70 per cent to pay for turbines and electrical systems, Toukan said. "If we secure finance by the end of 2017, we will be able to operate the first reactor by 2025," he noted.

Under an agreement with Russia, Jordan plans to build a power plant with two nuclear reactors, each with a capacity of 1,000 megawatts... The IAG was formed in November 2015 to provide consultations on the strategy to deal with nuclear waste, and the best options and mechanisms to finance the plant.

The IAG indicated that Jordan should consider hiring full-time international experts in the early stages of the programme in key disciplines to provide oversight of critical areas as well as to mentor newly trained Jordanian graduates. In addition, expert Jordanian staff must be available to enable Jordan to be an intelligent customer through the nuclear energy development programme, including providing smart oversight of products from consultants

Under an agreement with Russia, Jordan plans to build a power plant with two nuclear reactors, each with a capacity of 1,000 megawatts... The IAG was formed in November 2015 to provide consultations on the strategy to deal with nuclear waste, and the best options and mechanisms to finance the plant. The group includes former energy minister Shraideh and seven international industry experts. The head of the IAG, Bakhit, said Jordan was moving ahead with the project in a transparent way, while following the highest international standards.

Bakhit said the IAG report was sent to the government and all the concerned authorities to address the group's recommendations. ... The IAG indicated that Jordan should consider hiring full-time international experts in the early stages of the programme in key disciplines to provide oversight of critical areas as well as to mentor newly trained Jordanian graduates. In addition, expert Jordanian staff must be available to enable Jordan to be an intelligent customer through the

nuclear energy development programme, including providing smart oversight of products from consultants, the report said.

On waste, the IAG said while the country's "strategy for radioactive waste management is considered to be appropriate", more should be done to firm up the scope and funding. The proposals for a "near-surface repository for low and intermediate waste should be developed further, brought forward and include the specification for the on-site reactor waste processing and packaging", the IAG said. Toukan said the Jordan Research and Training Reactor will be launched in November. ... The IAG commended Jordan for its responsible and balanced approach to its peaceful nuclear power programme.

Source: <http://www.jordantimes.com/>, 20 August 2016.

RUSSIA

Russian Nuclear Corporation Issues Unlikely Decree for Reactor Construction Near Murmansk

A Russian government decree published on the first of the month indicates the country plans to construct 11 new nuclear power reactors by 2030

– including two BN-1200 sodium-cooled fast neutron reactors. The decree, which covers “territorial planning for energy” for the period, also identifies six points for radioactive waste disposal. The 11 units do not include those already under construction – Kaliningrad, Leningrad, Novovoronezh and Rostov – or the floating reactor *Academician Lomonosov*. The BN-1200 reactors are to be built at the Beloyarsk and South Urals nuclear power plants, World Nuclear News reported.

But it does include the construction of a, which would be the first in line for the Kola Nuclear Power Plant II, namely an experimental reactor called the VVER-600 unit. Construction of the Kola NPP II has been a source of controversy. The oldest reactors at the first plant have been granted engineering life spans until 2033 and 2024 respectively, leaving environmentalists and nuclear observers scratching their heads over the new diktat from Rosatom. Nikitin Chairman the Environmental Rights Center Bellona said in an interview that it’s nearly impossible to keep up with the plans Rosatom issues, and that the notion of building a plethora of new reactors in the next 14 years is a wishful thinking at best.

He also cautioned that the “territorial planning for energy” doesn’t commit Russia to building any of the ambitions plans it holds. “This is, so to speak, an obligatory document, but is not sufficient for the construction of what it enumerates,” he wrote. “Therefore, weather the KNPP-2 will be built or when remains unknown.” He added that he’s been told by numerous Rosatom officials that a number of radioactive waste storage sites had been planned for construction by 2014, and that hasn’t come to be. “So the planned nuclear power stations could meet with the same situation,” he wrote. Zolotkov, a nuclear expert with Bellona in Murmansk suggested that building a new plant under the newly issued

“territorial planning for energy” could be logical.

He said in an interview that Rosatom suggests retiring before 2030 a capacity of some 880 megawatts power, but noted Rosatom proposes replacing it with only 600 megawatts of power. “Here we have to remember that for several years, the locality hasn’t demanded up to 500 megawatts from the Kola Nuclear Power Plant, therefore the exchange [of reactor power] would be logical,” he wrote. Because of that deficit, it wouldn’t make sense to ask for Rosatom build it’s bigger run reactors that produce 1000 to 1200 megawatts

of power, mainly because the energy infrastructure in the area can’t handle conducting that much power. “For that, one would need to redo the whole infrastructure – power lines, substations, etc.,” he wrote. He pointed out a similar situation in 2013 arose in a previous “territorial planning for energy.” That plan called for the installation of VVER 1200 reactors at the Kola

Nuclear Power Plant II.”

That plan likewise was not realized.... “The former ‘plans’ [also] include two wind energy parks for Murmansk of 300 and 100 megawatts each of which are to be built by 2020 and 2025.” The decree also approves building a facility to produce high-density U-Pu nitride fuel and the construction by 2025 of the BREST-OD-300 fast neutron reactor, WNN reported. BREST-OD-300 is part of Russian state nuclear corporation’s ‘Proryv’, or Breakthrough, project to enable a closed nuclear fuel cycle. The ultimate aim is to eliminate production of radioactive waste from nuclear power generation... In addition, the decree said a total of seven VVER-TOI units at the sites of Kola II, Smolensk II, Nizhny Novgorod, Kostroma plants and the planned Tatar nuclear power plant, said WNN.

Source: <http://bellona.org/>, 21 August 2016.

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NUCLEAR COOPERATION

INDIA-AUSTRALIA

India Yet to Start Commercial Import of Uranium from Australia

India gave a commitment to Paris climatic conference to reduce carbon emission drastically; hence its planned mega shift from fuel based energy to clean nuclear energy. Accordingly the nuclear power generation capacity of the country which currently stands at 5780MW needs to be raised to 63000 MW by 2032 i.e. almost 11 times in 16 years. The Indo-

Australian civil nuclear agreement and the follow up actions have to be viewed in this context. Modi's visit to Australia and his meeting with Talbot queered the pitch for the Indo-Australia civil nuclear agreement in 2015. India also finalised administrative arrangements with Australia for import of uranium. All these initiatives were to be followed by commercial contract to initiate supply.

Unfortunately such contract has not yet been signed. As the third largest producer of uranium with close to 40% of world's uranium reserves Australia provides almost an inexhaustible source of nuclear fuel. South Australia alone accounts for 81% of the country's reserves which translates to 32% of world's uranium reserves. Currently

public debate has raged in South Australia on its involvement in nuclear fuel cycle. The development is of fundamental importance to India. The Kaleidoscopic change and the promptly evolving situation is certainly a cause for worry. In the meanwhile India has strengthened supply from Russia, Canada and Kazakhstan. During the year

2015-16, India secured 345 tonnes of uranium from Russia and 250 tonnes from Canada.

The year before, import from Kazakhstan amounted to 283 tonnes. India has courted African country

Mozambique as another probable source of supply of this precious yellow cake. Since India is in the throes of a highly ambitious nuclear energy programme, it needs to keep all its suppliers lined up rather than turning the back to Australia. Uranium is crucial to India's civil nuclear power programme. Despite the agreement there has been no supply yet from Australia because

of the absence of any commercial contract between India and the privately held uranium exporting companies in Australia. South Australia had set up a royal commission on nuclear fuel cycle which submitted its report in May, 2016. The state has now gone public with the report seeking community consultations in an effort to seek people's opinion. It is stated that even if the outcomes of these consultations turn out to be

negative, it will have no impact on sale of Uranium to India. South Australian minister Smith stated that the state was open to investments by Indian companies into nuclear waste repository which the state is likely to build.

This was one of the major recommendations of the royal commission report

that sought to establish used nuclear fuel and intermediate level waste storage and disposal facilities. "The nuclear waste repository will entail investments worth billions of dollars and Indian companies can also get involved. This is not related to supply of uranium to India but it can certainly add value to India's cooperation with

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The year before, import from Kazakhstan amounted to 283 tonnes. India has courted African country Mozambique as another probable source of supply of this precious yellow cake. Since India is in the throes of a highly ambitious nuclear energy programme, it needs to keep all its suppliers lined up rather than turning the back to Australia.

Australia (in civil nuclear technology)," said Smith. ... The reluctance from India could be due to lack of companies in private sector with such expertise. But it could be the right time to start capacity building among Indian private sector companies to transport nuclear material and develop expertise in nuclear waste depository's constructions.

Source: <http://www.newdelhitimes.com/>, 22 August 2016.

INDIA-RUSSIA

Putin: Russia to Develop Indian Nuke Power Industry

Russian President Putin has announced that Moscow will soon sign an agreement with New Delhi to construct the third stage of India's KNPP. Speaking at a media conference in the Russian capital, President Putin recently said: "We have big plans with our Indian friends in the area of nuclear energy. Construction work on the third and fourth blocks of the Indian nuclear power plant started in February. We expect to sign a general framework agreement and a credit line for the construction of a third stage by the end of this year." He met the press after the handover of the plant's first power unit to India. Earlier, President Putin and Indian PM Modi dedicated the first unit of the power plant to the South Asian nation via video-conferencing.

The power station, situated in the southern Indian province of Tamil Nadu, is being built by Rosatom nuclear corporation of Russia on the basis of a deal signed between Moscow and New Delhi in 1998. Putin thanked Rosatom officials for building the plant, saying that the first and second reactors of the KNPP would enhance India's energy supply and also strengthen its economic position. For his part, PM Modi said that it was not possible for India to build the plant without Russia's help, as 80% of the project's financing was covered by a Russian loan.

Revealing that India plans to build a number of 1,000-megawatt nuclear power plants jointly with Russia, the premier stressed: "I have always deeply valued our friendship with Russia and it is fitting that we jointly dedicate the first unit of KNPP." Modi added: "In the years ahead, we are determined to pursue an ambitious agenda of nuclear power generation. At Kudankulam alone, five more reactors of 1,000-megawatt each are planned. In terms of our co-operation with Russia,

we plan to build a series of bigger nuclear power plants." Currently, Russia is the only country that is co-operating with India on nuclear energy. The first reactor at the Kudankulam plant is one of the most powerful reactors in India and it meets the latest safety requirements. The second generator will start

operating in the coming months.

Source: <http://inserbia.info/>, 20 August 2016.

NUCLEAR DISARMAMENT

GENERAL

Australia Attempts to Derail UN Plan to Ban Nuclear Weapons

Australia has attempted to derail a ban on nuclear weapons at a UN meeting on disarmament, by single-handedly forcing a vote on a report that had been expected to pass unanimously. The report, which recommended negotiations begin in 2017 to ban nuclear weapons, was eventually passed by 68 votes to 22. An Austrian-led push for the treaty had reached a milestone on 19 August, when the report was presented to representatives of 103 nations in Geneva. Moves towards a ban have been pursued because many saw little progress under the existing NPT, which obliges the five declared nuclear states to "pursue negotiations in good faith" towards "cessation of the nuclear arms race ... and nuclear disarmament".

The proposal recommended a conference be held

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in 2017 to negotiate “a legally binding instrument to prohibit nuclear weapons, leading towards their total elimination”. The text was carefully negotiated, and compromise was attempted on contentious paragraphs. Anti-nuclear campaigners involved in the process expected the report would pass without objection. But Australia surprised observers by objecting and forcing a vote. The vote was accepted by an overwhelming majority, with 68 voting in favour, 22 against and 13 abstaining. The next step will be for the proposal for negotiations to begin in 2017 will be tabled at the UNGA, after which it is likely formal negotiations will begin.

In an opening statement the Australian diplomat McConville told the meeting: “A simple Ban Treaty would not facilitate the reduction in one nuclear weapon. It might even harden the resolve of those possessing nuclear weapons not to reduce their arsenals.” The Department of Foreign Affairs and Trade said on its website that it opposed a ban on nuclear weapons because although it “might seem to be a straightforward and emotionally appealing way to de-legitimise and eradicate nuclear weapons,” it would actually “divert attention from the sustained, practical steps needed for effective disarmament”. But in 2015, documents obtained under Freedom of Information revealed Australia opposed the ban on nuclear weapons, since it believed it relied on US nuclear weapons as a deterrent. “As long as the threat of nuclear attack or coercion exists, and countries like the DPRK [North Korea] seek these weapons and threaten others, Australia and many other countries will continue to rely on US extended nuclear deterrence,” said one of the briefing notes for government ministers.

The documents revealed however that Australia and the US were worried about the momentum

gathering behind the Austrian-led push for a ban nuclear weapons, which diplomats said was “fast becoming a galvanising focus for those pushing the ban treaty option”. Japan’s ambassador to the UN conference on disarmament expressed disappointment that a vote was required. “We are deeply concerned that the adoption by voting will further divide the international disarmament community and undermine the momentum of nuclear disarmament for the international community as a whole,” he said.

Wright, Asia-Pacific director of the International Campaign to Abolish Nuclear Weapons (ICAN), said it was thought that Australia’s foreign minister, Bishop, instructed her diplomats to disrupt the international gathering late on 19 August afternoon by forcing a vote. While others then joined Australia to vote against the report, Australia was alone in forcing the vote to happen. “Australia is resisting the tide of history. A majority of nations believe that nuclear weapons are unacceptable and must be prohibited. And now they are ready to negotiate a ban,” Wright said.

“Australia’s attempt to derail these important disarmament talks was shameful and outrageous. It provoked strong criticism from some of our nearest neighbours in Asia and the Pacific, who believe that the world should be rid of all weapons of mass destruction,” he said.

The acceptance of the report was seen as a major milestone by anti-nuclear campaigners. “This is a significant moment in the seven--decade--long global struggle to rid the world of the worst weapons of mass destruction,” said Fihn, executive director ICAN.... “There can be no doubt that a majority of UN members intend to pursue negotiations next year on a treaty banning nuclear weapons,” said Fihn. “We expect that, based on the recommendations of the working group, the UNGA will adopt a resolution this

Anti-nuclear campaigners involved in the process expected the report would pass without objection. But Australia surprised observers by objecting and forcing a vote. The vote was accepted by an overwhelming majority, with 68 voting in favour, 22 against and 13 abstaining. The next step will be for the proposal for negotiations to begin in 2017 will be tabled at the UNGA, after which it is likely formal negotiations will begin.

autumn to establish the mandate for negotiations on a ban on nuclear weapons in 2017."

A Department of Foreign Affairs spokesman said: "Australia called for a vote on the report as it was the most effective way to register our opposition to a recommendation to start negotiations on a ban treaty. A consensus report was not possible in the circumstances. "Our efforts must be directed to strengthening the NPT and implementing what countries have already agreed to under its various review conference documents including the 2010 action plan. "Ban treaty negotiations will not reduce nuclear weapons, and have the potential to divert focus and further divide countries on disarmament. Proceeding with ban treaty negotiations without states which possess nuclear weapons will not further nuclear disarmament."

Source: www.theguardian.com, 21 August 2016.

UN Panel Seeks Push Toward Nuclear Disarmament

A majority of countries on a UN-mandated panel 20 August called on the UNGA to consider launching multilateral negotiations on nuclear disarmament, voting in a process that has been boycotted by the world's nuclear-armed

powers. Thai ambassador Thongthakdi, who chaired the Open-Ended Working Group on Nuclear Disarmament, hailed a "strong signal" but said many countries would have preferred consensus among voting members on an agreement that will have little impact unless nuclear powers are also on board. The panel voted 68 to 22, with 13 abstentions, today on a broad-ranging text that among other things recommends that the General Assembly take up efforts toward launching multilateral negotiations on nuclear disarmament at its next meeting.

Nuclear-armed powers including Russia, China and the US have rejected the process. Japan, which is sensitive about nuclear

issues after experiencing two atomic bomb strikes in World War II, abstained from the vote. Sano, Japan's ambassador to the UN's Conference on Disarmament, praised "many positive elements" to the text, such as calling for education about nuclear disarmament, but said envoys didn't devote enough time toward trying to reach consensus. "We are deeply concerned that the adoption by voting will further divide the international disarmament community and undermine the momentum of nuclear disarmament for the international community as a whole," he told the body after the vote.

Ware, who coordinates the advocacy group Parliamentarians for Nuclear Non-Proliferation and Disarmament, said the working group was split in two camps: A "hard-line" faction favoring a treaty that calls for the abolition for nuclear weapons right now, and another preferring "incremental measures." Ware called the vote a "good thing," but said the countries that support

a treaty will now face a tough task of convincing nuclear-armed nations to join the process. "If you just have a treaty adopted by non-nuclear states, the nuclear weapons states and allies could ignore it," he said, calling for pressure on nuclear-armed powers to adopt "no first use"

policies, move toward banning use, cut their arsenals and "give up the idea that you have security by threatening to blow up others." In the US, the Obama administration has been considering instituting a "no first use" policy before Obama leaves office, but has faced criticism in Congress and beyond and isn't expected to move quickly to institute it.

Source: <http://www.business-standard.com/>, 20 August 2016.

Wide Support for UN Talks on a Legal Ban-the-Bomb Tool

In what the ICAN calls "a dramatic final day", a group of non-nuclear countries have pushed

Ban treaty negotiations will not reduce nuclear weapons, and have the potential to divert focus and further divide countries on disarmament. Proceeding with ban treaty negotiations without states which possess nuclear weapons will not further nuclear disarmament.

through a proposal to initiate negotiations in 2017 to prohibit nuclear weapons of mass destruction.

The UN Open Ended Working group on nuclear disarmament (OEWG) wrapped up on August 19 the third series of sessions that have been convened since February, by adopting a recommendation to the UNGA in October to initiate negotiations on a legal instrument to prohibit nuclear weapons, leading to their elimination.

In a recorded vote on the proposal, 62 countries supported (all non-nuclear states), 27 countries opposed (mostly NATO countries plus South Korea), and 8 countries abstained (among them were Sweden, Switzerland and Japan). The Ambassador of Mexico, the country that had initiated the OEWG, called this "the most significant contribution to nuclear disarmament in two decades".

The Working Group held a total of 30 substantive meetings from February 22 to 26, May 2-4 and May 9-13 as well as on August 5, 16, 17 and 19. Several informal meetings were also held.

The recommendation is part of a more detailed report of the OEWG that will be presented to the UNGA. The report also includes a recommendation for States to undertake measures to reduce and eliminate the risk of nuclear weapons use, increase transparency about nuclear weapons and enhance awareness about the humanitarian consequences of any use of nuclear weapons. In a recorded vote on the proposal, 62 countries supported (all non-nuclear states), 27 countries opposed (mostly NATO countries plus South Korea), and 8 countries abstained (among them were Sweden, Switzerland and Japan).

The Ambassador of Mexico, the country that had initiated the OEWG, called this "the most significant contribution to nuclear disarmament in two decades". Following the adoption of the report, UNFOLD ZERO, Parliamentarians for Nuclear Non-proliferation and Disarmament and ICAN made statements at the OEWG session commending the work of the OEWG, and giving support for the

nuclear disarmament negotiations in 2017. The majority support for the ban treaty was clearly

underlined by joint statements delivered by Africa, Latin America and the Caribbean, Southeast Asia and the Pacific as well as statements from several European states. However, resistance continued to come throughout the working group from a small group of states who persisted that nuclear weapons are essential to

their national security.

Despite threatening to block a report, which contained a recommendation for a ban treaty, these governments did not have the leverage to thwart the successful outcome of the group, ICAN said. After long deliberations, it seemed that

States were going to agree to a compromised report, which reflected the views of both sides of the ban treaty issue. But, after this agreement had seemingly been secured behind closed doors, Australia made a last-second turnaround and announced that it was objecting to the draft of the report and called for a vote. In spite of the opposition from Australia and several

other pro-nuclear weapon states, the majority was able to carry the day, ICAN reported. On that basis, the working group was able to recommend the start of negotiations on a new legal instrument prohibiting nuclear weapons.

"This breakthrough is result of the new global discourse on nuclear weapons. Bringing together governments, academia and civil society, a series of three conferences have uncovered new evidence about the devastating humanitarian impact of nuclear weapons and the risks of their use, whether accidental or intentional," ICAN

noted in a statement. The momentum generated by the “humanitarian initiative” has now culminated with the international community on the verge of negotiating a nuclear weapons ban, it added. Nuclear weapons remain the only weapons of mass destruction not yet prohibited under international law, despite their inhumane and indiscriminate nature.

A ban would not only make it illegal for nations to use or possess nuclear weapons; it would also help pave the way to their complete elimination. Nations committed to reaching the goal of abolition have shown that they are ready to start negotiations in 2017. It is now up to the October meeting of the UNGA First Committee to bring forward this process by issuing a mandate to start the negotiating process, ICAN said. “To what extent the deep and growing polarization that exists between nuclear disarmament and deterrence enclaves within the broader nuclear policy community can be bridged, remains an open question,” says Jenny Nielsen, Postdoctoral Fellow at the Vienna Center for Disarmament and Non-Proliferation (VCDNP) in a blog for the European Leadership Network. “Whether the appetite exists at this time for bridging efforts – particularly with the growing momentum (formalized through the OEWG) to convene a conference in 2017 to negotiate a ban instrument on nuclear weapons – is more doubtful,” maintains Nielsen.

It would benefit states and analysts to engage in timely and constructive discussions on what viable alternative and options for maintaining strategic stability (as well as providing security assurances and insurance against uncertainties) – beyond the contested reliance on nuclear weapons – exist, adds Nielsen. “This is particularly prudent in light of emerging technologies, which may offer both challenges and alternatives to strategic stability based on nuclear deterrence. Left unbridged, the polarized views on the role and value of nuclear weapons won’t bring positive contributions towards reducing the risk of nuclear weapons use and a secure world free of nuclear weapons.”

Source: <http://www.indepthnews.net/>, 19 August 2016.

NUCLEAR PROLIFERATION

NORTH KOREA

‘N. Korea Produced More Plutonium to Make 2 to 4 Nuclear Warheads’

A US think tank says North Korea resumed reprocessing of spent fuel rods to produce up to eight kilograms of plutonium. That’s good enough for at least two additional nuclear warheads. As the North is openly spurring its nuclear weapons program, the South Korean government said the reprocessing of spent fuel rods is in violation of UNSC resolutions.

The Institute for Science and International Security (ISIS) on 22 August released its latest report, estimating that North Korea produced five-point-five to eight kilograms of plutonium. Two to four kilograms of plutonium is needed for a warhead. The report corresponds to assessments by the IAEA. Following the North’s earlier announcement about its resumption of nuclear activities, the watchdog agency said it detected signs that Pyongyang restarted operations of its Yongbyon nuclear facility in the first quarter of 2016. The US think tank maintained its estimate that the regime has a total of 13 to 21 nuclear weapons in its arsenal, but added there could be two or three more if operations of uranium enrichment facilities in areas outside of Yongbyon are taken into account. ...

Source: <http://world.kbs.co.kr/>, 23 August 2016.

North Korea Puts ‘Another Piece in Puzzle’ Towards Nuclear Capability

North Korea’s latest missile test has security analysts admitting that the military-led country is closer than ever to possessing a nuclear missile system capable of attacking another country. On 24 August, a North Korean submarine-launched missile flew about 500 km east, landing for the first time in Japan’s Air Defense Identification Zone (ADIZ). Pyongyang’s official KCNA news agency reported that regime leader Kim Jong Un supervised the test and described it as “the greatest success and victory”. ...

Source: <http://www.cnn.com>, 26 August 2016.

NUCLEAR NON-PROLIFERATION

US-ISRAEL

IRmep Lawsuit Seeks to End US-Israel Nuclear Deceptions

IRmep contends that US aid to Israel has been illegal under laws passed in the 1970's which prohibits aid to nuclear powers who have not signed the Nuclear NPT. During investigations into the illegal diversion of weapons-grade uranium from US contractor NUMEC to Israel in the mid-1970s, Senators Symington and Glenn amended the 1961 Foreign Assistance Act to ban any aid to clandestine nuclear powers that were not NPT signatories, such as Israel.

The US is finalizing a ten-year MoU which will reportedly boost aid to \$4-5 billion per year. The director of the Institute for Research: Middle Eastern Policy (IRmep) in the suit challenges the authority of the president and US federal agencies to deliver such foreign aid to Israel. Such aid violates longstanding bans on aid to non-signatories to the NPT with nuclear weapons programs. Since the bans went into effect US foreign aid to Israel is estimated to be \$234 billion.

"Israel has long had a nuclear weapons program and continually engages in activities which should trigger the cited provisions of Symington & Glenn." Among the most authoritative and complete recently released status updates about Israel's nuclear weapons program was contained in *Critical Technology Assessment in Israel and NATO Nations*, a report chartered by the US Department of Defense, prepared for the Office of the Under Secretary of Defense and presented in April of 1987. The report was publicly released through an unnecessarily arduous Freedom of Information Act lawsuit before this court on February 10, 2015. The report revealed the advanced state of Israel's program in 1987.

...The SOREQ center runs the full nuclear gamut

of activities from engineering, administration and non-destructive testing to electro-optics, pulsed power, process engineering and chemistry and nuclear research and safety. This is the technology base required for nuclear weapons design and fabrication." Israel's nuclear weapons facilities' were essentially a scaled-down version of US facilities says the report, "The capability of SOREQ to support SDIO and nuclear technologies is almost an exact parallel of the capability currently existing at our National Laboratories."

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Israel's ambitions were not limited to simple gun-type Hiroshima bombs, but the most [powerful] nuclear weapons since Israel was according to the report "developing the kind of codes which will enable them to make hydrogen bombs. That is, codes which detail fission and fusion processes on a microscopic and macroscopic level.

the report "developing the kind of codes which will enable them to make hydrogen bombs. That is, codes which detail fission and fusion processes on a microscopic and macroscopic level." Public knowledge of Israel's possession of nuclear weapons blossomed in 1986 when an Israeli

worker at Israel's Dimona nuclear weapons facility, Vanunu, smuggled out photos of underground nuclear weapons development which were published in the *London Sunday Times*.

... On 18 August, Israel's FM's director general banned all Israeli diplomats in Israel and abroad from having contact with Israeli journalists in the wake of a *Haaretz* report regarding the Arab states NOT seeking a vote regarding Israel's nuclear arms at IAEA meeting in September in Vienna.

Barak Ravid wrote for *Haaretz*: The Arab states, led by Egypt, have been advancing resolutions on Israel's nuclear facilities nearly every year since 1987. During this decade alone, a vote on such resolutions was taken in 2010, 2013, 2014 and 2015. Over the last three years Israel foiled the resolutions by recruiting more and more countries to vote against them. Israeli and Western diplomats dealing with the matter believe that

there are two reasons for the decision not to advance a resolution on Israel's nuclear weapons. The first is the fact that the Arab states have failed to gain a majority for the resolutions in recent years. "They simply understand that they'll lose and they don't want to be humiliated again," said an Israeli diplomat. The second reason, they said, is the dramatic warming of relations between Israel and Egypt, which has always been the country spearheading this issue....

Source: <http://www.countercurrents.org/>, 20 August 2016.

NUCLEAR SAFETY

CANADA

No Major Radiological Spill or Incident in Canada Since 1960s

Environmental and anti-nuclear advocates are raising concerns about impending south-bound shipments of liquid nuclear waste that could pass through south western Ontario. "In the event of a transport accident, or attack even ... this would be a disaster for communities

downwind and downstream," said Kamps, with Beyond Nuclear. The US-based group was one of seven jointly filing a lawsuit on 12 August against the US Department of Energy, arguing inadequate assessment and consultation have been done for the plan to bring 23,000 litres of highly radioactive liquid waste from Chalk River, near Ottawa, to a South Carolina processing facility.

"They're poised to start shipping next month," said Kamps, who's called the expected 100 to 150 truck shipments – over a period of years – "mobile Chernobyls on steroids." The high-level nuclear waste includes weapons-grade uranium – enriched in the US – and a series of radioactive isotopes generated via medical isotope production. Returning the uranium to the US stems from a 2012 commitment by the Government of Canada to repatriate the weapons-based material

for liability and nuclear non-proliferation reasons, according to the Canadian Nuclear Safety Commission. But it would be far safer to solidify the waste before shipment, and safer still to down blend – make the uranium no longer weapons useable – in Canada, Kamps said.

"There's really no good explanation for this, other than the Department of Energy is going to make a lot of money," he said, calling the move to ship high-level nuclear waste in liquid form unprecedented. The transaction comes with a \$60-million payout from Atomic Energy Canada Limited, for processing and management, an AECL spokesperson said. As far as why Canada isn't solidifying the waste, liquid-form shipments will allow the US to reprocess the material for use in fuel power reactors, said Pagé, in an email.

"Canada does not have the technology or facilities to undertake this reprocessing," she said. Solidification or down blending in Canada would also keep the materials here long term, she said.

A 2015 Energy Department report says "overall impacts of transporting the target residue material

were determined to be very small." All transports will meet or exceed requirements set by the US Department of Transportation and the US Nuclear Regulatory Commission, including using routes selected based on NRC-approved safe havens and emergency plans, the report says. There's been no major radiological incident or spill in Canada since the 1960s, despite numerous shipments of dangerous goods every year, according to the Canadian Nuclear Safety Commission. Special puncture and thermal-tested casks for transport, along with stringent security plans, are being used to ensure the safety of people and the environment, Pagé said. While the shortest route to the Savannah River Site processing facility runs through New York State, the Energy Department has indicated, in a document from 2013, it'll vary which border crossings it uses for security

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reasons.

That means shipments could come through Sarnia, across the Blue Water Bridge, Kamps said. "We're hoping that the Department of Energy will simply agree with us and halt the shipments for now until this lawsuit is settled," he said. If that fails, hopes are the lawsuit will compel the court system to stall the plan, he said. The department has 60 days to respond to the lawsuit....

Source: <http://www.theobserver.ca/>, 19 August 2016.

UAE

UAE-FANR Presents Nuclear Safety Report to IAEA

The Federal Authority for Nuclear Regulation, FANR, 23 August presented the UAE's third national report to the IAEA, IAEA, as part of the nation's participation in the Seventh Review Meeting of the Contracting Parties, CPs, to the Convention on Nuclear Safety, CNS, set to take place from 27th March to 7th April 2017, at IAEA headquarters in Vienna. The UAE's national report describes how the UAE has met its obligations to the convention as the state has made progress in constructing its first nuclear power plant at Barakah in the Western Region of Abu Dhabi. The report includes an update to the lessons learned from the 2011 accident at Japan's Fukushima Daiichi Nuclear Power Station and the measures taken in the UAE to prevent a similar incident. The report also describes the preparations underway to prepare for the first nuclear reactor to begin operations, currently expected in early 2017, pending FANR's regulatory review.

The report is the result of a collective effort of key national organisations including FANR, the Emirates Nuclear Energy Corporation, the National Emergency Crisis and Disasters Management Authority and other leading UAE institutions. The report is now available to all 78 CNS contracting parties, who can review it and submit written questions to the UAE, which will in turn provide replies in advance of the 7th review meeting. At that session, the contracting parties will again review each other's reports in working groups and

plenary sessions, as part of the convention's objective to create a "peer review" forum for nuclear safety.

"The 7th review meeting offers the UAE an opportunity to demonstrate its commitment to nuclear safety and the tangible progress it has achieved in building the regulatory framework, the technical systems, and the management infrastructure needed to conduct a nuclear energy programme safely and securely," said FANR Director-General, Viktorsson. ...

Source: <http://www.menafn.com/>, 23 August 2016.

NUCLEAR SECURITY

UK

Nuclear Power Police Admit to 21 Security Breaches

The police force charged with guarding UK nuclear power plants has admitted to 21 breaches of security last year, including 13 stolen or lost smart phones and identity cards. In one case a Blackberry was taken in a "domestic burglary", and in another a SIM card was "accidentally thrown in disposal chute at home address." Emails containing sensitive information, including an armoury access code and personal data, were sent in breach of security protocols.

The revelations have been condemned as a "catalogue of cock-ups", and prompted alarm from campaigners and politicians. They point out that there have recently been concerns about Chinese state companies stealing nuclear industry secrets. One of the reasons why the Prime Minister Theresa May is thought to have delayed a decision in July on a long-planned £18 billion nuclear power station at Hinkley Point in Somerset is the 33 per cent stake by the China General Nuclear Power Company. The company has been charged with nuclear espionage by the US government.

The Civil Nuclear Constabulary (CNC) is responsible for policing 11 nuclear sites across the UK. They include three in Scotland: the former fast reactor establishment at Dounreay in

Caithness and the nuclear power stations at Hunterston in North Ayrshire and Torness in East Lothian. The CNC has an annual budget of £100 million and 1,100 armed police officers with access to eight different weapons systems. Its latest annual report, published online, disclosed that there had been 21 security breaches in 2015-16, compared to 13 in 2014-15.

Five were categorised as “loss or theft of protectively marked electronic equipment, devices or paper documents from outside secured CNC premises”. A further six breaches were “unauthorised disclosure through insecure transmission of protectively marked documents”.

Ten more were said to be “low-level”. ...Eight occurred at the police headquarters at Culham in Oxfordshire, including the Blackberry that was stolen and the SIM card that was thrown away.

In October 2015 a member of headquarters staff accidentally sent an “official sensitive” email to her personal account in breach of security policy. In April 2015 six people outwith a secure network

were incorrectly given access to a sensitive document. At Dounreay police officers lost their warrant cards, used for identification and arrests, in June 2015 and January 2016. A warrant card was also mislaid by police at Hunterston in December. In May 2015 an armoury access code was internally emailed in breach of security policy at Dungeness in Kent. In October an unnamed contractor emailed police data including personal information to the wrong address outwith the secure network. ...

Source: Rob Edwards, <https://theferret.scot/nuclear-power-police-security-breaches/>, 9 August 2016.

NUCLEAR WASTE MANAGEMENT

USA

Nuclear Waste Accident 2 Years Ago May Cost More Than \$2 Billion to Clean Up

The *Los Angeles Times* is estimating that an explosion that occurred at a New Mexico nuclear waste dumping facility in 2014 could cost upwards of \$2 billion to clean up. Construction began on the Waste Isolation Pilot Plant (WIPP) in New Mexico’s Carlsbad desert in the 1980s. The site was built to handle transuranic waste from the US’ nuclear weapons program. The WIPP had been eyed to receive nuclear waste from commercial power-generating plants as well.

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According to the *LA Times*, the 2014 explosion at the WIPP was downplayed by the federal government, with the DoE putting out statements indicating that cleanup was progressing quickly. Indeed, a 2015 Recovery Plan insisted that “limited waste disposal operations” would resume in the first quarter of 2016. Instead, two years have passed since the incident without any indication that smaller nuclear waste cleanup programs around the US will be able to

deliver their waste to the New Mexico facility any time soon.

The 2014 explosion apparently occurred when engineers at the Los Alamos National Laboratory were preparing a drum of plutonium and americium waste – usually packed with kitty litter (yes, kitty litter) – and decided to “substitute an organic material for a mineral one.” ... The dump’s filtration system, which was supposed to “prevent any radioactive releases,” subsequently failed. No workers were in the shafts of the dump at the time. Workers on the surface were only exposed to low doses of radiation due to the HEPA filters in the ventilation system. Still, the dump site was set to receive another 277,000 drums of radioactive waste from around the country. The congestion is now creating a costly problem.

The federal government renewed its contract with dump operator Nuclear Waste Partnership to the tune of \$640 million extra for cleanup. That number could grow, especially as federal officials now say the contaminated ventilation system on the dump needs to be replaced – a project that will not be completed until 2021. Until then, the dump must remain open, but it cannot accept nuclear waste at the rate it had planned. The dump costs \$500 million a year to remain open, the *LA Times* reported. Meanwhile, feds also have to pay to house the nuclear waste being stored at sites around the US (in Washington state and Idaho, for example) that's supposed to be on its way to the WIPP.

While there may be cheaper solutions to the problem, the Department of Energy is under pressure to fix the New Mexico dump to make good on a US agreement with Russia to fulfill mutual reductions of plutonium. WIPP is currently the primary destination for weapons-grade nuclear waste. If it closes, a likely expensive and time-consuming disposal alternative would have to be

proposed.

... That means that WIPP cleanup, including indefinite housing costs for nuclear waste around the country that was to be shipped to WIPP, could rank among the costliest nuclear waste cleanup efforts in US history, on par with clean up after Pennsylvania's Three Mile Island disaster in 1979. Cleanup after that incident cost the federal government about \$1 billion, or \$1.7 billion adjusted for inflation. A DoE spokesperson e-mailed

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writing "The Waste Isolation Pilot Plant (WIPP) is critical to the Department of Energy's mission to cleanup waste Cold War nuclear weapons production. WIPP is the nation's only repository for the disposal of nuclear waste known as transuranic (TRU) waste, which consists of contaminated items such as clothing, tools, rags, residues, debris, soil, etc. The Department is committed to the recovery, and resumption of TRU disposal operations at WIPP when it is safe to do so."

Source: <http://arstechnica.com/>, 24 August 2016.



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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P-284

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