NUCLEAR SECURITY

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

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OPINION – Stuart Leslie, Indira Chowdhury

Homi Bhabha, Master Builder of Nuclear India

Homi Jehangir Bhabha (1909–66), one of the key architects of India's nuclear-science program, founded and directed two of the institutions that would bring India into the nuclear age: the Tata Institute of Fundamental Research (TIFR) and the Atomic Energy Establishment, Trombay, later renamed the BARC in his honor. TIFR remains a crown jewel of Indian science. Internationally renowned in theoretical physics, mathematics, computer science, radio astronomy, and molecular biology, it attracts distinguished visitors from across the globe. Because of its integral connection to India's nuclear weapons program, BARC has been more secretive and less visible, though no less important for Indian science.

The two research centers might be considered fraternal twins, sharing a common history and often research facilities and staff, but with very different missions. TIFR is open to scientists of every country and unfettered by secrecy. BARC is closed and its research is classified and focused on national security... .

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Bhabha, strongly believed that exposure to the arts brought out the best in creativity from scientists, and the aesthetics of Western art and music would be a constant reference point for him...Bhabha believed that catching up with the West would mean "establishing the centrality of science in the autobiography of the Indian nation." He expected TIFR and BARC to be Western in their orientation and international in their aspiration. Writing in 1944 to Sorab Saklatvala, chairman of the Sir Dorabji Tata Trust, he explained, "It is absolutely in the interest of India to have a vigorous school of research in fundamental physics, for such a school forms the spearhead of research not only in the less advanced branches of physics but also in problems of immediate practical application in industry.... I hope to build up in the course of time a school of physics comparable with the best anywhere."

...In line with Nehru's sense that science was

important for a modern state, the period that followed India's achieving independence in 1947 saw 11 national laboratories being built under the auspices of the Council for Scientific and Industrial Research....Bhabha had set up TIFR in 1945, with funds from the Tata Trust. The institute's original home was the Indian Institute of Science....It was not until 1954, however, that Bhabha managed, after a lot of negotiation, to acquire a suitable site for the permanent TIFR building. Inaugurating the edifice in 1962....

Academic Exclusiveness and Expertise: Scientific work at TIFR began well before the new building was ready. By the time it was completed, research at the institute had expanded. Nuclear physicist Bernard Peters worked at the institute for 10 years beginning in 1950 and guided a group that observed strange particles.... Soon after the building's inauguration in 1962, TIFR expanded to include two new fields: molecular biology and radio astronomy. Significantly, the presence of biologists in a physics institution enabled interdisciplinary engagements. Fume hoods and facilities for microbiology had to be added to what was essentially a space for physics, but Bhabha's control over budgets made those additions possible....

In recent years TIFR has made significant contributions to understanding statistical models that manifest self-organized criticality. Moreover, Bhabha had ensured support for his institute from India's Department of Atomic Energy...Western visitors often say that TIFR reminds them of MIT and other familiar campuses.

When Trombay's first recruits arrived in 1954, they had virtually no experience in reactor design. Bhabha sought advice from former British colleagues but insisted that his team do as much of the design and fabrication as possible. Aside from some specialized electronic valves, the Indian team made all of Apsara's components in the workshops at TIFR.... For Bhabha, CIRUS offered experience in building and operating a powerful reactor, a source of medical isotopes, a neutron source for experimental physics, and a source of plutonium.... As Bhabha reported to Nehru in a letter of January 1962, "When the Canadians handed over the reactor at the end of 1960 it could not be taken up to a power above 17 megawatts, and a number of difficulties, such as, growth of algae in the primary system, corrosion, pressure drop in the rods, rupturing of the rods, etc., impeded its operation even at a relatively low power level." Bhabha's team overcame each of those challenges on its own....

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For stage two of his nuclear program, Bhabha needed to extract the plutonium from spent CIRUS reactor rods.... Vitro drew up the engineering plans, and architect Edward Durell Stone brought them to life on the Trombay shoreline....Bhabha gave BARC's modular laboratory building—called the longest building in Asia—the same scrutiny he gave TIFR...

For decades TIFR and BARC remained elite research institutes, with relatively few connections to India's chronically underfunded universities. Saha had introduced a nuclear-physics curriculum at Calcutta University in 1939, on the theory that India should train its own future nuclear scientists. Bhabha staffed his institutes with Indian physicists trained in Western institutions and supplemented them with homegrown talent. Although it remains a research institute, TIFR now offers its own PhD degrees. It has also opened a satellite campus in Hyderabad with a small graduate program devoted to interdisciplinary sciences. BARC, meanwhile, has expanded its training school into the Homi Bhabha National Institute, which offers doctoral degrees in nuclear science and engineering.

Bhabha's successors have ensured that TIFR and BARC continue to flourish. Those institutions stand today as living testaments to Bhabha's conviction that the scientific enterprise can and must be enhanced by architecture and art. Much like his US contemporary physicist Robert Wilson—the accelerator builder, sculptor, and amateur architect who designed and built Fermilab18—Bhabha believed that the sciences and the humanities exist in the same nexus of truth and beauty, forever enhancing and shaping one another.

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Source: Stuart Leslie is a professor in the department of history of science and technology at Johns Hopkins University in Baltimore, Maryland. Indira Chowdhury is the founder and director of the Centre for Public History at the Srishti Institute of Art, Design and Technology, Bengaluru. Excerpted from https://physicstoday.scitation.org/ , 01 September 2018.

OPINION – Sydney J. Freedberg Jr

Will the Army's 1,000-Mile Missiles Kill Reagan's INF Treaty?

The arms control community is up in, well, arms over the Army's plan for missiles with a thousand-mile range. Such weapons could blow holes in Russian or Chinese defenses in a major war – but their first victim may well be an ailing arms control agreement, the INF treaty.

The fundamental questions: Is it worth trying to save the treaty, even though the Russians are cheating and the Chinese never signed? Is it better to void a treaty that binds our hands and build new weapons, even at the risk of an arms race? Could we do both at once, the way Ronald Reagan deployed the nuclear-tipped Pershing II to Europe – tremendously controversial at the time – to successfully pressure the Soviets into signing the INF treaty in the first place 30 years ago? Would such a peace-through-strength approach only alienate our allies and scare today's more volatile Kremlin into doing something dangerous?

At stake is the 1987 INF accord, which banned ground-launched weapons with ranges between 500 and 5,500 kilometers (312 to 3,338 miles). That left both sides' strategic nuclear deterrents and tactical rocket artillery intact, but it dismantled the most destabilizing weapons, like the US Pershing II and the Russian SS-20: mid-range missiles, based in Western or Eastern Europe, that could reach Moscow or NATO capitals with only a few minutes' warning.

Congress, for its part, is fed up with Russia. It recently passed a 2019 defense bill that includes a non-binding Sense of Congress to encourage (but does not require) the administration to "suspend" the INF treaty and work on new weapons. That builds on an earlier provision in the 2016 bill encouraging (but not funding) the Pentagon to study "counterforce capabilities to prevent intermediate-range ground-launched ballistic missile and cruise missile attacks, (and) countervailing strike capabilities...whether or not such capabilities are

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... Tomorrow's mission-critical decisions will rely on multi-domain C2. Today, Raytheon is integrating the best defense systems with the best commercial technologies to make it possible. So it's not Congress that lacks respect for the treaty, it's Russia, and we need to act. "That treaty is a cornerstone of our national security and European security," the staffer told me. "If the treaty's being violated, we have to take steps to ensure that stability some other way.... As they have done throughout their history, hopefully they will respect strength when they choose to disregard law."

Will this work? "Putin is no Gorbachev and Trump is no Reagan," said Alexandra Bell, a former State Department official now with the Center for Arms Control & Non-Proliferation. We can try to replicate the 1980s' power play, she said, "but it's a really large gamble....with the way our alliances have been weakened – by choice on the part of the US president – that we'd be able to replicate the breakthrough that happened at Reykjavik."

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On the upside, there is one big positive difference between then and now. In the 1980s, the US Army was deploying nuclear weapons. Today, it's just talking about conventional explosives. These would be precision weapons to take out military targets with (hopefully) a minimum of collateral damage, not weapons of mass destruction. But in interviews with arms control experts, they kept coming back to the nuclear implications. Why?

Despite its name, the INF accord restricts conventional weapons too, because it bans wide categories of missiles that could carry a nuclear warhead. One no-longer-valid reason is that, back in 1987, almost all such missiles were nuclear because precision guided munitions were new and unproven. Historically, anything you fired 1,000 miles would be so inaccurate you'd need a nuke to ensure you hit the target, like hitting a bulls-eye with a bulldozer.

But even today, when you can target precisely enough over such distances to make a nuclear warhead unnecessary, there's no way the enemy can tell whether the warhead was a nuke or not until it hit. Russia or China could mistake a salvo of incoming conventional weapons for a nuclear strike and launch Armageddon in response.

The Army insists these missiles won't have nuclear warheads, I repeated with increasing frustration. They won't even be the same kind of missile the US uses for nukes, flying different profiles that are visible on radar. Theoretically, we could develop a nuclear variant in secret, but....Then it hit me: If I can't convince American arms control experts that these will never be nukes, how can the US government convince the Russians? ...

What's Banned, For Whom?: Despite the "N" in its name, the INF treaty bans any US or Russian ground-launched missile, ballistic or cruise, that could carry a nuclear warhead between 500 and 5,000 kilometers, even if it's conventionally armed. In other ways, the INF is strangely narrow. It only governs ground-based weapons, not ones launched from aircraft, ships, or submarines.

The Kremlin has long said this formulation favors the US, with its globe-spanning air- and seapower, over the largely landlocked Russians. No less a figure than the Vice-Chairman of the Joint Chiefs of Staff, Gen. Paul Selva, has told Congress the US has enough air- and sea-launched systems to maintain the military balance with both Russia and China.

But many military leaders worry that increasingly sophisticated adversaries can hold US aircraft, ships, and even subs at bay with their own long-range smart weapons. These Anti-Access/Area Denial (A2/AD) threats would make a mobile land-based launcher an attractive backup. Such weapons could be cheaper, more numerous, and

more concealable than planes or naval vessels, basically launcher trucks that could hide out in tunnels or jungle islands, then roll out to retaliate.

"Right now, we are almost completely dependent on air forces and aviation assets in order to attack the A2/AD problem," retired NATO supreme commander Philip Breedlove said in 2016. "I submit – my opinion – that we need more long-range, survivable, precision-strike capability from the ground."

China is particularly important here because the INF treaty only binds the US and the Soviet Union's successor states (effectively, Russia). China was never asked to sign. It's also invested massively in the very class of weapons the INF Treaty forbids: ground-based ballistic and cruise missiles with ranges of roughly 300-3,000 miles. Now, China maintains a much smaller nuclear arsenal that either the US or Russia, so the vast majority of these weapons have conventional warheads. But the Chinese arsenal today poses the same dilemma as the proposed US weapons could pose in future. You never know for sure whether the incoming warhead is a nuke or not until it hits.

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In contrast to China's massive arsenal, Russia appears to have only a single intermediate-range, ground-launched cruise missile, the 9M729. Like many Chinese missiles, but unlike the proposed US ones, these are so-called dual-capable weapons that could carry either a nuclear warhead or a conventional one. Unlike China, but like the US, Russia is bound by the INF Treaty, so the Russian missiles are illegal.

At least the Russian violation is relatively small, so far, compared to the Cold War arsenals the INF disbanded. Arms control experts fear that if the US undermines or outright abandons the treaty, Russia will respond without restraint. "Even if they're violating, they're somewhat constrained," said Lynn Rusten, a former NSC and State Department staffer now with the Nuclear Threat Initiative. "I worry about a mutual decision to withdraw from the treaty and then all bets are off.... If there were no treaty, there'd be no limits."

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Can the US get the Russians to get rid of their INF-violating weapons without building treaty-busters of our own? "I don't know," said NTI's Rusten. "But my sense is they're starting to have a greater appreciation for the cost of this violation now that it's been exposed, (that) a classic arms race situation may not benefit their security."

"They are making some hints now they're willing to have serious conversation about it," Rusten continued. "For instance, people who are close to the government are floating ideas that they're willing to have it inspected." Allowing visual inspection of the missile wouldn't do much by itself, she said, but it's a big improvement over Moscow's previous insistence the 9M729 did not exist and could open the door to real concessions later on.

Another positive sign, added Bell, is that in Putin's March speech boasting of the Russian arsenal, one weapon system he did not talk up was the 9M729. "It kind of got lost in the whole simulated bombing of Mar-a-Lago," she told me, "(but) he talked about the development of new cruise capabilities and how probably they didn't even need them because of all these new strategic

weapons." That at least suggests the INF-violating missile is a potential negotiating chip.

"We ought to be putting our efforts at the moment to bring Russia in compliance," said Rusten. In fact, she and Bell both argued, the US can allay a lot of Russian concerns without giving up anything, by guaranteeing the Aegis Ashore missile defense systems now being built in Poland and Romania won't be used as offensive weapons. "That's clearly not our plan," Rusten said, so why not reassure the Russians by, say, allowing them to inspect the Aegis sites if we get to inspect the 9M729s? ...

The Nuclear Regulatory Commission recently restarted its review of a consolidated interim storage application for a site in Andrews County, Texas. And the NRC staff's safety, security and environmental reviews could be finished in summer 2020.

Source: https://breakingdefense.com/, 12 September 2018.

OPINION – Edward Klump

A Texas Waste Storage Plan is Back So is the Opposition

A proposal to send used nuclear fuel to West Texas didn't end last year, but it did stall during a trip to corporate purgatory. Now a joint venture called Interim Storage Partners LLC has the plan moving forward again. The Nuclear Regulatory Commission recently restarted its review of a consolidated interim storage application for a site in Andrews County, Texas. And the NRC staff's safety, security and environmental reviews could be finished in summer 2020.

The project is another flashpoint in a long-running debate over nuclear energy and associated waste after a number of US nuclear plants stopped producing power or announced plans to close. Congress has considered legislation that could help pave the way for interim storage facilities in Texas and New Mexico as well as a longer-term site at Yucca Mountain in Nevada.

Critics are worried about what's brewing. They're asking questions and hoping for more public meetings. Some would like to halt the project. One of the chief opponents knows the proposal won't be easy to stop, but she's working to rally Texans and others against the plan. "Most people don't even know this is happening," said Karen Hadden, executive director of the Texas-based Sustainable Energy and Economic Development Coalition. "The public is unaware, and they're unaware of the risks that they are about to be exposed to."

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The spent fuel storage plan for West Texas is tied to Waste Control Specialists (WCS), which has endured financial issues and houses low-level radioactive waste in the region. A plan by Valhi Inc. to unload WCS to EnergySolutions collapsed in 2017. Early this year, J.F. Lehman & Co. announced that an investment affiliate had acquired WCS. That was followed in March by news of a planned venture involving Orano USA and WCS ....

The new Orano-WCS entity — now called Interim Storage Partners, or ISP — later sought a restart of the NRC review that was halted in 2017. In August 2018, the NRC said the revised application was acceptable but that additional information would be sought.... Jeff Isakson, chief executive of ISP, said in a recent statement that ISP looked forward "to an energized and timely process."

ISP said its venture initially is intended to store used nuclear fuel from shutdown reactor locations. That would lower the burden on US taxpayers and allow sites to be redeveloped, it said. The application is for 40 years, though it could be extended by decades. ISP outlined a first phase for storing 5,000 metric tons of heavy metal, which primarily is used uranium fuel. Reaching a capacity of 40,000 metric tons would involve future license amendments.

Construction and preoperational testing on the project could be finished by April 2022, according to an ISP environmental report. A license application with the NRC said Orano USA ultimately is majority owned and controlled by an entity of the French government. But ISP has said its governing officers and management board members are U.S. citizens.

ISP said in a statement that the joint venture "combines the strengths of Orano's decades of expertise in used nuclear fuel packaging, storage and transportation with WCS' experience operating a unique facility serving both the commercial nuclear industry and the US Department of Energy." There's a WCS information center in West Texas for people to seek more information. ISP also has a website about its plans.

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Much of nuclear waste critics' focus had turned to an interim storage proposal from Holtec International for New Mexico. That plan is also under review at the NRC.... While Hadden said there was "a nice reprieve" on the West Texas proposal, she said "the threat is ever-present and on the burner now."

Instead of using the proposed interim sites or Yucca Mountain, Hadden would like to see the US pursue a new location for a permanent repository that's geologically sound and uses improved storage technology. A public step in the process for the West Texas site was evident in late August: a meeting about the emergency response plan. Representatives of the NRC, ISP and other interested parties attended in person in Maryland or on the phone.

The meeting covered aspects of the response plan and gave people a chance to interact. At one point, a speaker said that "nobody lives anywhere near us." That was followed by a description of the location as "in the middle of stinking nowhere." The remarks drew laughter as well as an unhappy response from a listener on the phone who wasn't sure who made them. "There was a statement made about this site being in the middle of nowhere, and there was some snickering and giggling," said Monica Perales, an attorney. "I live in the middle of nowhere, and that's not appreciated."

In an interview, Perales said the attitude during the meeting "made me feel as though we in West Texas are expendable." She is a staff attorney with Fasken Oil and Ranch Ltd. of Midland, Texas. Perales said the company has concerns about how the project could affect its interests in the Permian Basin. "The intent of the comments was to emphasize the benefit of there being no residences within ISP's Emergency Planning Zone for nearly four miles from the site in all directions," Isakson said in the statement. ...Hadden sought information during the August meeting call about remediation plans if something were to happen. She was told the emergency plan establishes a framework and that more details would be developed in the future.

View from the NRC: Before the call ended, Tom "Smitty" Smith, an environmental activist in Texas who works on special projects for Public Citizen and is married to Hadden, unloaded on the NRC. "I want to point out that we're having an

emergency because our regulatory agency is failing to allow citizens to ask questions that are appropriate to protect themselves," Smith said, adding: "Our mouths are being taped shut because of actions by this commission."

An NRC representative said the meeting was ending due to time constraints and that some questions were beyond the meeting's scope. He said various venues are available for questions and concerns. In a statement.... David McIntyre, an NRC spokesman, said time can run short when several people are interested in speaking during a meeting. He said the staff does its best to accommodate people who want to speak.

McIntyre said the public generally can participate in this sort of licensing review in three ways — during the public comment on a scoping period and a draft environmental impact statement, through petitioning for an adjudicatory hearing, and by asking questions of NRC staff during certain technical meetings. In a recent interview, Isakson of ISP said the NRC has a pretty good process to handle a license application. There's an "opportunity for the public to be involved as part of that," he said.

Opponents have raised questions about the WCS site in the past and its potential effects on the environment, but ISP praised the location. ISP said the area includes a "formation of almost impermeable red-bed clay in a relatively remote, semi-arid, sparsely inhabited area." The plan to store used nuclear fuel there has seen support over the years from some leaders and residents in the region.

...A couple of key dates are approaching in terms of the NRC review of the West Texas storage proposal. Parties that wish to comment on the scope of the environmental impact statement should submit comments by Oct. 19. Previously received comments on that aspect will be considered by staff, the NRC said. Those that want to request a hearing related to the current license application should do so by 29 October 2018.

McIntyre noted that ISP's application and the NRC's review is specific to the storage facility. If a license were granted, he said, ISP would decide what transportation packages and routes to use. "The packages and routes would have to be approved by the NRC," McIntyre said. "ISP can choose from package designs previously certified by the NRC staff, or submit a new design for our review and approval." ISP said its license application refers to used nuclear fuel being sent to the interim storage site by rail. Existing rail infrastructure could be expanded to help accommodate such deliveries.

Not Taken for Granted: Critics remain concerned about transportation, including the potential effects on cities and the potential for terrorists to target waste. Hadden has called for public meetings in places such as Dallas, Houston, San Antonio, Midland, El Paso and Andrews County to discuss issues related to possible interim nuclear waste storage in Texas. She's working on a public awareness campaign that's expected to take place later this month and run into October, featuring a full-scale mock radioactive waste transport cask.

Hadden argued future NRC requests for additional information could bring up new issues the public should be able to examine, so NRC deadlines should be extended. Critics say there is already a new financial situation to analyze in terms of ISP's involvement. McIntyre said that once a draft environmental impact statement is completed — which could be in about a year — it would be typical to return to the region for public meetings and present draft conclusions and take public comments on the report. The Federal Register ended up running a correction regarding the date by which a hearing should be requested in the ISP proceeding — changing it to Oct. 29 from Aug. 29. That was necessary because of what McIntyre called a mistake made at the printer. Hadden saw a bigger theme at play.

...Questions also remain about potential congressional action that could amend the Nuclear Waste Policy Act. The House passed a bill this year to help reform U.S. nuclear waste management (Greenwire, May 10). It would need to pass in the Senate to move forward, though the outlook is uncertain. In May, the CEO of the Nuclear Energy Institute praised the House vote as a step toward

implementing "the federal government's statutory obligation to manage used nuclear fuel."

ISP said "clarifying" the role of DOE in used fuel management would be welcome. But the venture insists that, even without a policy change, developing a private interim storage site would give fuel owners another cost-effective option.... The ISP CEO said his company is pleased to be involved in Andrews County. And he said WCS and Orano have a strong safety culture.

Source: https://www. eenews. net/stories/ 1060096457, 11 September 2018.

OPINION – John Kotek

How Utah is Pioneering a Future with Clean Nuclear Energy

The professionals who operate our electric grid will remind us it is a system that must be kept in balance at all times, constantly matching electricity generation with demand. Because of that necessity, achieving both a cleaner and an affordable energy future is going to require a mix of zero-emissions electricity resources. Solar and wind power will play important roles, but because they don't produce electricity around the clock they need to be complemented by clean resources that can provide the necessary balance. That's where nuclear energy comes in.

Today, nuclear energy generates about 20 percent of US electricity, and more than half of the nation's carbon-free power. In fact, we get about two-and-a-half times more electricity from nuclear energy than we do from wind and solar power combined. But we haven't been building many new nuclear power plants in recent years due to several factors, including relatively flat electricity demand, the high cost and long construction timelines for large nuclear plant designs, and the increasing availability of low-price natural gas.

Innovators in the nuclear field know we can get to a cleaner energy future a lot faster if we start building more nuclear plants, both in the U.S. and around the world. So they have been working on smaller plant designs that can cost less and take less time to build. The new plant design that is furthest along is the NuScale small modular reactor, or SMR, that was pioneered by a researcher at Oregon State University with help from my former colleagues at the Idaho National Laboratory. The NuScale design takes the best from reactor designs that have been proven over the past 50 years and adds in new safety and reliability features to create a potentially game-changing new design.

The Utah Association of Municipal Power Systems, or UAMPS, is considering construction of a NuScale SMR on the Idaho National Laboratory site, about three hours north of Salt Lake City, not too far from my former home in Idaho Falls. UAMPS is an organization where communities come together to cooperatively meet their energy needs; while most of the 40-plus UAMPS members are from Utah, others come from California, Idaho, Nevada, New Mexico and Wyoming. The clean electricity from the SMR would replace some of the coal-fired electricity currently generated at plants scheduled to be retired in the next several years.

UAMPS leaders are leveraging the pioneering nature of the project to their advantage, securing the same types of incentives and risk-reduction that have allowed wind and solar energy to expand dramatically. For example, the SMR project is qualified to receive federal production tax credits modeled after those given to wind energy for nearly 25 years. The project is also eligible for a federal loan guarantee, which will reduce borrowing costs. The state of Idaho has passed tax incentives to help spur construction of the project. And finally, during my time running the U.S. Department of Energy's Office of Nuclear Energy, we signed an agreement granting UAMPS a permit to use federal land on the Idaho site, a site where 52 nuclear reactors have been built over the decades and four are still in operation.

Add to all of this the strong public and political support of the communities around the region and the determination of both the Trump administration and Congress to see the SMR project through, and you've got a recipe for a cleaner energy future for communities across Utah and beyond.

Source: John F. Kotek is vice president of policy development and public affairs at the Nuclear Energy Institute. Deseret News, 31 August 2018.

NUCLEAR STRATEGY

USA

Cuts to Nuclear Spending and Special Ops Oversight

If Democrats take the House in November 2018, expect the new leadership of the House Armed Services Committee to train a skeptical eye on President Donald Trump's nuclear weapons plan and attempt to rein in the Pentagon's actions around the globe. Speaking at the second annual Defense News Conference, Rep. Adam Smith, the Washington representative who would become the HASC chairman if the parties flip, laid out his vision for what a Democratic HASC would look like.... "When we look at the larger budget picture, that's not the best place to spend the money."

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Smith later added that the expected price tag for upgrading America's nuclear weapons — one potential estimate was $1.2 trillion over the next 30 years before the Pentagon's plans for two new systems were revealed — meant the US "certainly can't afford it."...

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More broadly, Smith said he wanted the HASC to "step up" on oversight of what he called an "expansive" military taking part in operations all over the globe.... "The Trump White House, by and large, has let the Pentagon have a lot of free rein," Smith said. "I think that's inappropriate, and I think there is a real role for congress to step in where the White House has stepped back to make sure our military is not engaged in ways" contrary to American values or interests.

Source: https://www.defensenews.com/, 07 September 2018.

BALLISTIC MISSILE DEFENCE

IRAN

Iran Claims Successful Ballistic Missile Intercept Test

The Bavar-373 long-range air defence system that Iran is developing has successfully passed ballistic missile interception tests, Iranian news agencies reported the country's deputy air defence commander as saying on 10 September 2018. Fars News Agency cited Brigadier General Mahmoud Ebrahiminejad as saying "a positive and very good test was conducted" last year.

Fars also reported that the deputy commander said that Iran is working on its own version of the Russian Pantsyr air defence system, which is armed with both missiles and 30 mm guns and is designed to protect high-value targets by destroying incoming guided weapons. Tasnim News Agency quoted Brig Gen Ebrahiminejad as saying the Bavar-373 is "more powerful and reliable" than the S-300PMU2 systems Iran received in 2016, although the brigadier general added that its primary advantage over the Russian system is that it is entirely made in Iran.

Source: https://www.janes.com/, 12 September 2018.

NUCLEAR COOPERATION

IAEA–SUDAN

IAEA Reviews Sudan's Nuclear Power Infrastructure Development

An IAEA team of experts has concluded an eight-day mission to the Republic of Sudan to review its development of infrastructure for a nuclear

power programme. The Integrated Nuclear Infrastructure Review (INIR), which ended on 03 September 2018, was conducted at the invitation of the Government of Sudan.

The INIR mission reviewed the status of nuclear infrastructure development using the Phase 1 criteria of the IAEA's Milestones Approach, which provides detailed guidance across three phases (consider, prepare, construct) of development. The end of Phase 1 marks the readiness of a country to make a knowledgeable commitment to a nuclear power programme.

Sudan, a country of approximately 40 million people, is seeking to increase its installed electricity capacity to support socio-economic development, particularly in the industrial, agricultural and mining sectors. The government has projected that demand for electricity will more than double to around 8500 MWe by 2031.

The INIR mission reviewed the status of nuclear infrastructure development using the Phase 1 criteria of the IAEA's Milestones Approach, which provides detailed guidance across three phases (consider, prepare, construct) of development. The end of Phase 1 marks the readiness of a country to make a knowledgeable commitment to a nuclear power programme. The INIR team was hosted by Sudan's Nuclear Energy Programme Implementing Organization (NEPIO), which is chaired by the Undersecretary of the Ministry of Water Resources, Irrigation and Electricity (MWRIE).

The team made recommendations and suggestions, highlighting areas where further action would benefit Sudan, including: finalizing national policies to support the nuclear power programme; strengthening plans to join international legal instruments and assessing and developing the country's legal and regulatory framework; implementing plans to support the development of key organizations and to enhance public awareness about the nuclear power programme; and further analyzing the preparedness of the electrical grid and approaches to funding, financing and radioactive waste management.

"We had good discussions during the mission which provided additional information to the team for each of the 19 infrastructure issues that are addressed during an INIR mission," said team leader Anthony Stott, Operational Lead of the IAEA's Nuclear Infrastructure Development Section. "It is evident that there is a strong commitment from the government of Sudan to developing the infrastructure needed for a safe, secure and peaceful nuclear power programme."

The INIR team said that Sudan's NEPIO serves as an effective mechanism for involving a wide and comprehensive range of national stakeholders in the relevant activities. Sudan has enacted a comprehensive nuclear law and established a nuclear regulatory authority. The country has completed a significant number of studies on different nuclear infrastructure issues which contributed to the development of a prefeasibility report. The INIR team noted that some of those studies may need to be reviewed and updated to better prepare the country for the next stages of the nuclear power programme.

The team comprised experts from Morocco, Slovenia, South Africa and Spain as well as IAEA staff. It reviewed the status of 19 nuclear power programme infrastructure issues using the IAEA Nuclear Energy Series Evaluation of the Status of National Infrastructure Development. Prior to the mission, which was supported by the African Division of the IAEA's Technical Cooperation Department, Sudan submitted a Self-Evaluation Report covering all infrastructure issues as well as supporting documents to the IAEA.

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national policies to support the nuclear power programme; strengthening plans to join international legal instruments and assessing and developing the country's legal and regulatory framework; implementing plans to support the development of key organizations and to enhance public awareness about the nuclear power programme; and further analyzing the preparedness of the electrical grid and approaches to funding, financing and radioactive waste management.

The team also identified good practices that would benefit other countries considering the introduction of nuclear power in the areas of national position and site and supporting facilities...

"Sudan has spent more than a decade developing infrastructure for its nuclear power programme, where nuclear safety and security are embedded in every aspect of activities, with excellent support from the IAEA," he said. "As we are hosting the INIR mission to evaluate Phase 1 of our programme, I would like to provide assurance that we are open to implementing the INIR mission recommendations and suggestions."

Integrated Nuclear Infrastructure Review (INIR) missions are based on the IAEA Milestones Approach, with its 19 Infrastructure Issues, 3 Phases and 3 Milestones. INIR missions enable IAEA Member State representatives to have in-depth discussions with international experts about experiences and best practices in different countries. In developing its recommendations, the INIR team takes into account the comments made by the relevant national organizations. Implementation of any of the team's recommendations is at the discretion of the Member State requesting the mission. The results of the INIR mission are expected to help the Member State to develop an action plan to fill any gaps, which in turn will help the development of the national nuclear infrastructure. The IAEA publishes the INIR mission report on its website 90 days after its delivery to the Member State, unless the State requests in writing that the IAEA not do so.

Source: https://www.iaea.org/, 07 September 2018.

RUSSIA–CHINA

Rosatom Starts to Load Nuclear Fuel at 4th Power Unit of Tianwan NPP

Russia's state civil nuclear power corporation Rosatom has started to load nuclear fuel at the fourth power unit of the Tianwan Nuclear Power Plant in China, Rosatom said in a statement. "On 25 August 25, 2018, at 7:20 p.m. (2:20 p.m. Moscow time), the first fuel assembly was loaded into the active zone of the reactor at the fourth power unit of the Tianwan NPP in China," the statement says.

Overall, 163 fuel assemblies are planned to be loaded into the rector of the NPP's fourth power unit. Nuclear fuel loading signifies the start of the stage of the power unit's launch into operation.

Overall, 163 fuel assemblies are planned to be loaded into the rector of the NPP's fourth power unit. Nuclear fuel loading signifies the start of the stage of the power unit's launch into operation. As the next stage, the power unit will be launched with its connection to China's power grid.

The second stage of the Tianwan NPP (the third and the fourth power units) is being built with the assistance of ASE, Rosatom's engineering division. Currently, three VVER-1000 power units built under the Russian project are operational at the Tianwan NPP. The Tianwan NPP is the largest facility of the Russian-Chinese economic cooperation. The first stage of the Tianwan NPP (the first and the second power units) was launched in 2007. The launch of the third power unit of the Tianwan NPP took place in December 2017.

Source: http://tass.com/economy/1018648, 25 August 2018.

RUSSIA–IRAN

Iran Resumes Talks With Russia to Build New Nuclear Power Plant

Iran has resumed talks with Russia to build a new nuclear power plant capable of generating up to 3,000 megawatts of electricity, energy minister Reza Ardakanian said according to the Tasnim news agency. The Islamic Republic currently has the capacity to produce 1,000 megawatts of nuclear electricity, Tasnim reported. Iran already runs one Russian-built nuclear reactor at Bushehr, its first. Russia signed a deal with Iran in 2014 to build up to eight more reactors in the country. The US in May 2018 pulled out of a deal between Tehran and major powers to limit Iran's nuclear ambitions, and Washington imposed new sanctions on Tehran in August 2018.

Source: Reporting by Babak Dehghanpisheh in Geneva; Editing by Ros Russell, Reuters 25 August 2018.

NUCLEAR ENERGY

GENERAL

IAEA Energy Projections See Possible Shrinking Role for Nuclear Power

Nuclear power's electricity generating capacity risks shrinking in the coming decades as ageing reactors are retired and the industry struggles with reduced competitiveness, according to a new IAEA report. The declining trend may set back global efforts to mitigate climate change, IAEA Director General Yukiya Amano said.

The 38th edition of Energy, Electricity and Nuclear Power Estimates for the Period up to 2050, provides detailed global trends in nuclear power by region. Its projections for nuclear electricity generating capacity are presented as low and high estimates, reflecting different driving factors that have an impact on the worldwide deployment of the low-carbon energy source.

In the low case to 2030, the projections show nuclear electricity generating capacity falling by more than 10% from a net installed capacity of 392 gigawatts (electrical) (GW(e)) at the end of 2017. In the high case, generating capacity increases 30% to 511 GW(e), a drop of 45 GW(e) from last year's projection. Longer term, generating capacity declines to 2040 in the low case before rebounding to 2030 levels by mid-century, when nuclear is seen providing 2.8% of global generating capacity compared with 5.7% today.

Overall, the new projections suggest that nuclear power may struggle to maintain its current place in the world's energy mix. In the low case to 2030, the projections show nuclear electricity generating capacity falling by more than 10% from a net installed capacity of 392 gigawatts (electrical) (GW(e)) at the end of 2017. In the high case, generating capacity increases 30% to 511 GW(e), a drop of 45 GW(e) from last year's projection. Longer term, generating capacity declines to 2040 in the low case before rebounding to 2030 levels by mid-century, when nuclear is seen providing 2.8% of global generating capacity compared with 5.7% today.

The wide range in the projections is also due to the considerable number of reactors scheduled to be retired around 2030 and beyond, particularly in North America and Europe, and whether they will be replaced by new nuclear capacity.

"The declining trend in our low projection for installed capacity up to 2050 suggests that, without significant progress on using the full potential of nuclear power, it will be difficult for the world to secure sufficient energy to achieve sustainable development and to mitigate climate change," Amano said. The wide range in the projections is also due to the considerable number of reactors scheduled to be retired around 2030 and beyond, particularly in North America and Europe, and whether they will be replaced by new nuclear capacity.

Nuclear power produced about 10% of the world's electricity in 2017, accounting for about one-third

of total low-carbon electricity. As of today, the world's 455 operating nuclear power reactors have a record level of 399.8 GW(e) total net installed capacity. Over the short term, the low price of natural gas, the impact of renewable energy sources on electricity prices, and national nuclear policies in several countries following the accident at Japan's Fukushima Daiichi Nuclear Power Plant in 2011 are expected to continue weighing on nuclear power's growth prospects, according to the report. In addition, the nuclear power industry faces increased construction times and costs due to heightened safety requirements, challenges in deploying advanced technologies and other factors.

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Still, interest in nuclear power remains strong in the developing world, particularly in Asia where countries such as China and India need huge amounts of electricity and also want to reduce greenhouse gas emissions. Commitments agreed to at the 21st session of the United Nations Climate Change Conference (COP21) could also produce a positive impact on nuclear energy development in the future, according to the publication.

Regional Trends: Northern America: Nuclear electricity capacity could decrease by almost one-third in 2030 in the low case or maintain output near 2017 levels in the high case. Latin America & the Caribbean: Nuclear electricity generating capacity is projected to increase in both low and high cases, but its role will remain small in the coming decades. Northern, Western and Southern Europe: Several countries in these regions have announced a gradual phase-out of nuclear power. Generating capacity is projected to fall by as much as 30% or slightly increase by 2030. Eastern Europe: Generating capacity is projected to maintain current levels or expand by 30% in the next two decades. Africa: In the low case, generating capacity is projected to remain at current low levels, with the possibility of greater expansion by 2050. Western Asia: Generating capacity is expected to increase significantly in the low and high cases. Southern Asia: Generating capacity is projected to continue to grow in both the low and high cases. Central and Eastern Asia: Nuclear electrical generating capacity is projected to increase significantly in both low and high cases....

The latest India-US Joint Statement reiterates that Westinghouse Electric Company would help set up six nuclear plants in India. But Westinghouse has had billions of dollars of cost overruns in its nuclear reactors in the US, and stands to gain from joining hands with NPCIL to better manage its project implementation.

Source: https://www.iaea.org/, 10 September 2018.

INDIA

India Can Export Nuclear Power Plants

Two-way trade in the nuclear power sector between the US and India would make eminent sense. The latest India-US Joint Statement reiterates that Westinghouse Electric Company would help set up six nuclear plants in India. But Westinghouse has had billions of dollars of cost overruns in its nuclear reactors in the US, and stands to gain from joining hands with NPCIL to better manage its project implementation.

The fact is that NPCIL has been able to streamline project implementation with standardised designs and equipment, and is implementing at least 10 new PHWRs nationally. In sharp contrast, the US, which is building nuclear plants after a long hiatus, seems to have rather rusty expertise when it comes to construction of nuclear power plants. Last year in 2017 WEC, owned by private equity firm Brookfield Business Partners, filed for Chapter 11 bankruptcy after design reviews of its new reactor by regulators and huge cost overruns in four nuclear reactors situated in southeast US.

There is much potential for export of India's indigenous PHWRs, and the Joint Statement rightly calls for India's "immediate accession" to the NSG. PHWRs use natural uranium oxide as fuel, doing away with costly enrichment. The newer NPCIL reactors are designed to be larger 700-MW plants, so as to reap economies of scale, and serial production of nuclear components would keep implementation costs relatively low.

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..Westinghouse and NPCIL do need to partner in the US, and elsewhere in the world afterwards. The Indo-US nuclear deal can surely benefit both nations in hitherto unexplored ways, for mutual gains.

Source: https://blogs.economictimes. indiatimes. com/, 07 September 2018.

Apsara, Asia's Oldest Research Reactor in Mumbai, Turned on After 9 Years

Apsara, Asia's oldest research reactor, is active again nine years after it was shut down. Located within India's nuclear weapons facility at the BARC in Mumbai, the reactor has been recommissioned with double its previous capacity.

Apsara is a highly versatile swimming pool-type of reactor that was built in August 1956. It was shut down in 2009 for a revamp. The research reactor's earlier French made enriched fuel has been replaced with an Indian made enriched fuel.

The Apsara reactor was utilised for various experiments including neutron activation analysis, radiation damage studies, forensic research, neutron radiography, and shielding experiments. The research reactor facility provides much needed isotopes for medical purposes and also helps refine the design of India's nuclear weapons.

"Nearly 62 years after Apsara came into existence, a swimming pool-type research reactor 'Apsara-upgraded' of higher capacity was commissioned. The reactor made indigenously uses plate type dispersion fuel elements made of low enriched uranium," BARC said in a statement.

The Apsara reactor was utilised for various experiments including neutron activation analysis, radiation damage studies, forensic research, neutron radiography, and shielding experiments. The research reactor facility provides much needed isotopes for medical purposes and also helps refine the design of India's nuclear weapons. "By virtue of higher neutron flux, this reactor will increase production of radio-isotopes for medical application by about 50 per cent and would also be extensively used for research in nuclear physics, material science and radiation shielding," the BARC release said.

Source: https://www. ndtv.com, 12 September 2018.

PAKISTAN

Pressure Vessel Installed at Pakistan's Karachi 3

The pressure vessel for unit 3 of Pakistan's Karachi nuclear power plant was put in place on 5 September, China National Nuclear Corporation announced. The development marked Karachi 3's entry into the "full installation phase of key components". The pressure vessel for the Chinese-supplied Hualong One reactor was designed by China Nuclear Power Research & Design Institute and manufactured by China First Heavy Machinery Company Limited.

The RPV installation came after the unit's three steam generators had been put in place. CNNC

said all four components had been installed within 19 days, providing "a useful reference for the construction of other similar power stations". They were installed using CNNC's new method using an E-frame to "flip" the components, which increases efficiency and safety, reduces labour intensity and minimises the chance of human error, compared with the traditional "fixed bracket" method. This is part of CNNC's "pre-introduction" construction method - where the main reactor equipment is installed before the dome of the containment building, which was first used in a reactor of this type at Karachi 2, also a Hualong One reactor. ...

Source: Nuclear Engineering International, 10 September 2018.

RUSSIA

The Nuclear Power Plant of the Future may be Floating Near Russia

Along the shore of Kola Bay in the far northwest of Russia lie bases for the country's nuclear submarines and icebreakers. Low, rocky hills descend to an industrial waterfront of docks, cranes and railway tracks. Out on the bay, submarines have for decades stalked the azure waters, traveling between their port and the ocean depths. Here, Russia is conducting an experiment with nuclear power, one that backers say is a leading-edge feat of engineering but that critics call reckless.

Moscow, while leading the trend, is far from alone in seeing potential in floating nuclear plants. Two state-backed companies in China are building such facilities, and American scientists have drawn up plans of their own. Proponents say they are cheaper, greener and, perhaps counterintuitively, safer. They envision a future when nuclear power stations bob off the coasts of major cities around the world.

...Rosatom, the Russian state nuclear company, has exported nuclear technology for years, selling plants in China, India and a host of developing nations. But smaller reactors effectively placed on floats can be assembled more quickly, be put in a wider range of locations and respond more nimbly to fluctuating supply on power grids that increasingly rely on wind and solar. Rosatom, the state nuclear company, is considering a schedule that would keep them on board for four months before a four-month break.

The Russian design involves using submarine-style reactors loaded onto vessels, with a hatch near the bow to plug them into local electrical grids. The reactors will generate a combined 70 megawatts of electricity, or enough to power about 70,000 typical American homes. Rosatom plans to serially produce such floating nuclear plants, and is exploring various business plans, including retaining ownership of the reactors while selling the electricity they generate.

The Russian design involves using submarine-style reactors loaded onto vessels, with a hatch near the bow to plug them into local electrical grids. The reactors will generate a combined 70 megawatts of electricity, or enough to power about 70,000 typical American homes. Rosatom plans to serially produce such floating nuclear plants, and is exploring various business plans, including retaining ownership of the reactors while selling the electricity they generate.

The bulky, rectangular structure resembles a big-box store, only with a nuclear emblem of an atom emblazoned on its side. Inside, the floating reactor is a warren of tight corridors, steep staircases, pipes, wires and warning signs in Cyrillic letters. Officials plan to tow the vessel to coastal cities in need of power, either for short-term boosts or longer-term additions to electricity supply. It can carry sufficient enriched uranium to power the two reactors for 12 years, before having to be towed, with its spent fuel, back to Russia, where the radioactive waste will be processed.

A rotating crew of about 300 Russians, including private security guards, will operate the plant. Rosatom is considering a work schedule where they will remain on board for four months at a time before taking a four-month break. The Akademik Lomonosov will start out serving Pevek,

a remote port in Siberia about 500 miles from Alaska, next year in 2019.

While on the vessel, the civilian crew will have access to a host of amenities, making the structure a sort of cross between the set for "The Hunt for Red October" and a cruise ship. Those aboard can swim in a pool decorated with pictures of a tropical beach, play squash or strangely, given the seeming importance of sobriety on such a vessel, have a drink at a bar.

Rosatom has so far not disclosed the cost of building the barge, or which countries are interested in buying electricity. The company estimates each floating plant will take four years to build, compared with a decade or so for many nuclear plants.

"Such a local source of electrical energy, which can easily be transported to difficult-to-access locations, is economically effective," Vitaly A. Trutnev, the director of Rosatom's floating reactor program, said in an interview in the captain's cabin, a suite decorated with orange upholstered chairs and wood laminate tables.

...A floating reactor, supporters say, would survive tsunami waves at sea. And if an emergency shutdown were needed, it would retain access to cooling, something that is easier to do if it is already in the water, rather than relying on pumps. Rosatom, in a statement, insisted its plant was "invulnerable to tsunamis." ...Placing nuclear reactors on vessels could also help reduce the costs of construction. Cost overruns, as well as political opposition, have all but halted nuclear plant construction in the US Assembly-line efficiencies at shipyards would help reduce costs.

...Rosatom has so far not disclosed the cost of building the barge, or which countries are interested in buying electricity. The company estimates each floating plant will take four years to build, compared with a decade or so for many nuclear plants. *The Sudan Tribune* has cited that country's minister of water resources and electricity as saying the government in Khartoum has a deal to become the first foreign customer. A Sudanese government spokesman, Mujahid Mohammed Satti, declined to comment on the report.

Others are also exploring the technology. China wants to build 20 floating nuclear plants, the first of which will start within two years. A French company has designed a reactor called Flexblue that would not float but rather be submerged on the ocean floor. But some environmental groups — even those open to a role for nuclear power as a substitute for traditional power plants — are skeptical.

...A floating reactor, its supporters say, would survive tsunami waves at sea. For one, they are not persuaded by Rosatom's assurances of safety. Critics worry that during a tsunami, the 21,000-ton steel structure might not ride out the wave. In a worst-case scenario, they say, it would instead be torn from its moorings and sent barreling inland, plowing through buildings until it landed, steaming and dented and with two active reactors on board, well away from its source of coolant.

The fact that the technology is well tested in Russian ships gives critics little solace, given a long history of spills and accidents involving nuclear-powered submarines and icebreakers operated by the Soviet and Russian navies.

In such a case, Rosatom says, a backup power source and coolant on board would prevent the reactors from melting down, at least for the first 24 hours. "During this time we would consider what to do," said Dmitri Alekseyenko, the deputy director for Rosatom's floating reactor program. Regulators in the US, however, require on-land reactors to operate for 72 hours in an emergency shutdown without external water supplies.

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Source: Andrew E. Kramer, New York Times, 25 August 2018.

NUCLEAR DISARMAMENT

GENERAL

Ratify CTBT: UN Chief to India, US

Although more than 180 countries have signed the CTBT, the treaty can only enter into force after it is ratified by China, Egypt, India, Iran, Israel, North Korea, Pakistan and the US UN chief Antonio Guterres reiterated his appeal to eight nations, including India and the US, to ratify the CTBT, saying the failure to bring it into force undermines global efforts to ensure a world free of atomic weapons.

"Every effort must be made to bring about the immediate entry into force of the Comprehensive Nuclear-Test-Ban Treaty, CTBT. Yet, more than 20 years since its negotiation, the Treaty has yet to enter into force," the Secretary General said at a high-level meeting…commemorating the International Day against Nuclear Tests. He said the failure to bring the treaty into force prevents its full implementation and undermines its permanence in the international security architecture.

"I reiterate the appeal made when I launched my disarmament agenda for the remaining eight States whose ratifications are required for the CTBT to enter into force to commit to sign the Treaty and complete their ratification processes. I urge all not to wait for others to act before moving forward," he said, adding that the complete and verifiable cessation of all nuclear tests is a vital pillar of a world free of nuclear weapons. He said CTBT has an essential role within the nuclear disarmament and non-proliferation regime.

Moreover, the UN chief pointed out that nuclear testing inevitably has a "catastrophic impact" on the environment, human health, food security and economic development. …Since the turn of the century, only the Democratic People's Republic of Korea, commonly known as North Korea, has broken this norm, leading to condemnation from the Security Council and repeated imposition of sanctions. What these tests have shown is that "no ad hoc measure can replace a global, legally binding ban on nuclear-testing," he underscored.

…Taking the podium, General Assembly President, Miroslav Lajcak, spoke of how nuclear testing escalates tensions. "They create openings for political miscalculations. And they bring us closer to the brink," he said. Turning to the CTBT, he bemoaned the fact that it has yet to become active….

Source: https://www.ndtv.com/, 11 September 2018.

NUCLEAR NON-PROLIFERATION

NORTH KOREAN

China Urges Relevant Parties to Adhere to Political Settlement of Korean Peninsula Nuclear Issue

China's attitude toward the Korean Peninsula nuclear issue has changed, which influenced the process of resolving the issue through negotiation between the US and the DPRK.

China's stance on the Korean Peninsula nuclear issue is consistent and clear, and China hopes all relevant parties adhere to the direction of political settlement, a Foreign Ministry spokesperson said…. Spokesperson Lu Kang made the comments when asked about recent remarks by the US that China's attitude toward the Korean Peninsula nuclear issue has changed, which influenced the process of resolving the issue through negotiation between the US and the DPRK. In response, Lu said those remarks went against basic facts and were irresponsible. China has expressed grave concerns and lodged solemn representations to the United States.

"For many years China has made unremitting efforts to and played an important and constructive role in pushing for the proper solution to the Korean Peninsula nuclear issue," Lu said. "China has always comprehensively and strictly implemented the resolutions of the UN Security

Council on the DPRK, which is obvious to all." Lu said China supports the US and the DPRK in actively advancing the process of political settlement to the issue according to the consensus reached by the two countries' leaders in Singapore.

However, he added that all relevant parties should stick to the direction of political settlement, and show more sincerity and flexibility, instead of being fickle or laying the blame on others. "China will continue to keep close communication with relevant parties and play a positive role in achieving the denuclearization of the Korean Peninsula and lasting peace and stability of Northeast Asia," he said.

Source: http://www. xinhuanet.com/, 26 August 2018.

Kim Jong-un Says he Wants Denuclearization in Trump's Current Term

Offering an olive branch to President Trump, Kim Jong-un told a South Korean envoy that he wanted to denuclearize North Korea before Mr. Trump's current term ends in early 2021.... Expressing frustration over what he called Washington's failure to negotiate in good faith, Mr. Kim told the envoy, Chung Eui-yong, that he still had confidence in Mr. Trump.... Mr. Chung was sent by President Moon Jae-in of South Korea to Pyongyang, the North Korean capital, hopes of reviving the stalled talks between the North and the US over how to denuclearize North Korea. Mr. Moon plans to go to Pyongyang on 18 September 2018 to meet with Mr. Kim and discuss improving the Koreas' relationship, including potential economic cooperation.

China will continue to keep close communication with relevant parties and play a positive role in achieving the denuclearization of the Korean Peninsula and lasting peace and stability of Northeast Asia.

Mr. Chung was sent by President Moon Jae-in of South Korea to Pyongyang, the North Korean capital, hopes of reviving the stalled talks between the North and the US over how to denuclearize North Korea.

...Mr. Chung said Mr. Kim gave him messages to relay to Washington, which officials said were being sent to his American counterpart, John Bolton, Mr. Trump's national security adviser. Mr. Chung did not reveal their contents, except to say that Mr. Kim wanted Washington's assurances that he had not made a mistake when he committed to the denuclearization of the Korean Peninsula. Taken at face value, Mr. Kim's remarks, as relayed by the South Korean envoy, signaled that North Korea was willing to strike a denuclearization deal personally with Mr. Trump, who has been more eager to engage North Korea than any of his predecessors. They also suggested Mr. Kim could accept the rapid denuclearization the Trump administration has sought — for the right incentives...

"Kim Jong-un is buying time," said Lee Byong-chul, a senior fellow at the Institute for Peace and Cooperation in Seoul. "He probably saw that there was nothing good in provoking Trump," especially when the American President "faces deepening legal trouble at home and disarray in his administration."

The North's state-run Korean Central News Agency said Mr. Kim had reaffirmed North Korea's commitment to denuclearize during his meetings with Mr. Chung. But it fell short of saying whether Mr. Kim would take major steps toward that goal. Mr. Kim has not offered to provide a full inventory of nuclear weapons and fissile materials, as Washington has demanded. Nor has Mr. Kim offered any detailed plan for disarmament.

He also repeated his country's longstanding demand that denuclearization must include the removal of a "nuclear threat" to North Korea, a common reference to American military exercises in the region.... But their diplomats' negotiations have since stalled over differences on how to carry out that vaguely worded agreement. Mr. Trump, after boasting that he had largely resolved the North Korean nuclear crisis, abruptly canceled Secretary of State Mike

Pompeo's planned visit to Pyongyang, citing a lack of progress in the denuclearization talks.

North Korea insists that it will move toward denuclearization only "in phases" and in exchange for "simultaneous" reciprocal concessions from Washington, a principle that Mr. Kim reiterated when he met with the South Korean envoy. Mr. Chung said Mr. Kim brought up a series of confidence-building measures his country has taken this year, such as a moratorium on nuclear and missile tests, demolishing his country's only nuclear test site and dismantling a missile engine-test facility.

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He said Mr. Kim objected to the skepticism that had greeted those actions in some quarters, such as the suspicion that North Korea could reactivate its nuclear test site. Mr. Kim said the underground site had been so thoroughly destroyed that no more tests could be carried out there. Mr. Kim also said the facility for testing missile engines was the only one in the North, and that its removal therefore meant a "complete halt to tests of long-range ballistic missiles," Mr. Chung said.

...Lee Sung-yoon, a professor of Korean studies at Tufts University, said that in its eagerness to improve ties, South Korea was coddling the North and exaggerating its willingness to denuclearize. He said Mr. Chung would take "happy" messages from Pyongyang to the White House and argue that Mr. Trump "can do business with Kim."

Source: New York Times, 06 September 2018.

IRAN

Trump to Chair UN Security Council Meeting on Iran

US President Donald Trump will chair a UNSC meeting on Iran this September 2018 to spotlight its "violations of international law" during the annual gathering of world leaders in New York, US Ambassador Nikki Haley said.... The US which holds the council presidency for September 2018, has unsuccessfully pushed the Security Council to call out Iran. Haley has regularly attacked Iran, accusing it of meddling in the wars in Syria and Yemen.

Haley told reporters Trump was chairing the meeting "to address Iran's violations of international law and the general instability Iran sows throughout the entire Middle East region." Diplomats said Iran could request to speak at the 26 September 2018 meeting, the high-level week of the UNGA. Iranian President Hassan Rouhani is expected to address the assembly on 25 September 2018.

Russia's Deputy UN Ambassador Dmitry Polyanskiy said the Iran meeting should focus on the implementation of a 2015 resolution on Iran. "We very much hope that there will be views voiced in connection with the US withdrawal" from a 2015 international nuclear deal, Polyanskiy told the council. Trump in May 2018 withdrew from the accord between Iran and six world powers aimed at stalling Tehran's nuclear capabilities in return for lifting some sanctions. Trump ordered the reimposition of US sanctions suspended under the deal.

Russia's Deputy UN Ambassador Dmitry Polyanskiy said the Iran meeting should focus on the implementation of a 2015 resolution on Iran. "We very much hope that there will be views voiced in connection with the US withdrawal" from a 2015 international nuclear deal.

...In February 2018, Russia vetoed a US-led bid for the Security Council to call out Tehran for failing to prevent its weapons from falling into the hands of Yemen's Houthi group, a charge Tehran denies....

Source: Reuters, 04 September 2018.

NUCLEAR PROLIFERATION

NORTH KOREA

North Korea is Still Making Nukes, and the Trump Admin is Taking a Harder Line

As President Donald Trump issues a steady stream of praise for Kim Jong Un in interviews

and on Twitter, a steady stream of evidence that North Korea is still making nuclear weapons has pushed his administration to take a much more aggressive stance toward Pyongyang.

The newest intelligence shows Kim's regime has escalated efforts to conceal its nuclear activity, according to three senior US officials. During the three months since the historic Singapore summit and Trump's proclamation that North Korea intends to denuclearize, North Korea has built structures to obscure the entrance to at least one warhead storage facility, according to the officials. The US has also observed North Korean workers moving warheads out of the facility, the officials said, though they would not speculate on where the warheads went.

The newest intelligence shows Kim's regime has escalated efforts to conceal its nuclear activity During the three months since the historic Singapore summit and Trump's proclamation that North Korea intends to denuclearize, North Korea has built structures to obscure the entrance to at least one warhead storage facility, according to the officials.

...One former senior US official said North Korea frequently moves equipment around to hinder foreign intelligence gathering. "They're trying to move them around so our sensors are confused," the official said. US intelligence assesses North Korea could produce five to eight new nuclear weapons in 2018, according to three current and former senior US officials. That pace is virtually identical to their assessment of the regime's production of about six per year prior to the Trump-Kim summit.

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Bruce W. Bennett, a senior international/defense researcher at the RAND Corporation and an expert in Northeast Asia military affairs, agrees with that assessment of the pace of production. "Since the beginning of 2018, Kim has surrendered and dismantled no nuclear weapons, but has likely built five to nine new nuclear weapons. So he has not frozen his nuclear program and he has certainly not been denuclearizing; instead, he has been nuclearizing." The Trump administration has launched what it calls a "maximum pressure" campaign against North Korea in response. Public rhetoric, meanwhile, has a different tone. After his June 2018 meeting with Kim in Singapore Trump said, "There is no longer a Nuclear Threat from North Korea."

Recently North Korea held its annual Foundation Day military parade to commemorate the 70th anniversary of the founding of the nation on 09 September 2018. In past years, the Kim regime has used the parade to show off missiles and new technology. This year, however, North Korea did not display any ICBMs. On Twitter, Trump said "experts" were heralding the absence as a sign of the Kim regime's "commitment to denuclearization." He thanked Kim and called the lack of missiles a "very positive statement."

A spokesperson for the National Security Council said, however, that Trump is personally directing the pressure campaign against North Korea. "The president closely directs every aspect of the administration's DPRK policy including the negotiations and the pressure campaign. He is clear-eyed about the challenges and sees this as a unique and fleeting opportunity to use diplomacy to achieve our objectives." But North Korea's recent actions have challenged the Trump team's pressure campaign, and now the administration is looking for ways to bolster it.

The first sign of the shift will be at sea, officials said, where an international maritime coalition will step up its efforts to expose ships and nations that are evading sanctions with illegal transfers of goods between ships at sea, according to three senior US officials.

Trump Calls Off Talks: NBC News reported that China has escalated both legal and illegal trade with North Korea since the Singapore summit, in defiance of sanctions. North Korean trucks are once again rolling over the border, Chinese tourists are flying to Pyongyang, and China has accepted shipments of North Korean coal by sea. North Korea marks 70th anniversary with huge parade, but holds back on advanced missiles.

Kim Jong Un says he's never criticized Trump, demands 'goodwill measures'. The international coalition, which includes military ships from the US, UK, France, Australia, New Zealand, Japan, and South Korea, has already been patrolling the waters for several months, but there is now an effort to "go active," according to one senior US official, meaning the coalition would begin to publicly denounce individuals who violate the sanctions at sea.

"There is an interest in getting more ships and aircraft to participate," one senior US official said, adding that the hope is partner nations will also enhance their presence. "It is about enhanced coordination on U.N. sanctions enforcement," the official said, including sharing intelligence with partners.

Japan announced plans for its naval forces — along with the United States — to operate out of Kadena air base to monitor and conduct surveillance of "illicit maritime activities" by North Korea, but did not offer more details. James Faeh, a former Pentagon desk officer focused on Korea, warns that more sanctions and shaming those who violate sanctions is not the way to force North Korea to denuclearize.

"This is highly unlikely to work," he said. "Keeping pressure on North Korea in a tangible way is the right path forward, but that has to involve outreach to other countries in the region and holding their feet to the fire about their cooperation with the brutal North Korean regime."

It's unclear whether new intelligence about North Korea's continued nuclear activity played a role in Trump's last-minute decision to pull Secretary of State Mike Pompeo from making a scheduled visit to Pyongyang for talks. Two people familiar with the matter said Pompeo, who'd become deeply familiar with the intelligence on Pyongyang as CIA director, went into talks with North Korea deeply skeptical that the effort would work, and the process has since only solidified his belief that it won't. Officials said he's far more optimistic that the US could cut a deal with Iran.

A former senior administration official briefed on the negotiation process said of Pompeo pulling back his trip to Pyongyang: "They're confronted with mounting evidence on all fronts that the North Koreans aren't cooperating." Another former senior administration official said Trump didn't want another news cycle with bad headlines out of North Korea before the midterms because that is one of his big foreign policy talking points....

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Pompeo was snubbed by the North Koreans during his last trip to Pyongyang and risked making another trip there with nothing to show for it, the official said. Pompeo named a special envoy to the North Korea issue, Steve Biegun, who is scheduled to visit Japan, China and South Korea in his new role. The US has yet to get China to play what administration officials see as a constructive role in diplomacy with North Korea. And Trump's outreach to Pyongyang has been complicated by strains in the US relationship with South Korea.

From the administration's perspective, South Korea has made a series of diplomatic slights to Trump — from seating arrangements for Vice President Mike Pence at the Olympics to the decision to serve shrimp from a disputed region at Trump's state dinner. South Korea has also made an aggressive push for the administration to take certain steps as part of its North Korea diplomacy.

South Korean President Moon Jae-in has pressured the White House to sign off on a declaration ending

the Korean War, a move Trump rebuffed this past summer. The rift between the two countries was papered over with the meeting between Trump and Kim, but has worsened now that diplomacy with Pyongyang is at a standstill.

Moon called Trump and is hoping for a meeting with the president this fall in the US He's also pushing for re-engagement between Trump and Kim. While there's renewed talk among administration officials of a possible second meeting this fall between Trump and Kim, it's unclear how serious the discussions are.

Source: Dan De Luce, https://www.nbcnews.com/ , 10 September 2018.

NUCLEAR SAFETY

JAPAN

Japan Nuclear Plant's Power Restored after Quake Triggers Hokkaido Blackout

Power was restored to a nuclear energy plant in Hokkaido, northern Japan…after a strong earthquake left it relying on emergency generators for 10 nervous hours, but it may be a week before lights are back on all over the major island.

Triggering a blackout just after 3 a.m. local time, the magnitude 6.7 quake left at least seven people dead, more than 100 injured and dozens missing on Hokkaido, an island of about 5.3 million people whose capital is Sapporo. A major coal-fired power station was also damaged in the temblor that shut down the grid.

The situation at utility Hokkaido Electric Power's (9509.T) three-reactor Tomari nuclear plant provided an uncomfortable, if comparatively brief, echo of the Fukushima Daiichi nuclear disaster in 2011. Reactors there melted down after a massive tsunami knocked out back-up generators, designed to maintain power to cool reactors in emergencies.

Though Tomari was shut down after the Fukushima disaster in 2011, it needs electricity to keep fuel rods cool, and had to rely on back-up diesel generators that kicked in after the quake until power was restored to all three reactors by 1 p.m. local time. …A Hokkaido Electric spokesman said the utility was not receiving any supplies from the island of Honshu to the south - home to Tokyo, Osaka and Nagoya - despite there being a 600 megawatt connection for transferring power from the coast of Japan's main island.

Source: Reuters, 06 September 2018.

USA

Senators: Suspend Rule on Nuke Safety Board Access

Letter by US Sens. Martin Heinrich and Tom Udall

Friday, 07 September 2018
Dear Secretary Perry:

Congress established the DNFSB as an independent safety organization in 1988 to address mounting health and safety concerns at DOE nuclear facilities across the country, which are largely unregulated by any other state or federal agency. We believe the board helps DOE fulfill its mission of maintaining a safe, secure and reliable nuclear deterrent.

We write in regard to DOE's new Order 140.1, Interface with the Defense Nuclear Facilities Safety Board, which severely limits the DNFSB's statutory oversight responsibility to ensure the safety of communities and workers at New Mexico's two nuclear security labs and the Waste Isolation Pilot Plant. We believe implementation of Order 140.1 must immediately be suspended while the members of the DNFSB, Congress and the public have time to review and offer constructive feedback on how to maintain and enhance the board's critical safety role.

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However, DOE issued the new order on working with the DNFSB on May 14, 2018, with no public notice or announcement in the Federal Register. Tellingly, DOE openly acknowledges it denied the board's request to review a draft version of Order 140.1.

Senator Martin Heinrich US Senator Tom Udall

On 28 August 2018, the DNFSB held the first of three public hearings on Order 140.1 where the immediate impacts of the new order were highlighted, including the staff's recent difficulties accessing information related to three safety issues at Los Alamos National Laboratory. All four board members spoke in unanimous opposition to the changes, citing fears the order violated the DNFSB's statutory authority to access important DOE facilities, documents and staff, in addition to diminishing its ability to offer formal safety recommendations directly to DOE. In addition, WIPP would be completely eliminated from the board's oversight.

We strongly support the mission of the DNFSB and oppose any attempt to weaken the board's ability to help protect health and safety in our communities. The board's expertise will be especially valuable as plans for production of plutonium pits are developed and implemented at LANL.

We strongly support the mission of the DNFSB and oppose any attempt to weaken the board's ability to help protect health and safety in our communities. The board's expertise will be especially valuable as plans for production of plutonium pits are developed and implemented at LANL.

In light of the many concerns about the changes made by Order 140.1, we urge you to suspend the new order to give the members of the board an opportunity to provide comments and feedback, including issues raised by stakeholders at the planned public hearings. DOE should then reissue an order that fully complies with the DNFSB's legal authority to continue to protect workers and the community.

We look forward to hearing from you.

Sincerely, Tom Udall Martin Heinrich

Source: This letter was sent, to Rick Perry, secretary of the US Department of Energy, by New Mexico US Sens. Tom Udall and Martin Heinrich. https://www.abqjournal.com/, 07 September 2018.

NUCLEAR WASTE MANAGEMENT

USA

Plans Move Forward for Privately Funded Storage of Nuclear Waste

The Trump administration has revived the discussion of using Yucca Mountain in Nevada as a repository for the nation's nuclear waste. Nevada officials remain opposed to the idea of putting spent nuclear fuel in long-term storage at a site about 100 miles from Las Vegas.

But while a bill to resurrect Yucca Mountain as a storage site moves through Congress, other groups have stepped forward with plans to site, build, and operate nuclear waste storage and disposal facilities in areas including Texas and New Mexico. Those plans have reignited the debate about what the U.S. should do with its nuclear waste, along with the discussion of whether the federal government or the individual states should take the lead in developing long-term storage plans.

The NRC says at least 12 U.S. reactors are committed to closing over the next five years, joining the more than 20 reactors shuttered over the past 10 years across the country. That's lot of spent nuclear fuel, in multiple locations, in need of safe storage, whether at an interim site or at a facility designed for long-term storage.

The NRC says at least 12 U.S. reactors are committed to closing over the next five years, joining the more than 20 reactors shuttered over the past 10 years across the country. That's lot of spent nuclear fuel, in multiple locations, in need of safe storage, whether at an interim site or at a

facility designed for long-term storage.

"If we can start moving fuel to an interim storage site, we're making progress," said Ward Sproat, former director of the Office of Civilian Radioactive Waste Management at the U.S. DOE, part of a panel discussing consolidated interim storage solutions for nuclear waste at ExchangeMonitor's RadWaste Summit at the Green Valley Resort in Henderson, Nevada, on September 5. ExchangeMonitor is a sister company of POWER magazine. "Interim storage has been done before. We have a bunch of interim storage sites around the country. Getting the license isn't the hard part, it's getting to the point of actually moving the nuclear waste."

"The safety record of our nuclear transportation industry is the envy of the world," said Eric Knox, vice president of Strategic Development, Nuclear & Environment, Management Services Group at AECOM. Knox moderated the panel. He echoed Sproat in saying transportation concerns have been a rallying point for those opposed to storage of nuclear waste, often using the phrase "mobile Chernobyl" in their opposition.

Interim Storage Sites in Development: Two members of the panel represented companies developing interim storage sites. Interim Storage Partners (ISP), a joint venture of Orano USA and Waste Control Specialists (WCS), is pursuing a license for a consolidated interim storage facility (CISF) for used nuclear fuel at an existing WCS disposal site in Andrews County, Texas. Holtec International, which has been acquiring nuclear plants that have closed or are scheduled to close in order to carry out their decommissioning, is developing a CISF in southeastern New Mexico, in a remote area between Carlsbad and Hobbs.

Jeffery Isakson, CEO of ISP, said Texas lawmakers have repeatedly supported radioactive waste disposal operations in the state. The NRC said it would resume it review of the ISP license application for the Texas facility, which had been suspended after being originally submitted in April 2016.

"Environmental impacts have been extensively analyzed in the region," Isakson said, adding the site has rail lines available that can handle loads including canisters of spent nuclear fuel. Other infrastructure for the site also is in place, and WCS opened a visitors' center in Andrews County, Texas, in June 2018.

Joy Russell, vice president of corporate business development and chief communications officer for Holtec, said her company formed a business unit—Comprehensive Decommissioning International—in a 2018 joint venture with SNC-Lavalin after SNC-Lavalin in 2017 acquired Atkins, a nuclear waste solutions company. Russell said the New Mexico site encompasses about 1,000 acres, with "about 500 acres being used to build the facility." Russell said the site, known as HI-STORE CIS, would use the company's HI-STORM UMAX technology, which stores loaded canisters of nuclear waste in a subterranean configuration.

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Russell said her group has a public-private partnership with the Eddy Lee Energy Alliance, representing Eddy and Lee counties in New Mexico, for the project, which she said has support from both local and state officials. "We're doing educational outreach in New Mexico," said Russell. "We do township meetings, where we testify before the mayor and town council. We meet one-on-one with candidates. We had to start with the basics. What people think of when they hear nuclear fuel, they think of the fuel you put in your car, and how that could leak into the ground. We have to educate people on what [nuclear] fuel is. We focus on safety, security, and technology."

Russell agreed that public concerns centers on the transport of nuclear waste. "The number-one

thing I hear, all the time, about consolidated interim storage is transportation." Holtec also has its license application before the NRC for review; Russell said it expect the agency will complete its review in July 2020, putting the New Mexico site on a timeline to receive its first shipment of spent fuel in 2023.

Revisiting Yucca Mountain: Congress first chose Yucca Mountain as a storage site for nuclear waste in 1987. Years of research into the site followed; estimates are that $15 billion was spent on the project. Sproat noted his efforts on licensing for Yucca Mountain before his retirement from the DOE, with a license application submitted to the NRC in 2008. The Obama administration ended funding for the project and halted the licensing process in 2009.

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Meanwhile, the Nuclear Waste Fund (NWF), which collected money from the states to finance waste storage projects, was ordered by a federal court in late 2013 to stop collecting that money until the federal government made provisions for collecting that waste. ...

President Trump earlier this year earmarked $120 million to restart the Yucca Mountain licensing process in his fiscal year 2019 budget. Sproat is not optimistic waste will ever be stored at Yucca, citing both timing and political issues.

"Assumptions that were made back in 2008, that the Nuclear Waste Fund was viable to operate Yucca Mountain, those are no longer valid," he said. "All of those assumptions are out the window. There's not enough money there at this stage of the game to operate and fund it." He continued: "Bottom line on Yucca is, I think we can defend that license application, but the Department of Energy needs to be a willing applicant to do that. But the time frames to be able to do that are getting shorter and shorter. There are two dynamics that run through all of these topics. Politics and time."

Source: Darrell Proctor, https://www.powermag.com/, 05 September 2018.

Centre for Air Power Studies

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Centre for Air Power Studies
P-284
Arjan Path, Subroto Park,
New Delhi - 110010
Tel.: +91 - 11 - 25699131/32
Fax: +91 - 11 - 25682533
Email: capsnetdroff@gmail.com
Website: www.capsindia.org

Edited by: Director General, CAPS

Editorial Team: Dr. Sitakanta Mishra, Hina Pandey, Anushree Dutta, Dr. Poonam Mann, Wg Cmdr Kaura, Sreoshi Sinha

Composed by: CAPS