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India

Gaganyaan Astronauts' Training in Russia Put on Hold Because of Pandemic
Prashant Rangnekar
The Wire, April 4, 2020

The training of Gaganyaan's four prospective astronauts in Russia has been put on hold as the facility where the exercise is being undertaken has been temporarily shut in the wake of coronavirus outbreak, sources said on Monday. The four test pilots of the Indian Air Force, chosen for India's first manned mission to space, have been undergoing training at the Yu.A. Gagarin Research and Test Cosmonaut Training Centre near Moscow since February.

However, since last week the centre has been shut due to coronavirus outbreak, sources said. Named after Yuri Gagarin, first human to journey into outer space, the Gagarin Research and Test Cosmonaut Training Center was built to support manned space programmes, space exploration activities, space engineering, cosmonauts' training, as well as ensuring their safety in space and providing post-flight rehabilitation programmes for cosmonauts.

https://science.thewire.in/space/gaganyaan-training-russia-hold-covid-19-pandemic/

Nuclear power plants of 7,000 MW capacity under construction in India
Energy World, April 5, 2020

Nuclear power plants of 7,000 megawatt (MW) capacity are currently under various phases of construction in the country, according to data shared by power minister R K Singh in parliament recently. The plants under construction include Unit 3, 4 and 5 of Kudankulam Nuclear Power Project of 3,000 MW capacity and a 500 MW capacity Prototype Fast Breeder Reactor in Tamil Nadu. Apart from this, there are two upcoming 1,400 MW capacity nuclear power plants including Kakrapar Atomic Power Plant in Gujarat and the Rajasthan Atomic Power Station. A 700 MW project, Gorakhpur Nuclear Power Plant, has also been planned on a 560 hectare area situated west of Gorakhpur village in Fatehabad district of Haryana.
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https://energy.economictimes.indiatimes.com/news/power/nuclear-power-plants-of-7000-mw-capacity-under-construction-in-india/74999671

4 Indian pilots training in Russia for Gaganyaan mission in self-isolation as a precautionary measure
Rezaul H Laskar
Hindustan Times, April 9, 2020

Four Indian pilots currently being trained in Russia for the Gaganyaan manned space mission have gone into self-isolation purely as a precautionary measure following the detection of nine Covid-19 cases in the Russian space agency, people familiar with developments said. The pilots from the Indian Air Force, being trained at the Yuri Gagarin Research and Test Cosmonaut Training Center at

Star City near Moscow, are all in good health and the self-isolation was part of the standard procedures for dealing with the situation, said people who spoke on condition of anonymity. “They have not been infected,” said one of the people cited above. There was no official word from the Indian side on the development.

https://www.hindustantimes.com/india-news/4-indian-pilots-training-in-russia-for-gaganyaan-mission-in-self-isolation-as-a-precautionary-measure/story-ccL7WeZAU21PZ6ZhudflRL.html

China

China's lunar rover travels over 424 meters on moon's far side
Global Times, April 1, 2020

China's lunar rover Yutu-2, or Jade Rabbit-2, has driven 424.455 meters on the far side of the moon to conduct scientific exploration of the virgin territory. Both the lander and the rover of the Chang'e-4 probe have ended their work for the 16th lunar day, and switched to dormant mode for the lunar night due to the lack of solar power, according to the Lunar Exploration and Space Program Center of the China National Space Administration. China's Chang'e-4 probe, launched on Dec. 8, 2018, made the first-ever soft landing on the Von Karman Crater in the South Pole- Aitken Basin on the far side of the moon on Jan. 3, 2019. Yutu-2 has worked much longer than its three-month design life, becoming the longest-working lunar rover on the moon.

The rover has helped scientists unveil the secrets buried deep under the surface on the far side of the moon, enriching human's understanding about the history of celestial collision and volcanic activities and shedding new light on the geological evolution on the moon. The scientific tasks of the Chang'e-4 mission include conducting low-frequency radio astronomical observations, surveying the terrain and landforms, detecting the mineral composition and shallow lunar surface structure and measuring neutron radiation and neutral atoms. The Chang'e-4 mission embodies China's hope to combine wisdom in space exploration with four payloads developed by the Netherlands, Germany, Sweden and Saudi Arabia. China plans to launch its first Mars probe and the Chang'e-5 probe to bring lunar samples back to Earth later this year. CNSA said it was making all-out efforts to carry out the missions amid the coronavirus pandemic.

http://www.globaltimes.cn/content/1184402.shtml

China to launch last satellite for BeiDou navigation system in May
Xinhua, April 6, 2020

China is expected to launch the last satellite for its BeiDou-3 Navigation Satellite System in May from the Xichang Satellite Launch Center in southwest China's Sichuan Province. The new satellite is the 55th satellite of the BeiDou Navigation Satellite System. It arrived at the launch site in Xichang on April 4, where it will be tested, assembled and fueled before the launch. The BDS family satellite is a geosynchronous earth orbit satellite. The BDS is China's independently developed and operated global satellite navigation system. China started to build the BeiDou-3 Navigation Satellite System in 2009. The launch of the 55th satellite represents the completion of the system.

http://www.xinhuanet.com/english/2020-04/06/c_138951001.htm

Satellite lost as rocket launch fails

Zhao Lei
China Daily, April 9, 2020

The attempted launch of one of China's Long March 3B carrier rockets failed on Thursday evening, resulting in the loss of a communications satellite that the country built for Indonesia, Xinhua News Agency has reported. The report said the rocket blasted off at 7:46 pm from the Xichang Satellite Launch Center in Sichuan province and had technical problems during its third stage before falling back to Earth. The satellite – PALAPA-N1 – was developed by the China Academy of Space Technology in Beijing to replace the PALAPA-D that was launched by a Long March 3B from the Xichang center in 2009. It was expected to provide broadcasting and broadband internet services across Indonesia.

https://www.chinadaily.com.cn/a/202004/09/WS5e8f31f3a3105d50a3d151c8.html

China delivering safety components needed by 'artificial sun' project
Global Times, April 12, 2020

The "artificial sun" project has made significant strides as the first batch of its safety components have been successfully delivered by China and is now on its way to France, the China National Nuclear Corporation (CNNC) said. According to the notice, the delivered components were pipelines for the gas injection system. The component plays an important role in the ignition, maintenance and control of the plasma, and can also play a part in the cleaning of the vacuum vessel wall. The construction of the pipeline requires extremely high manufacturing standards. The pipelines are expected to arrive in France in mid-May despite the coronavirus, Zhang Kai, chairman of the China Nuclear Industry 23 Construction Co, a subsidiary of CNNC, said in a report by China Radio International.

Apart from the safety components, progress has also been made on the construction of the Tokamak Assembly, which is a core part of the project. CNNC signed the Tokamak Assembly Contract 1 (TAC1) in 2019, and it was the biggest nuclear energy project contract bid by a Chinese company in the European market, according to a statement by CNNC. The artificial sun project, formally known as the international thermonuclear experimental reactor (ITER) project, is the development of a nuclear fusion reactor that is expected to generate clean energy through fusion technology. The reactor is located in Provence, southern France. An experimental reactor is expected to open in 2021, and large scale commercial use will commence around 2050, according to the schedule.

http://www.globaltimes.cn/content/1185355.shtml

Robot warriors join Chinese military arsenal, will free soldiers from dangerous missions
Liu Xuanzun
Global Times, April 14, 2020

More robot warriors are entering the arsenal of the Chinese military, with the latest additions being a small model that's equipped with a machine gun and a crane-like missile-loading robot, and experts said on Tuesday that robots will free human soldiers from heavy physical work and unnecessary danger. The Chinese People's Liberation Army (PLA) is in possession of the small
ground robot, which can traverse complicated terrains, accurately observe battlefield situations and provide ferocious firepower, the PLA Eastern Theater Command said on Sina Weibo on Monday when reposting a China Central Television (CCTV) report on the robot. The thigh-high robot looks

like a small assault vehicle. It walks on tracks similar to a tank, allowing it to adapt to complicated terrains in open field combat, move quickly and climb stairs, CCTV reported.

Equipped with a machine gun, and observation and detection equipment including night vision devices, the robot can replace a human soldier in dangerous reconnaissance missions, the report said. Target practice results showed the robot has acceptable accuracy, and the use of weapons still requires human control. New robot warriors joining the Chinese military have gradually become the norm, CCTV said. The PLA Rocket Force is receiving a large, crane-like robot that can be used in lifting and loading missiles onto transporter erector launchers, enabling more missiles to be launched from the same launcher within short intervals, CCTV reported on Sunday. A conventional crane is less steady and requires human assistance when loading missiles, but the robot solves this problem, CCTV reported. Unmanned systems will gradually free human soldiers from heavy physical work and extreme danger and let them focus on making combat decisions and carrying out technical and tactical movements, a military expert who asked not to be identified told the Global Times on Tuesday. Combat robots may attract more public attention, but support robots like the one the Rocket Force is using are also important to the military's overall combat capability, the expert said.

http://www.globaltimes.cn/content/1185595.shtml

China looks for new radioactive waste disposal sites
Hou Liqiang
China Daily, April 15, 2020

China will expand its three disposal sites for low- and medium-level radioactive waste and has been looking for new sites to address the country's inadequate disposal capacity for such waste, a National Nuclear Safety Administration official said. By the end of last year, a total of 16,000 cubic meters of low- and medium-level radioactive waste had been generated in the country's nuclear power stations, Jiang Guang, head of radioactive source management at the administration, said on Wednesday. With a combined disposal capacity of 76,000 cu m, the three disposal sites have received and disposed of 45,000 cu m of such waste, he added. By the numbers, China still has unused disposal capacity, but Jiang cautioned that "generally speaking ... the capacity is stressed and deficient".

In addition to the waste from nuclear power stations, there is still a large amount of waste left over from historical stockpiles and decommissioned nuclear facilities, he explained. Work has begun on selecting new sites, with the authorities preparing "to select locations and build new sites in provinces with relatively concentrated nuclear power development", he said. Jiang noted, however, that the work is confronted with challenges from the "not in my backyard" mindset and public fears about radiation.

https://www.chinadaily.com.cn/a/202004/15/WS5e96bdc4a3105d50a3d166f8.html

Pakistan

Reactor internals installed at second Hualong One unit in Pakistan
World Nuclear News, April 7, 2020

Installation has been completed of the reactor internals of the Hualong One reactor under construction at unit 3 of the Karachi nuclear power plant in Pakistan. Those for unit 2 were installed in January 2019. The units are scheduled for commercial operation in 2021 and 2022, respectively. Reactor internals are the major structures within a reactor pressure vessel that have one or more

functions such as supporting the core, maintaining fuel alignment, directing primary coolant flow, providing radiation shields for the reactor vessel, and guiding in-core instrumentation. Installation of the reactor internals at Karachi 3 was completed on 4 April, China National Nuclear Corporation (CNNC) announced today. The milestone, the company said, lays "a solid foundation" for the subsequent flushing of the unit's primary circuit and the start of cold tests. Karachi 2 and 3 are the first export of China's Hualong One design, with construction of unit 2 beginning in 2015 and unit 3 in 2016.

https://www.world-nuclear-news.org/Articles/Reactor-internals-installed-at-second-Pakistani-Hu

'Country making atom bomb can't make ventilators, test kits'
Mumtaz Alvi
The News International, April 11, 2020

Prime Minister Imran Khan Friday said Pakistan was a nuclear state but it was strange that it could not make its own ventilators and test kits and had to import them. In a private TV telethon, he urged the nation to adopt as much precaution as possible to check the fast spread of the novel coronavirus. He said besides using its own resources, the government was raising funds because the impact of the COVID-19 will worsen further. He emphasised that there was a danger of further spread of the virus and those confining themselves as much as possible would be safe. He said there was a greater risk of the virus spread in big gatherings and emphasised social distancing, as in case of rapid spread of the virus, pressure on hospitals would increase accordingly and there were not enough ventilators for 4 to 5 per cent people needing to be shifted to the ICU or needing emergency care. He said with increased care, there would be lesser spread of the virus. He noted that initially decisions weremade all of a sudden and one province straight away went for the lockdown, to which he had not agreed, as locking down 220 million people was an impossible thing to do.

https://www.thenews.com.pk/print/642649-country-making-atom-bomb-can-t-make-ventilators-test-kits

USA

U.S. Government Extends Bechtel Contract for Chemical Weapons Destruction
PR Newswire, April 1, 2020

The contract modification includes the construction of three new structures, which are called static detonation chambers, to destroy munitions that could not be easily processed by automated equipment at the Pueblo Chemical Agent-Destruction Pilot Plant (PCAPP). "The mission of this plant, our people, and our customer has international significance: to help rid the U.S. of chemical weapons," said Barbara Rusinko, president of Bechtel's Nuclear, Security & Environmental global business unit. "The team overcame the challenge posed by some munitions and is now simultaneously operating the main plant and building the new destruction facilities."
"This is an important achievement that helps the program continue our most important responsibility--maintaining the safety of the community, the workforce and the environment," said Michael S. Abaie, Assembled Chemical Weapons Alternatives program executive officer. "This puts us in a good position to complete the mission of the safe destruction of the chemical weapons stockpile stored at Pueblo Chemical Depot by December 2023 and the closure efforts that will follow."

The modification carries an estimated value of $1.2 billion. The work is being conducted under a cost-plus award fee contract to the U.S. Department of Defense Program Executive Office

Assembled Chemical Weapons Alternatives (PEO ACWA). The first-of-a-kind plant began pilot operations in 2016 after completing design, construction, and testing. The plant has now destroyed more than 1,300 U.S. tons of mustard agent - more than half of the stockpile in Colorado. When operations are complete, the team will have destroyed more than 2,600 tons of mustard agent in three types of chemical weapons: 155mm projectiles, 105mm projectiles, and 4.2-inch mortar rounds. Then, the Bechtel Pueblo Team will ultimately close PCAPP.

https://www.prnewswire.com/news-releases/us-government-extends-bechtel-contract-for-chemical-weapons-destruction-301033670.html

Trump Warns Iran of Heightened Retaliation for Any Attacks on U.S. Troops
Julian E. Barnes
The New York Times, April 1, 2020

President Trump warned Iran on Wednesday against using its proxy forces to attack American troops, vowing to retaliate by going "up the food chain," a hint that the American military was considering a more direct strike on Iranian forces. But senior Democrats cautioned Mr. Trump against attacking Iran without consulting Congress, a step he chose to forgo before the January killing of a top Iranian commander that pushed the countries to the brink of war. In a letter on March 27, Democratic leaders wrote that Mr. Trump must discuss with lawmakers any potential military actions overseas and noted that recent attacks on American forces in Iraq highlighted threats that could require a military response.

Mr. Trump strongly hinted on Wednesday that he was considering striking Iran if its proxy forces again attacked American troops and said his administration had "very good information" that Iran-backed militias were planning more assaults. Noting that the United States had retaliated after a strike in March by Kataib Hezbollah, an Iraqi militia with ties to Iran, Mr. Trump suggested that if proxy groups struck again, the United States was considering directly attacking Iranian forces.

https://www.nytimes.com/2020/04/01/us/politics/trump-iran-warning.html

NRC approves Crystal River licence transfer
World Nuclear News, April 2, 2020

The US Nuclear Regulatory Commission (NRC) has approved the transfer of the licence for Crystal River 3 from Duke Energy Florida to Accelerated Decommissioning Partners LLC subsidiary ADP CR3. The transfer will enable ADP CR3 to carry out active decommissioning of the former nuclear power plant. Duke applied for the licence transfer last June after deciding to pursue accelerated decommissioning of the single-unit pressurised water reactor plant and contracting with Accelerated Decommissioning Partners - a joint venture between NorthStar Group Services and Orano USA - to undertake the work. The plant, which was permanently shut down in 2013, had originally been slated for decommissioning using the so-called Safstor method of deferred dismantling, which would have taken some 50 years to complete. ADP CR3 plans to complete decommissioning by 2027.

Under its agreement with ADP CR3, Duke will remain the owner of the nuclear power plant, property and equipment, and will retain ownership and control of the trust fund that pays for the decommissioning, NRC said. ADP CR3 will become the NRC licensee responsible for decommissioning the plant in compliance with all state and federal regulations. NorthStar will also be contracted to demolish two permanently shut-down coal-fired units at the Florida site.

https://www.world-nuclear-news.org/Articles/NRC-approves-Crystal-River-licence-transfer

Outage management adapts to COVID-19
World Nuclear News, April 3, 2020

Electricity generation is vital in the response to the COVID-19 pandemic, but scheduled refuelling and maintenance outages at nuclear power plants around the world must still go ahead. Operators are introducing risk-minimising procedures so outages that have been planned years in advance can proceed, while some are being prompted to rethink or extend scheduled outages.
The head of the US Nuclear Energy Institute, Maria Korsnick, has written to US Energy Secretary Dan Brouillette urging federal support to ensure that such essential activities can be carried out during the COVID-19 pandemic. US utility Exelon has set up a dedicated website to share information on its ongoing maintenance outage at the Limerick nuclear power plant in Pennsylvania. Meanwhile, South Africa's Eskom and Sweden's Vattenfall have announced changes to outage plans at certain plants.

https://www.world-nuclear-news.org/Articles/Outage-management-adapts-to-COVID-19

Cold War nuclear bomb tests reveal true age of whale sharks
Science News, April 6, 2020

Atomic bomb tests conducted during the Cold War have helped scientists for the first time correctly determine the age of whale sharks. The discovery, published in the journal *Frontiers in Marine Science*, will help ensure the survival of the species -- the largest fish in the world -- which is classified as endangered.

Measuring the age of whale sharks (*Rhincodon typus*) has been difficult because, like all sharks and rays, they lack bony structures called otoliths that are used to assess the age of other fish. Whale shark vertebrae feature distinct bands -- a little like the rings of a tree trunk -- and it was known that these increased in number as the animal grew older. However, some studies suggested that a new ring was formed every year, while others concluded that it happened every six months.

https://www.sciencedaily.com/releases/2020/04/200406092845.htm

TVA and University of Tennessee agree SMR collaboration
World Nuclear News, April 9, 2020

The Tennessee Valley Authority (TVA) is to collaborate with the University of Tennessee, Knoxville (UT) to evaluate the development of a new generation of advanced nuclear reactors at TVA's Clinch River site. TVA has an early site permit from the US Nuclear Regulatory Commission for two or more small modular reactors at the site but has not yet taken a decision to build.

The memorandum of understanding will see TVA and UT work together on the evaluation and potential demonstration and operation of light-water or non-light-water fission reactors that build on the success of the current generation of reactors and will also leverage the expertise of UT's nuclear engineering department, TVA said. Such partnerships - a similar agreement was signed with Oak Ridge National Laboratory in February - are important steps Electricity generation is vital in the response to the COVID-19 pandemic, but scheduled refuelling and maintenance outages at nuclear power plants around the world must still go ahead. Operators are introducing risk-minimising

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https://www.world-nuclear-news.org/Articles/Outage-management-adapts-to-COVID-19

Europe

Who has the UK nuclear button while Johnson is ill? No comment
Reuters, April 7, 2020

The British government declined on Tuesday to say who had responsibility for the United Kingdom's nuclear codes while Prime Minister Boris Johnson is treated in intensive care for COVID-19 complications. When asked by the BBC if Foreign Secretary Dominic Raab had been handed the nuclear codes while Johnson received treatment, Cabinet Office Minister Michael Gove said: "There are well developed protocols which are in place."

https://www.reuters.com/article/health-coronavirus-britain-nuclear/who-has-the-uk-nuclear-button-while-johnson-is-ill-no-comment-idUSL8N2BV1Z5

Spot gains on forecast drop in wind and nuclear generation
Reuters, April 7, 2020

European spot power prices for day-ahead delivery rose in wholesale trade on Tuesday boosted by a forecast fall in wind power generation in Germany and France, while curve contracts were buoyed by gains in carbon emissions and oil prices. Germany's over-the-counter baseload power for the day-ahead delivery was up 7% at 24.95 euros ($26.81) a megawatt hour by 0935 GMT. The equivalent French price for Wednesday gained 3.3% to 15.25 euros/MWh. Electricity generation from German wind turbines is forecast to fall by 710 megawatts (MW) on Wednesday to 5.8 gigawatts (GW), Refinitiv Eikon data showed. French wind power is expected to decline by 1 GW to 1.1 GW on Wednesday, the data showed. French nuclear power availability fell by 0.8 percentage points to 70.3% of installed capacity, providing additional support to prices. Power consumption in Germany is expected to dip by 450 MW day-on-day Wednesday to hit 64.3 GW, Refinitiv Eikon data showed. In France, demand is expected to slide by 1.1 GW to 42.8 GW.

https://www.reuters.com/article/europe-electricity/europe-power-spot-gains-on-forecast-drop-in-wind-and-nuclear-generation-idUSL8N2BV290

French aircraft carrier heads home early due to possible COVID-19 cases
Tangi Salaün
Reuters, April 8, 2020

France's flagship aircraft carrier the Charles de Gaulle is returning to its home port early after about 40 crew members showed signs of COVID-19 symptoms, the armed forces ministry said on

Wednesday. The personnel were under strict medical observation on board the nuclear-powered carrier, which had most recently been taking part in exercises with northern European navies in the Baltic Sea.

"The first cases showed symptoms recently," the ministry said in a statement. "There are no signs of aggravated cases among the patients." The aircraft carrier would dock in Toulon, southern France, in the next few days, a spokesman for the head of the armed forces told Reuters. It had been due back on April 23. The Charles de Gaulle set sail for the eastern Mediterranean on Jan. 21 to support French military operations against Islamist militants in Iraq and Syria, before deploying to the Atlantic and then the Baltic.

https://www.reuters.com/article/us-health-coronavirus-france-military/french-aircraft-carrier-heads-home-early-due-to-possible-covid-19-cases-idUSKBN21Q0SY

Bulgaria shuts nuclear reactor for annual maintenance
Reuters, April 8, 2020

Bulgaria's only nuclear plant, Kozloduy, has shut one of its two 1,000-megawatt reactors for planned annual maintenance, it said on Saturday. It said the reactor, Unit 5, will be reconnected to the national grid in the second half of May once it is refuelled and equipment repaired and upgraded. The other Soviet-made 1,000-megawatt unit at the plant on the Danube was working at full capacity, the operator said in a statement.

https://www.reuters.com/article/us-bulgaria-nuclearpower-kozloduy/bulgaria-shuts-nuclear-reactor-for-annual-maintenance-idUSKCN21T07V

French utility EDF withdraws financial targets for 2020 and 2021
Richard Lough, Bate Felix
Reuters, April 14, 2020

French state-controlled utility EDF withdrew its financial targets for 2020 and 2021 on Tuesday as the economic turmoil caused by the coronavirus pandemic impacted key areas of its business. EDF said it was pulling all financial targets, including the lower end of its core earnings (EBITDA) forecast range of 17.5 billion euros ($19 billion) in 2020. "The economic turmoil that follows from the current sanitary crisis results in a drop in power demand and significantly impacts many of the group's businesses, namely nuclear generation ... (and) new-build projects and services," EDF said in a statement.

The company had said on March 23 it would lower its 2020 nuclear power production target of 375 to 390 terawatt hours (TWh) of nuclear production in France, but has not given a precise figure. EDF operates France's 58 nuclear reactors that account for about 75% of the country's electricity needs. The sharp downturn in economic activity meant forecasts for nuclear generation were under review and would be adjusted significantly below the initial assumption, the group said. EDF's nuclear generation in France tumbled 13.8% to 30.6 terawatt hours (TWh) in March compared with the same month a year ago, while output since the start of the year was down 9.5% at 101.2 TWh. Grid operator RTE said on April 8 that electricity consumption in France was down by between 15% and 20% due to confinement measures put in place by the government. RTE said that while the situation remained uncertain, the main effect of the reduced economic activity, coupled with the duration of outages at EDF's reactors, would be felt in the medium term and over several months.

https://www.reuters.com/article/us-edf-targets/french-utility-edf-withdraws-financial-targets-for-2020-and-2021-idUSKCN21W0N6

Russia

Four nuclear workers test positive for coronavirus as Rosatom steps up pandemic response
Charles Digges
Bellona, April 1, 2020

Four Russian nuclear workers have tested positive for the coronavirus and the staff of a nuclear power plant has been put into isolation while state nuclear corporation Rosatom implements a raft of measures to protect employees of its sprawling domestic and international apparatus. As Moscow – and the rest of the world – institutes lockdowns for its citizens, Rostom says it is erring on the side of caution to protect its highly skilled workers against an international pandemic that has infected some 877,000 people around the planet. As of March 31, Russia claims 2,337 of those cases.

On Wednesday, the corporation announced on its website that "as of today, we have four confirmed cases of the illness" Covid-19, the malady caused by the coronavirus. On Saturday, technicians at the Beloyarsk nuclear power plant, 1,800 kilometers east of Moscow, were put into isolation at a local clinic after the wife of one of the plant's employees was hospitalized with symptoms of covid-19, the official Tass news agency reported. According to an account in Komsomolskaya Pravda newspaper, the family's daughter had returned from the United States on March 16, apparently infected with the coronavirus, but asymptomatic.

https://bellona.org/news/nuclear-issues/2020-04-some-russian-nuclear-workers-isolated-as-rosatom-steps-up-coronavirus-response

Russia drafts strategy for low-carbon development
World Nuclear News, April 1, 2020

Russia's Ministry for Economic Development last week published a draft strategy for low-carbon development to 2050. The strategy's basic scenario would see nuclear output grow from 203 TWh in 2017 to 225 TWh in 2030 and 260 TWh in 2050. The ministry said the strategy, which is open to comments until 10 April, is aimed at ensuring the country's transition to a trajectory of diversified economic development characterised by low levels of greenhouse gas emissions. According to Reuters, Deputy Minister of Economic Development Mikhail Rasstrigin said the document is the first comprehensive attempt of the federal government to do this. "Importantly, it sets specific goals for the key areas where the bulk of energy efficiency effects could be reaped," he said. Those areas are: industry, buildings, energy generation and transport. The draft strategy focuses on two main scenarios for low-carbon development: a "basic" scenario and an "intensive" scenario.

Under the basic scenario - which the strategy deems to be the most feasible - the carbon intensity of Russia's GDP will reduce by 9% by 2030 and 48% by 2050 (relative to current levels). Target greenhouse gas emissions in 2030, although higher than today, would be lower than 1990 emissions by one third. This would be achieved through measures including large-scale increases in energy efficiency, the introduction of a carbon price, the development of nuclear and renewable energy, reductions in clear-cutting of forests and an expansion of protect forest areas.

https://www.world-nuclear-news.org/Articles/Russia-drafts-strategy-for-low-carbon-development

BN-600 licensed to operate until 2025
World Nuclear News, April 1, 2020

Russian nuclear regulator Rostekhnadzor has extended the operating licence for unit 3 of the Beloyarsk nuclear power plant in the Sverdlovsk district by a further five years. The licence for the BN-600 fast reactor, which began operating in 1981, was due to expire this year. A large-scale modernisation programme has been under way at the unit since 2009, which has affected all areas of safety, operator Rosenergoatom said. This has included the installation of a second reactor emergency protection system, an emergency dampening system using an air heat exchanger and a back-up reactor control panel.

In addition, a large amount of work has been carried out on the inspection and replacement of equipment, including the replacement of the unit's steam generators. In 2010, the BN-600 was confirmed to be in compliance with the latest safety requirements and on that basis extension of the operating life was justified until 2025. However, Rostekhnadzor only extended its license for a further 10 years of operation, requesting additional justification for the operability of irreplaceable reactor components.

https://www.world-nuclear-news.org/Articles/BN-600-licensed-to-operate-until-2025

Space Research Institute to develop flight sample of lunar geological exploration probe
TASS News Agency, April 3, 2020

The Russian Academy of Sciences' Space Research Institute has held tests of an experimental sample of a gamma-and-neutron spectrometer for geological exploration of the Moon from the orbit and is about to start creating a flight sample, the chief of the institute's nuclear planetology department, Igor Mitrofanov, has told TASS. "We are through with the development, creation and testing of technological samples. Now we are about to proceed with the main phase — the creation of flight samples," Mitrofanov said.

The date when the flight sample may be delivered remains unclear. Earlier, Mitrofanov told TASS that the instrument installed on the Luna-26 orbiter will allow for scanning nearly the entire surface of the Moon. The instrument will measure the gamma radiation and flow of neutrons. On the basis of the accrued gamma radiation a general averaged map will be created that will allow for determining the composition and amount of volatile compounds on the Moon.

https://tass.com/science/1139799

Russia's nuclear workers isolated onsite as coronavirus spreads
Charles Digges
Bellona, April 3, 2020

Workers at Russia's nuclear power plants will be isolated from the general public and required to live in onsite clinics at their respective stations as nuclear authorities tighten their response to the coronavirus after a number of industry infections. The order came Tuesday from Rosenergoatom, Russia's nuclear utility, and specified that both primary and back up crews of nuclear technicians, who "facilitate process continuity" would now be required check in to dispensaries at their plants, where they would be provided with daily living essentials and isolated from outside contact.

Rosenergoatom, which is a subsidiary of state nuclear corporation Rosatom, is responding to a Tuesday video address by Andrei Likhachev, the corporation's CEO, which outlined the isolation measures. Earlier this week, Likhachev confirmed that four Rosatom employees had tested positive for the coronavirus, the spread of which has all but ground the world economy to a halt as the number of those infected worldwide surpasses 1 million.
https://bellona.org/news/nuclear-issues/2020-04-russias-nuclear-workers-isolated-onsite-as-coronavirus-spreads

Russia's NCCP to supply Egyptian research reactor
World Nuclear News, April 6, 2020

Oleg Grigoriyev, TVEL's senior vice president for commerce and international business, said the latest contract was a "logical follow-up" to a number of contracts for shipments of fuel components to Egypt fulfilled by NCCP over the last three years. ETRR-2 - located in Inshas, 60 km north-west of Cairo - is an Argentinian-designed 22 MWt research reactor that started up in 1997. According to INVAP, the Argentinian state-owned applied research company that supplied and built the reactor, it is an open pool reactor which uses fuel made of 19.75% enriched uranium alloy. The multipurpose reactor is used for radioisotope production and research on neutron physics, materials science, nuclear fuel and boron neutron capture therapy.

Egypt plans to build four Russian-designed VVER-1200 reactors at El Dabaa for electricity generation and water desalination. Egypt's Nuclear Power Plants Authority last year received a site approval permit for El Dabaa, which is on the Mediterranean coast, from the Egyptian Nuclear Regulation and Radiological Authority. TVEL said it will supply fuel to all four units for the entire operation of the plant, under a fuel contract that came into force in 2017. TVEL's Central Design and Technological Institute subsidiary has been subcontracted for a project to construct the storage facility for used nuclear fuel from the plant.

https://www.world-nuclear-news.org/Articles/Russian-facility-to-supply-fuel-components-for-Egy

Chernobyl Exclusion Zone Area Sees Spike In Radiation 16 Times Higher Than Normal After Forest Fire
Aristos Georgiou
Newsweek, April 6, 2020

A forest fire which broke out in the exclusion zone around Chernobyl over the weekend caused a spike in radiation levels, according to authorities. The blaze, which ignited on Saturday close to the power plant, quickly spread to cover more than 20 hectares, Ukraine's civil protection agency said. Authorities dispatched around 90 firefighters, two water-carrying planes and a helicopter to battle the blaze on Saturday. By Sunday morning the fire was not visibly burning, according to the emergencies service. In addition, there was no further increase of radiation levels in the air.

https://www.newsweek.com/chernobyl-exclusion-zone-area-spike-radiation-16-times-higher-normal-forest-fire-1496287

Rosatom chief hopes for business-as-usual before May
World Nuclear News, April 7, 2020

Rosatom plans to resume normal working by the end of this month and sees no need to change the schedule of its new-build projects overseas, Director General Alexey Likhachov said in a video-address to the state nuclear corporation's employees. The video was part of the latest edition of the company's in-house publication Strana Rosatom, which was published on 4 April.
Referring to Russian President Vladimir Putin's extension of a nationwide paid holiday until the end of April in response to the COVID-19 pandemic, Likhachov said: "If the epidemiological situation in the regions allows, then we plan to enter the usual mode of activity before the end of April. But I would stress that this decision should be taken individually at each enterprise and in close cooperation with the regional authorities and sanitary and epidemiological monitoring authorities." "Projects abroad will go as planned," he added. "Although we don't see additional serious risk of needing to change the schedules of our construction projects this year, we can't predict how the situation in a particular country will develop."

https://www.world-nuclear-news.org/Articles/Rosatom-chief-hopes-for-business-as-usual-by-month

Area of Chernobyl wildfire triples in size
TASS News Agency, April 7, 2020
The wildfire area near the Chernobyl Nuclear Power Plant has more than tripled to 35 hectares, the State Emergency Service of Ukraine reported Tuesday. Earlier in the morning, the service disclosed that the wildfire area was only 10.5 hectares.

Two Mi-8 helicopters and one An-32P plane have been involved in extinguishing the blaze. Seventy-two tonnes of water have already been dropped on the fire. Additional Emergency Service troops from Ukraine's Zhitomir Region were sent to the site, the service says. According to the agency, the radiation background in Kiev and the Kiev Region "is within the norm and does not exceed natural background levels."

https://tass.com/world/1141299

Nuclear corporation Rosatom evacuates 178 employees from Bangladesh amid coronavirus
TASS News Agency, April 7, 2020

Russia's state-run nuclear corporation Rosatom evacuated 178 of its employees involved in a project to build the Rooppur nuclear power plant in Bangladesh amid the novel coronavirus outbreak, Rosatom chief Alexei Likhachev said. "We bear responsibility for our staff. So, if our people, who are abroad, are willing to return amid the current difficult circumstances, we are ready to meet their request. With the permission from the Russian government, we organized the first flight of this kind today, bringing 178 people to Russia from Bangladesh upon their request," he said.

The majority of those who arrived to Russia on April 6 are employees of the corporation's engineering division, headquartered in the Central Russian city of Nizhny Novgorod. According to the regional administration, all of them will be quarantined for two weeks. In his address to the company earlier this week, Likhachev promised that every employee involved in the company's overseas projects will have an opportunity to return back to Russia amid the current pandemic of COVID-19.

https://tass.com/world/1141021

Questions on New START extension should go to Washington — Kremlin
TASS News Agency, April 8, 2020

The US actions stall the extension of the New START Treaty, Kremlin spokesman, Dmitry Peskov told journalists Wednesday. When asked whether the treaty has chances for extension, the spokesman said that this question should go to the US.

He added that the treaty is the only remaining arms control document, and thus is important for the entire planet. "You know that actions on destruction of this document, on its non-extension, are taken not by Moscow; rather, this is our US colleagues' unwillingness, and we have repeatedly expressed our regret in that regard," Peskov underscored.

https://tass.com/politics/1141743

No press, no family: Space crew set for launch during pandemic
The Hindu, April 8, 2020

A three-man space crew finished preparations on Wednesday for a mission to the International Space Station (ISS), which is going ahead despite the coronavirus pandemic. Anatoly Ivanishin and Ivan Vagner of Russia's Roscosmos space agency and NASA's Chris Cassidy will blast off from Kazakhstan for a six-month mission at 08:05 GMT (1:35 pm IST) on Thursday. But with journalists and relatives unable to travel to Baikonur due to restrictions related to COVID-19, the traditional farewell press conference broadcast by Roscosmos had a more distant and sombre feel.

https://www.thehindu.com/sci-tech/science/no-press-no-family-space-crew-set-for-launch-during-pandemic/article31288803.ece

Rosatom uses new inspection device at Kalinin unit 1
World Nuclear News, April 8, 2020

Rosatom has for the first time used a new device that it says performs all types of non-destructive testing automatically and without the use of a polar crane and a reloading machine. The Kalinin plant is just over 200 miles north-west of Moscow, in the Tver region of Russia. The "modular delivery manipulator", guided by a television monitoring system, was employed at unit 1 of the Kalinin nuclear power plant to inspect the reactor vessel and internal components.

Maksim Milyaev, deputy head of the plant's central repair shop, said the device enables vertical and horizontal movement of its camera, as well as its full rotation. "The capabilities of the manipulator can significantly simplify the control procedure, reducing the [radiation] dose to operating personnel," Milyaev said. "Its main advantage is the speed of surface scanning and the exclusion of camera relocation operations, which allows for a reduction in the repair time of the power unit and a reduction in cost of up to RUB65 million [USD860,000] per year," he added.

https://www.world-nuclear-news.org/Articles/Rosatom-uses-new-inspection-device-at-Kalinin-unit

Nuclear corporation Rosatom subcontractors' staff isolated in Belarus over coronavirus
TASS News Agency, April 8, 2020

Fifteen specialists of Rosatom's three subcontractors working at the Belarusian NPP construction site have been hospitalized after testing positive for the coronavirus, the Russian nuclear energy corporation said in statement. "The grounds for their isolation were positive tests for COVID-19, which the staff took upon their arrival in Belarus. At the moment, a range of individuals, who had

contacted with these staff, have been identified. They have been also isolated and tested for the coronavirus, and the results are expected soon," the statement reads. Rosatom notes that all the necessary measures have been taken at the Belarusian NPP construction site to prevent the spread of the coronavirus. All specialists arriving at the construction site are required to undergo tests for the infection.

https://tass.com/society/1141825

Rosatom evacuates some employees from Bangladesh nuclear site
Nuclear Engineering, April 8, 2020

Russia's state nuclear corporation Rosatom has repatriated 178 employees from the Rooppur nuclear power plant construction site in Bangladesh. Rosatom had to obtain government permission to evacuate its employees. Russia temporarily suspended all international flights on 3 April in an effort to prevent the spread of the coronavirus. The first 178 employees arrived on a flight from Dhaka, which landed at the Nizhny Novgorod international airport in Russia on Monday. Almost all of the workers were from Rosatom's Engineering Division or were subcontractors working at the Rooppur site, where Rosatom is building two VVER-1200 reactors.

Rosatom said passengers on the flight would be tested for Covid-19, and will need to spend two weeks in isolation, under medical supervision. More than 4000 people are involved in the construction of Rooppur NPP, so the temporary relocation of 178 employees will not affect the project schedule, Rosatom said. Rosatom said it is taking steps to combat the spread of Covid-19 by monitoring employee temperatures at various locations on-site, issuing masks to workers and increasing disinfection of all office space. Rooppur 1 is currently scheduled to start operating 2023, followed by Rooppur 2 a year later.

https://www.neimagazine.com/news/newsrosatom-evaucates-some-employees-from-bangladesh-nuclear-site-7864853

Russia urges US to promptly prolong New START
TASS News Agency, April 8, 2020

Russia is urging the United States to make a prompt and positive response to the proposal for prolonging the Measures for the Further Reduction and Limitation of Strategic Offensive Arms (New START), the Russian Foreign Ministry said in a statement on the occasion of the treaty's tenth anniversary. "In accordance with Russian President Vladimir Putin's initiative an official proposal was made to the American side back in December 2019 for prolonging the New START without any preconditions and for getting down to work on practical issues related with this.

We hope for a prompt and positive response from the United States," the Foreign Ministry said.
The role and importance of the treaty are growing considerably in the current no easy international relations, because "in fact the treaty has remained the sole control and limitation mechanism" regarding Moscow's and Washington's strategic weapons, the statement runs. "We believe that it is necessary to preserve this well-tested mechanism and ensure its proper viability. We are certain that this would meet the interests of Russia, the United States and the entire international community, guarantee the predictability of the situation in the nuclear missile sphere and help maintain strategic stability," the Foreign Ministry stressed.

https://tass.com/politics/1141833

Russian scientists find Novovoronezh Nuclear Power Plant suitable for unique experiment
TASS News Agency, April 9, 2020

The sixth block of the Novovoronezh Nuclear Power Plant might become a venue for a number of experiments for the study of one of the most difficult particles to register — the neutrino, says Rosatom's electric power division, Rosenergoatom, citing specialists from the Joint Institute for Nuclear Research in Russia's Dubna. Research into neutrino properties is of high interest for fundamental physics, as it will provide insight into the design of the Universe. Besides, research of the neutrino is important for nuclear physics. In the future, these particles might become useful for remote monitoring of nuclear reactors' operation.

"During our research we have discovered that one of the [NPP's] rooms has very favorable conditions of low background for neutrino properties research, one of the best conditions in the world. The materials that the reactor is built of provide good protection from the space radiation. We have discovered no effect of the nuclear reactor on the radiation level. The space muon flow is seven times lower that on the surface, the flow of thermal neutrons is 33 times lower, and the flow of fast neutrons is 25 times lower than in a normal laboratory room outside the plant," says Alexei Lubashevsky, senior researcher from the Dubna Institute.

https://tass.com/science/1142455

Framatome to deliver reactor protection system for Kursk II
Nuclear Engineering, April 9, 2020

Framatome has won a contract to deliver the reactor protection system for two VVER-TOI units under construction at the Kursk II nuclear power plant in Russia. The contract includes planning, design, manufacture and implementation of the reactor protection system at units 1&2 of the Kursk II nuclear plant. The reactor protection system consists of 45 TELEPERM XS I&C cabinets qualified in the highest safety class, Framatome said. The contract follows the successful implementation of Framatome's TELEPERM XS digital I&C platform at other nuclear plants in Russia, including Novovoronezh II-1 and Leningrad II-1.

It also builds on the 2018 memorandum of understanding Framatome signed with Rusatom Automated Control Systems (RASU), part of Russian state nuclear corporation Rosatom. RASU is responsible for the overall I&C development, supply and commissioning for the first two units at Kursk II. Framatome said it will deliver I&C cabinets to RASU's integration centre in Moscow. It will also provide supervisory services in the test bay and during installation (scheduled for completion at the end of 2025) and commissioning. Framatome is owned by the EDF Group (75.5%), Mitsubishi Heavy Industries (19.5%) and Assystem (5%). Construction on the first unit at Kursk II began in April 2018, followed by the second unit in April 2019. The reactors, each with a capacity of 1200MW, will replace the existing power units at the Kursk nuclear power plant.

https://www.neimagazine.com/news/newsframatome-to-deliver-reactor-protection-system-for-kursk-ii-7865990

Advanced nuclear-powered sub Knyaz Vladimir to be delivered to Russian Navy by late June
TASS News Agency, April 13, 2020

The Project 955A (Borei-A) lead nuclear-powered submarine Knyaz Vladimir will be delivered to the Russian Navy by late June and the vessel will undergo at least one sea trial before that date, a source in the Russian defense industry told TASS. "The Project 955A lead nuclear-powered submarine is planned to be delivered to the Russian Navy before the end of the first half of the year, i.e. before the end of June," the source said. "Before that time the vessel will certainly undergo at least one more sea trial, perhaps even two or three more sea trials."

The source added that the additional sea trials were necessary "to check the operability of the vessel's all units and systems following the work on the elimination of shortcomings, which were detected during the trials in 2019." The Knyaz Vladimir is the improved Project 955A strategic missile-carrying underwater cruiser, which represents the fourth generation of nuclear-powered subs built for the Russian Navy. It was floated out in November 2017. According to the data of Russia's Defense Ministry, the sub Knyaz Vladimir is less noisy and features improved maneuvering, depth and armament control systems.

https://tass.com/defense/1143771

Russia open for talks with US on hypersonic weapons — top diplomat
TASS News Agency, April 14, 2020

Moscow is open for a dialogue with Washington on new advanced developments, including hypersonic weapons, Russian Foreign Minister Sergey Lavrov said in an online interview with Russian and foreign media on Tuesday.

"We are also open for a talk on new advanced developments, including hypersonic weapons, in the context, and I want to emphasize it, of all the aspects and all the factors that influence strategic stability," Lavrov said. This talk should cover the plans of deploying weapons in outer space, strategic conventional armaments, the future of the Comprehensive Nuclear-Test-Ban Treaty and other issues, the Russian foreign minister explained.

https://tass.com/politics/1144535

Press review: Russia, US to restart arms control talks and OPEC+ deal impotent on prices
TASS News Agency, April 15, 2020

Moscow and Washington intend to restart work on strategic stability issues, Russian Foreign Minister Sergey Lavrov stated on April 14, Vedomosti writes. According to Lavrov, US Secretary of State Mike Pompeo touched upon the possibility of resuming arms control talks in a recent phone call. The Russian top diplomat pointed out that Moscow welcomed Washington's interest in this topic but would like to hold "more specific discussions, particularly in relation to the Strategic Arms Reduction Treaty (New START)." According to a source close to the Russian Defense Ministry, there is little hope that the United States will reconsider its position on New START. Washington will definitely continue to insist on bringing China into the treaty, which Beijing sees as unacceptable.

Washington pointed to China to justify its withdrawal from the Intermediate-Range Nuclear Forces Treaty, and the US administration has, on the whole, come to the conclusion that there is no sense in bilateral talks of this kind, Editor-in-Chief of the Russia in Global Affairs magazine Fyodor Lukyanov pointed out. "The position is clear, one can reject it and believe it is wrong but it has its own logic. And this logic says that New START cannot be extended," Lukyanov concluded.

Engaging more countries will mean that the treaty will have to be nullified and a new document will need to be drawn up, the expert explained. "Why should the Americans abandon this idea when their standoff with China is heating up?" he noted.

https://tass.com/pressreview/1144941

Fire near Chernobyl Plant does not affect background radiation in Russia
TASS News Agency, April 15, 2020

The fire outbreak near the Chernobyl Nuclear Plant in Ukraine has not influenced background radiation in Russia, with air masses from the fire scene moving eastward and southeastward, the press service of the Russian weather service Rosgidromet reports. "Monitoring posts operating as part of the Rosgidromet monitoring system did not register changes in the radiation situation on the territory in Russia over the last day," the press service said.

According to data of the Russian weather services, air masses from the fire scene will migrate eastward and southeastward on April 15-18. The fire near the Chernobyl Plant started on April 4. Twelve villages, whose residents were evacuated after the plant accident in 1986, burnt down over that period. The fire started fading after rains that started on Monday evening. The Ukraine's Emercom said on Tuesday that the fire was extinguished in the exclusion zone but smoldering would take several days to stop completely.

https://tass.com/emergencies/1145399

West Asia
Iran

Rouhani: U.S. has lost opportunity to lift Iran sanctions amid coronavirus
Parisa Hafezi
Reuters, April 1, 2020

Iran's president said on Wednesday that, with the advent of the coronavirus, the United States had missed a historic opportunity to lift sanctions on his country, though the penalties had not hampered its fight against the infection. U.S Secretary of State Mike Pompeo raised the possibility that Washington might consider easing sanctions on Iran and other nations to help fight the epidemic, but gave no concrete sign it plans to do so. "The United States lost the best opportunity to lift sanctions," Hassan Rouhani said in a televised cabinet meeting. "It was a great opportunity for Americans to apologize ... and to lift the unjust and unfair sanctions on Iran."

https://www.reuters.com/article/us-iran-usa-sanctions/rouhani-u-s-has-lost-opportunity-to-lift-iran-sanctions-amid-coronavirus-idUSKBN21J4HW

Macron calls on Iran to respect nuclear obligations: Elysee
Reuters, April 7, 2020

French President Emmanuel Macron called on Iran to respect its nuclear obligations in a conversation with President Hassan Rohani, adding that this was the moment when the international community must come together to fight the coronavirus. "He (Macron) hoped that Iran would turn to the respect

of its nuclear obligations, refrain from taking new measures contrary to the Joint Comprehensive Plan of Action (JCPOA) and contribute to the easing of regional tensions," Elysee said in a statement.

https://www.reuters.com/article/us-france-iran-macron/macron-calls-on-iran-to-respect-nuclear-obligations-elysee-idUSKBN21O30V

East Asia
Japan

Japan's 2018/19 greenhouse emissions fall 3.9% to record low
Reuters, April 14, 2020

Japan's greenhouse gas emissions fell 3.9% to a record low in the year ended March 2019, government figures showed on Tuesday, thanks to wider use of renewable energy, the gradual return of nuclear power and lower energy demand due to warmer winter. The annual drop was the fifth straight and contrasts with a surge in global greenhouse emissions to a record last year. Emissions in financial year 2018/19 dropped to 1.240 billion metric tonnes of CO2 equivalent from 1.291 billion tonnes the previous year, to hit their lowest since 1990/91, when Japan began compiling data on greenhouse gas emissions, revised data from the environment ministry shows.

Japan, the world's fifth-biggest carbon emitter, has set a goal to trim emissions by 26% from 2013 levels to 1.042 billion tonnes by 2030. The latest figure represents a reduction of 12.0% from the 2013/14 levels, data showed. The nation's emissions had surged after the 2011 nuclear disaster at Fukushima led to the closure of atomic power plants and boosted reliance on fossil fuels, but have turned lower since a peak of 1.41 billion tonnes hit in 2013/14. Nine reactors have been restarted, the most since the Fukushima disaster caused the shutdown of the sector, although three of the nine are temporarily shut now for maintenance including to upgrades required under stricter anti-terrorism rules. Renewable energy accounted for 17% of electric power generation of 1.051 trillion kilowatt hour (kWh) in the 2018 financial year, up 1 percentage point on the year. Nuclear energy came in at 6%, doubling from a year earlier, while thermal power made up 77%, down 4 percentage points, industry ministry data showed.

https://www.reuters.com/article/us-japan-carbon/japans-2018-19-greenhouse-emissions-fall-3-9-to-record-low-idUSKCN21W097

North Korea

Dummy missile test suspected at NK shipyard: report
Choi Si-young
Korea Herald, April 9, 2020

North Korea may have tested dummy missiles at its Sinpo South Shipyard along its east coast in recent days, Washington-based website 38 North said Wednesday, citing commercial satellite imagery. Four unidentified objects were lined up next to the ejection pad, and the service tower on the pad looked operational, with vehicles lined up next to it, according to 38 North. The imagery suggested Pyongyang tested dummy missiles to assess their reliability, concluded the North Korea analysts who maintain the site.

But the group was unsure whether North Korea had completed the testing or if there were plans for more tests. A day earlier, the US Congressional Research Service said North Korea continued to pose regional security challenges with its nuclear and missile programs. In its latest report, the US Congress think tank called North Korea a rogue regime that sponsors terrorism, carries out outlawed actions and engages in reckless rhetoric despite the UN sanctions it faces.

http://www.koreaherald.com/view.php?ud=20200409000710&ACE_SEARCH=1

North Korea's leadership contingency and nuclear weapons
Lee Sang-hyun
Korea Times, April 13, 2020

There were a series of claims that North Korean leader Kim Jong-un had died or was in critical condition. Numerous theories and speculations surrounding him ended when he finally appeared at the opening ceremony of a Sunchon fertilizer plant on Labor Day, May 1. Although it ended up as a groundless rumor, the incident taught us that we should always be careful about Kim's health. There have always been predictions that his health, as he is seriously obese, could be in trouble. However, the fact that he could collapse at any time due to health problems has become clearer than in the past. What would happen to North Korea if there were unexpected problems with Kim's health? North Korea is a system in which one supreme leader decides everything, and so what would happen if Kim disappeared?

Amid all kinds of speculation and rumors surrounding Kim's future, the second anniversary of the Panmunjeom Declaration passed quietly. Two years have passed since South Korean President Moon Jae-in and Kim held their summit at the truce village of Panmunjeom and adopted the April 27 Declaration, which promised to establish a peace regime on the Korean Peninsula; but the cold air between the two Koreas still remains. Experts say that inter-Korean relations have returned to the pre-declaration level. Denuclearization negotiations between the U.S. and North Korea also stalled as a summit between Donald Trump and Kim in Hanoi in February last year, and the working-level Stockholm negotiations in October, ended without any results.

http://www.koreatimes.co.kr/www/opinion/2020/05/137_289379.html

North Korea test fires multiple short-range anti-ship missiles
Hyonhee Shin, Josh Smith
Reuters, April 14, 2020

North Korea launched multiple short-range anti-ship cruise missiles into the sea and Sukhoi jets fired air-to-surface missiles on Tuesday as part of military exercises, South Korea’s military said. The missile tests were done on the eve of a national holiday in North Korea to celebrate the birthday of Kim Il Sung, the founder of the country and grandfather of the current leader, Kim Jong Un.Launched at around 7 a.m. (2200 GMT), the anti-ship missiles plunged into the sea more than 150 kilometres (93 miles) off the east coast town of Munchon, while the Sukhois carried out firing tests, officials at South Korea’s Joint Chiefs of Staff (JCS) told reporters. The JCS gave no indication of how many missiles were fired, but said a detailed analysis of the launches was being conducted together with U.S. intelligence.

https://www.reuters.com/article/us-northkorea-missiles/north-korea-test-fires-multiple-short-range-anti-ship-missiles-idUSKCN21W0FS

South Korea

Top nuclear envoys of S. Korea, US hold phone talks on peace efforts with NK
Yonhap
Korea Herald, April 2, 2020

The top nuclear envoys of South Korea and the United States held phone talks Thursday over the North Korean nuclear issue and joint efforts for lasting peace on the peninsula, the foreign ministry said. Lee Do-hoon, the ministry's special representative for Korean Peninsula peace and security affairs, and Stephen Biegun, the US special representative for North Korea and deputy secretary of state, spoke over the phone in a show of their continued coordination on peace efforts.

The conversation came amid tensions caused by the North's repeated short-range rocket tests and a protracted stalemate in nuclear negotiations between Washington and Pyongyang. "The two sides shared their assessment of the recent situation on the Korean Peninsula, and discussed ways to cooperate to make substantive progress in the efforts for the complete denuclearization of the peninsula and a lasting peace," the ministry said in a press release. Lee and Biegun also agreed to continue close communication and consultation on North Korea-related issues.

http://www.koreaherald.com/view.php?ud=20200402000537&ACE_SEARCH=1

Top nuke envoys of S. Korea, Japan hold phone talks over NK denuclearization
Yonhap
Korea Herald, April 8 , 2020

The top nuclear envoys of South Korea and Japan held phone talks over the North Korean nuclear issue and security situation on the Korean Peninsula, the foreign ministry said. The conversation between Lee Do-hoon and his Japanese counterpart, Shigeki Takizaki, came amid concerns that the global fight against the new coronavirus could overshadow the efforts to denuclearize North Korea and lay the groundwork for lasting peace on the peninsula. "The two sides agreed to continue close communication and cooperation between South Korea and Japan, and among South Korea, the United States and Japan, over the North Korean nuclear and other issues, in the midst of active efforts to stem the spread of COVID-19 that has been spreading across the world," the ministry said in a press release.

Observers said that Lee and Takizaki might have exchanged views on Pyongyang's plan to convene a session of the Supreme People's Assembly, the country's rubber-stamp parliament, on Friday, and a recent series of its rocket launches. Lee also held a phone meeting with Stephen Biegun, the US special representative for North Korea and deputy secretary of state, in a show of their continued coordination on peace efforts.

http://www.koreaherald.com/view.php?ud=20200408000693&ACE_SEARCH=1

Doosan Group likely to sell off affiliate as part of self-rescue plan
Yonhap
Korea Herald, April 13, 2020

The cash-strapped South Korean conglomerate Doosan Group announced it has submitted a self-rescue plan to its creditors, apparently including selling of an affiliate and pay cuts for executives. Doosan Group has been struggling to normalize troubled affiliate Doosan Heavy Industries &

Construction Co. Last month, Doosan Heavy opened a 1 trillion-won ($821 million) credit line from South Korea's state lenders -- Korea Development Bank and Korea Export-Import Bank -- to prevent a liquidity crunch. In a press release, Doosan Group said it was exploring opportunities to sell off assets "in order to ensure normalization of Doosan Heavy and swift improvement of our financial structure." Industry sources said the group's plan includes dumping its 61-percent stake in Doosan Solus, which makes and distributes copper products.

Earlier this month, Doosan Group Chairman Park Jeong-won and other executives offered to take salary reductions of up to 50 percent, and these pay cuts were likely included in the self-rescue plan. Doosan Heavy's net losses deepened in recent years as South Korea has sought to boost the supply of power from clean and renewable energy sources while weaning the country off nuclear and coal-fired plants. Doosan Heavy suffered accumulated net losses of 2.68 trillion won from 2014 through 2019. Doosan Heavy said orders worth about 10 trillion won have dried up due to the cancellation of nuclear and coal-fired plant projects in South Korea. South Korea, which decommissioned two nuclear power plants in 2017 and 2019, is set to retire 10 out of its total 24 reactors on its soil by the end of 2030.

http://www.koreaherald.com/view.php?ud=20200413000924&ACE_SEARCH=1

Misc/World

Nuclear industry's response to Covid-19 outbreak

Power Technology, April 1, 2020

The novel coronavirus (Covid-19) crisis has led to a slowdown of the economic growth of countries across the world. The global pandemic has called for considerable measures to be taken in every aspect of life worldwide. The coronavirus spread has affected numerous industries and the global economy. One such industry is the power sector, which has witnessed a visible impact in the last two months. The electricity demand curve has taken a new shape in the affected regions. During this ongoing Covid-19 crisis, apart from fossil fuel and renewable power technologies, nuclear reactors are also playing a crucial role in a number of countries in maintaining electricity supplies. Nuclear technology is a major baseload power-generating source and accounted for 10.3% of global power generation in 2019. The nuclear power sector is growing in many countries as demand for electricity increases. Some 31 countries are currently operating nuclear reactors for their electricity generation. Countries with significant nuclear power capacity are: the US, France, Japan, China, Russian Federation, Republic of Korea, Canada, and Ukraine, with more than 10 gigawatts (GW) of cumulative installed capacity each. Germany, the UK, Sweden, Spain, India, and Belgium have 5GW-10GW cumulative installed nuclear power capacity each.

Climate change concerns have also raised awareness of the need to reduce the use of fossil fuels in favour of low-emission power sources. Nuclear power is the readily available large-scale alternative to fossil fuels for the production of a continuous and reliable supply of electricity for meeting base-load demand. Nuclear reactors also involve high capacity factors, offering increased reliability, constant supply compared to intermittent renewable sources, such as wind and solar.

https://www.power-technology.com/comment/nuclear-industry-covid-19/

IAEA dispatches COVID-19 detection equipment

World Nuclear News, April 2, 2020

The International Atomic Energy Agency (IAEA) is dispatching a first batch of equipment to more than 40 countries to enable them to use a nuclear-derived technique to rapidly detect the coronavirus that causes COVID-19. This emergency assistance is part of the IAEA's response to requests for support from around 90 Member States in controlling an increasing number of infections worldwide.

Dozens of laboratories in Africa, Asia, Europe, Latin America and the Caribbean will receive diagnostic machines and kits, reagents and laboratory consumables to speed up national testing, which is crucial in containing the outbreak. They will also receive biosafety supplies, such as personal protection equipment and laboratory cabinets for the safe analysis of collected samples. Further deliveries of equipment to the growing number of countries seeking assistance are expected in the coming weeks.

https://www.world-nuclear-news.org/Articles/IAEA-dispatches-COVID-19-detection-equipment

U.N. nuclear agency sending coronavirus testing gear to 40 countries

Reuters, April 2, 2020

The U.N. atomic agency is sending an initial batch of equipment to about 40 countries with which they will be able to perform a standard test for the coronavirus involving a technique derived from nuclear science, it said on Wednesday. The International Atomic Energy Agency is known for its nuclear inspection work in countries like Iran but it also has a mandate to help countries use nuclear technology for peaceful purposes. It has received requests for assistance with coronavirus testing from 90 member states.

The initial batch is part of a wider effort funded from the IAEA's budget and extra contributions from member states including $6 million from the United States, which has come under fire for its own deployment of testing, and 5 million Canadian dollars ($3.52 million) from Ottawa. "Dozens of laboratories in Africa, Asia, Europe, Latin America and the Caribbean will receive diagnostic machines and kits, reagents and laboratory consumables to speed up national testing, which is crucial in containing the outbreak," the IAEA said in a statement. "They will also receive biosafety supplies, such as personal protection equipment and laboratory cabinets for the safe analysis of collected samples."

The pandemic has overwhelmed medical systems in some of the world's most advanced countries, and testing is key to measuring, locating and containing outbreaks. That has raised fears the toll in the developing world will be even worse. Iran, Egypt, Kenya, Nigeria, Thailand, Vietnam, Cuba, Peru and Uruguay are among the larger and more technologically advanced countries that will receive the first batch of equipment, worth around 4 million euros ($4.37 million). Recipients in Latin America include Venezuela, Colombia, Ecuador, Guatemala, Honduras and Paraguay. In Asia, Cambodia, Laos, Malaysia, Mongolia, Myanmar, Nepal, the Philippines and Sri Lanka are among them. "IAEA staff are working hard to ensure that this critical equipment is delivered as quickly as possible where it is most needed," IAEA chief Rafael Grossi said.

https://www.reuters.com/article/us-health-coronavirus-testing-aid/u-n-nuclear-agency-sending-coronavirus-testing-gear-to-40-countries-idUSKBN21J6UR

Brazil's Angra plant receives first fuel store modules

World Nuclear News, April 6, 2020

Holtec International delivered the first five of 15 modules for an on-site used fuel dry storage facility to Brazil's Angra nuclear power plant last week. The new storage facility, set to be commissioned at the end of this year, will create space in the almost full storage pools of units 1 and 2, allowing their continued operation.

Under a turnkey contract signed in 2017, Holtec of the USA is supplying Brazilian nuclear operator Eletronuclear with HI-STORM FW systems and related equipment for dry storage of used fuel from Angra 1 and 2. Angra 1 is a Westinghouse-designed 609 MWe pressurised water reactor, while Angra 2 is a Siemens-designed 1275 MWe PWR. The units have different architectures and licensing bases, adding to the complexity of the project. Holtec is modifying their respective cask handling cranes and equipment for loading the fuel into the multi-purpose canisters and for moving the canisters to the dry storage facility.

https://www.world-nuclear-news.org/Articles/Brazilian-used-fuel-store-set-for-year-end-complet

As Africa looks for clean power, nuclear interest grows

Farai Shawn Matiashe
Reuters, April 10, 2020

Faced with power shortfalls, demands for greener energy and drought threats to hydropower, a growing range of African nations are considering a shift to an unexpected power source - nuclear energy. South Africa has the continent's only commercial nuclear power plant. But according to the International Atomic Energy Agency (IAEA), a third of the almost 30 countries around the world considering adopting nuclear power are in Africa. Ghana, Kenya, Egypt, Morocco, Niger, Nigeria and Sudan have engaged with the IAEA to assess their readiness to embark on a nuclear programme, and Algeria, Tunisia, Uganda and Zambia are mulling the possibility, according to the agency. Altogether, at least seven sub-Saharan African states have signed agreements to deploy nuclear power with backing from Russia, according to public announcements and the World Nuclear Association (WNA), an industry body. "Africa is embracing nuclear science in general," said Colin Namalambo, a commissioner of the African Commission on Nuclear Energy, in an interview with the Thomson Reuters Foundation during a recent meeting in Accra on nuclear power opportunities.

That growing interest comes despite evidence that solar and wind might be a cheaper and greener way to expand electricity production in Africa, where one person in three still lacks access, most of them in rural areas. Benson Kibiti, director of communications for Power for All, which aims over the next decade to get reliable energy to most of the 1.1 billion people globally without it, said off-grid solar is the smartest economic choice for Africa. "While I agree that the continent is in dire need of energy, with 600 million people still living without access to electricity, it takes 10 years and billions of dollars to commission a nuclear power station," he said in an email. That makes nuclear power a "prohibitively expensive" choice, he said, arguing that "off-grid solar is and should be Africa's energy future".

https://www.reuters.com/article/us-africa-nuclearpower-climate-change-tr/as-africa-looks-for-clean-power-nuclear-interest-grows-idUSKCN21S03U

What Could be Nuclear Reactor Market Biggest Opportunity and Challenges Post 2020 Crisis?

Open PR, April 14, 2020

The latest 119+ page survey report on Global Nuclear Reactor Market is released by HTF MI covering various players of the industry selected from global geographies like North America Country (United States, Canada), South America, Asia Country (China, Japan, India, Korea), Europe Country (Germany, UK, France, Italy) & Other Country (Middle East, Africa, GCC). A perfect mix of quantitative & qualitative Market information highlighting developments, industry challenges that competitors are facing along with gaps and opportunity available and would trend in Nuclear Reactor market. The study bridges the historical data from 2014 to 2019 and estimated till 2025*. Some are the key & emerging players that are part of coverage and were profiled in current version are Areva, CNNC, Rosatom, Westinghouse Electric Company, CGN, Hitachi GE Nuclear Energy, Mitsubishi Heavy Industries & KHNP.

https://www.openpr.com/news/2009999/what-could-be-nuclear-reactor-market-biggest-opportunity

Uzbekistan invites bids for 100 megawatt wind farm project
Reuters, April 15, 2020

Uzbekistan's energy ministry on Wednesday issued a request for proposals on a 100 megawatt wind farm project that it said would be the first in the Central Asian nation. The ministry said the wind farm would be built in the steppes of Karakalpakstan autonomous republic located in the westernmost part of the former Soviet country of 34 million. It did not say how much the project backed by the European Bank for Reconstruction and Development would cost, but said it planned to hold a tender for a second wind farm, twice as powerful, in the adjacent area in the future.

The EBRD said separately that its shareholders, together with the government of Japan, were providing technical assistance to the Uzbek authorities. The Uzbek ministry said it planned to build wind farms with a total capacity of up to 3 gigawatts over the next 10 years as part of its campaign to diversify energy sources. Uzbekistan has already struck deals on solar plant construction with several companies such as United Arab Emirates' Masdar and Saudi Arabia's ACWA Power, and is in talks with Russia's Rosatom on finalising a nuclear power plant project.

https://www.reuters.com/article/uzbekistan-windpower/uzbekistan-invites-bids-for-100-megawatt-wind-farm-project-idUSL5N2C34MZ

Op-ed

India

Can India catch up on nuclear medicine?

Jean-Philippe Vuillez

Sustainability, April 1, 2020

Amidst the coronavirus pandemic, nuclear medicine is having its time to shine. The International Atomic Agency (IAEA) is providing diagnostic kits and training to countries interested in using

nuclear-assisted tests to detect the virus and track its transmission paths. It's not surprising that nuclear medicine is set to play a key role in the fight against the novel coronavirus. Nuclear medicine, which relies on the use of radioactive drugs or radiopharmaceuticals (RPs) for either diagnostic or therapeutic purpose, has rapidly become a crucial medical field and a shining example of the peaceful application of atomic energy.

A typical nuclear medicine examination consists of injecting a radiolabeled molecule as a biomarker that allows the tracking and detection of specific disease processes, and their evolution over time. Doing so is crucial for diagnosing and treating a variety of diseases, including cancer, heart, lung and kidney conditions as well as infectious diseases – especially important in the current Covid-19 pandemic. The widespread use of RPs in nuclear medicine makes it clear that their reliable supply is crucial to upholding high medical standards across the globe. While a group of around 20 RPs, such as technetium-99m (Tc-99m), the most widely used medical isotope, have become indispensable, research is ongoing on others which may prove to be highly innovative and a big evolutionary step in modern personalized medicine.

https://www.sustainability-times.com/in-depth/can-india-catch-up-on-nuclear-medicine/

Why India's Nuclear Triad Is Such a Dangerous Weapon

Caleb Larson

National Interest Blog, April 9, 2020

India's indigenously developed technology—and a lot of Russian hardware and help—all keep Pakistan and China at bay. "An NFU policy essentially constitutes a promise, backed by a survivable nuclear arsenal, to only use nuclear weapons in response to a nuclear attack," explained a Carnegie publication. "The logic is simple and effective: you don't nuke me, and I won't nuke you. India and China both have declared no-first-use policies, whereas Pakistan and the United States, among others, do not rule out the first use of nuclear weapons in a conflict."

Despite India's formidable nuclear arsenal, India had since 2003 maintained it will not use said weapons of mass destruction first, but strictly in a retaliatory manner for deterrence. However, 2019, India called their no first use policy into question when Indian Defense Minister Rajnath Singh said that "Till today, our nuclear policy is 'no first use'. What happens in future depends on the circumstances." This curious statement is perhaps an example of deliberate strategic ambiguity.

https://nationalinterest.org/blog/buzz/why-india%E2%80%99s-nuclear-triad-such-dangerous-weapon-142272

Pakistan's Tactical Nuclear Weapons A Bigger Threat To Pakistan Itself Than India

Defence News, April 12, 2020

Pakistan is one of the few countries and the only Islamic nation in the world to possess nuclear weapons. Pakistan's nuclear weapons are designed to offset India's huge superiority in conventional forces and deter the adversaries, writes Kyle Mizokami for the National Interest. Pakistan began developing nuclear weapons after its arch-rival India detonated its first nuclear bomb in 1974. A conservative estimate puts Pakistan's nuclear arsenal around 150 to 180 bombs. In 1998 Pakistan in

response to India's second nuclear test detonated five devices in a single day and a sixth one two days later.

To tackle growing Indian threats of punitive cross border strikes, Pakistan focused on developing tactical nuclear weapons. Tactical nuclear weapons or non-strategic nuclear weapons that have a low yield. These weapons unlike large nuclear weapons that are used for destroying large strategic or civilian targets in the enemy's territory are used for destroying military targets on the battlefield. Pakistan's economy is tiny when compared against India and as such it does not have a defense budget to counter India's vastly superior armed forces with the gulf widening every day. In an all-out ground war, India undoubtedly holds the edge. India had envisioned launching a counterattack with three Strike Corps of three divisions, all highly mechanised and each including at least one armoured division in case of a Pakistani offensive. However, Pakistani Tactical Nuclear Weapons are meant to thwart India's counterattack in case of a failed Pakistani offensive to halt the advancing Indian troops dead in their tracks.

https://www.defencenews.in/article/Pakistan%E2%80%99s-Tactical-Nuclear-Weapons-A-Bigger-Threat-To-Pakistan-Itself-Than-India-OpEd-830126

Pakistan

The Scary State of Pakistan's Many Nuclear Weapons

Caleb Larson

National Interest Blog, April 9, 2020

Unlike India, Pakistan lacks a sea-based nuclear delivery platform and thus does not have a three-pronged nuclear triad. Worst still for Islamabad, Pakistan is hindered by a lack of cash, and there are questions about how secure the nuclear missiles in Pakistan are from falling into non-state actor's hands. Unlike India, Pakistan does not adhere to a no-first-use nuclear policy. That is to say, Pakistan reserves the right to use nuclear weapons first, rather than in retaliation after being struck first. India is Pakistan's main geostrategic enemy, and their nuclear arsenal exists only to deter India.

A Pakistani military officer, General Khalid Kidwai, mentioned in 2002 what Pakistan's nuclear use strategy could look like, saying that Pakistan would willingly launch nuclear missiles if the existence of the state was at risk.

https://nationalinterest.org/blog/buzz/scary-state-pakistans-many-nuclear-weapons-142277

Pakistan's Tactical Nuclear Weapons Should Terrify You

Kyle Mizokami

National Interest Blog, April 10, 2020

Of all the countries in the world, just nine are believed to have developed nuclear weapons. One member of this exclusive club is Pakistan, a country that occupies a unique strategic position on the Indian subcontinent. An ally of the United States and China and archenemy of India, Pakistan has developed a nuclear arsenal to suit its own particular needs. Unusually among the smaller powers,

Islamabad has developed an arsenal of tactical nuclear weapons designed to destroy enemy forces on the battlefield.

Pakistan began developing nuclear weapons in the 1950s, but the country's nuclear program accelerated in the mid-1970s after the detonation of "Smiling Buddha", India's first nuclear weapons test. Enemies since the end of the British Raj in 1947, India and Pakistan fought again in 1965 and 1971. In Pakistan's view as long as India was the sole owner of nukes it could engage in nuclear saber-rattling and had the ultimate advantage.

https://nationalinterest.org/blog/buzz/pakistan%E2%80%99s-tactical-nuclear-weapons-should-terrify-you-142937

USA

North Korea and America Should Focus on the Coronavirus Instead of Their War of Words

Cheryl Rofer

National Interest Blog, April 1, 2020

North Korea and the United States have been fighting a battle of words, struggling for control of the narrative. Such verbal jousting took place alongside sanctions imposed by the United States on North Korea and North Korea's continuing development of its nuclear weapons capability—eventually with summits in Hanoi and Singapore thrown in.

On the diplomatic front, Secretary of State Mike Pompeo has pressed for dominance with "denuclearization." This struggle is over the word "denuclearization" itself, which Kim uses as the same sort of long-term goal as the Nuclear Nonproliferation Treaty's general disarmament, but Pompeo uses to mean North Korea's giving up all its nuclear weapons and the program that produced them. Pompeo has pressed this meaning of the word alongside "complete, verifiable, and irreversible disarmament" and "final, fully verified denuclearization" to emphasize his point.

https://nationalinterest.org/blog/korea-watch/north-korea-and-america-should-focus-coronavirus-instead-their-war-words-139727

No, President Trump, you can't bomb a virus. We need expertise and empathy – not a war

Will Bunch

Inquier, April 2, 2020

When it was clear by mid-March that absolute denial of the coronavirus was no longer a strategy, President Trump tried to pull "a 180" and instead channel his inner Winston Churchill. No matter that the source of the global COVID-19 pandemic was a non-sentient virus that's measured in something called nanometers. Now, America would fight the coronavirus on the beaches, on the landing grounds, in the fields and in the streets and in the hills — and we shall never surrender. On March 17, Trump started calling the response to America's greatest public-health emergency in more than a century "a war" that was being waged against "an invisible enemy" that clearly was every bit as evil as the Nazis during World War II. "One day we'll be standing up here and say, 'Well, we won,' the

president told one of rambling White House briefings, seemingly fantasizing about an eventual ticker-tape parade down Wall Street's "Canyon of Heroes."

In the two weeks since then, the president and his men have doubled down on the military symbolism, even as it seems the only real similarity between the 2020 pandemic and actual combat will be the Vietnam War-sized body count of the casualties. Whether it's launching a military hospital ship on its voyage toward the front lines in New York City or appearing, as he did Wednesday, flanked by top Pentagon brass in uniform, Trump wants it known that he's not the bumbler who told Americans that coronavirus cases would soon go from 15 to zero, but rather "a war president."

https://www.inquirer.com/health/coronavirus/coronavirus-covid-trump-war-president-military-ventilators-20200402.html

What Would a Hypothetical U.S.-Pakistan War Look Like?

Kyle Mizokami

National Interest Blog, April 4, 2020

In order to proceed, let's sketch out two war scenarios. In one, we'll assume that the United States is pursuing an air-only campaign, in order to punish the country or strip it of some vital capability—nuclear weapons being a prime example. In the second scenario, the United States seeks to topple the country's government entirely, including the occupation of the capital, Islamabad. A prolonged U.S. air campaign would be a difficult proposition. Unlike past campaigns against Iraq, Somalia, Yemen, and Afghanistan, Washington would find regional allies who could provide air bases a difficult proposition. Pakistan enjoys warm relations with most of the Sunni states, particularly the United Arab Emirates and Qatar, both of whom have air bases capable of hosting U.S. tactical aircraft, as well as Saudi Arabia and Oman.

A U.S. air campaign directed against Pakistan would largely consist of bomber, carrier, and cruise missiles strikes. Strategic bombers, including the B-1, B-2, and B-52 would conduct strikes from the continental United States and the American base on Diego Garcia in the Indian Ocean. Only these aircraft have the range to strike targets in Pakistan from friendly bases. Depending on the level of international support, long-range bombers could also launch from the United Kingdom, including RAF Fairford, improving sortie rates. The U.S. Navy would play a major role. U.S. forces would neutralize the relatively weak Pakistani Navy. While the Pakistani Navy operates about one hundred ships, it has only a handful of surface combatants of frigate size or larger, and just five aging diesel-electric submarines. Once these are neutralized the U.S. Navy could bring its aircraft carriers closer to the coastline, conducting airstrikes against military targets. Surface warships and nuclear-powered attack submarines would contribute by launching swarms of Tomahawk land-attack cruise missiles against highly defended targets.

https://nationalinterest.org/blog/buzz/what-would-hypothetical-us-pakistan-war-look-141072

Why America Needs to Rethink Its National Security Priorities

Joseph Cirincione and William D. Hartung

National Interest Blog, April 6, 2020

The leaders of the House Armed Services Committee just announced that they are postponing the scheduled markup of the National Defense Authorization Act to "a later time." Good. It gives policymakers time to rethink their assumptions about what constitutes national security and how much money America should be spending on the military threats that have dominated traditional thinking. By the end of March, the death toll from the coronavirus pandemic matched the toll from the 9/11 attacks and proceeded to zoom past it within hours. The ultimate fatalities from this terrifying virus will be anywhere from ten to a hundred times more than from that terrorist attack. September 11 fundamentally changed U.S. security policy and spending priorities. So should the virus.

For almost twenty years the defense budget has been sacrosanct. Aside from a brief dip after the passage of the Budget Control Act of 2011, it has gone relentlessly upward, and is now more than we spent at the height of the Korean or Vietnam Wars or the Reagan buildup of the 1980s. These massive expenditures were considered vital to our national security by both political parties. But now this period must come to an end.

https://nationalinterest.org/feature/why-america-needs-rethink-its-national-security-priorities-141542

The B-1 Lancer Bomber: Built to Kill Millions with Nuclear Weapons

Caleb Larson

National Interest Blog, April 7, 2020

The B-1 Lancer is an impressive long-range, supersonic heavy bomber with variable-geometry wings designed for both supersonic and subsonic speed. Its nickname is The Bone. General Electric developed a new turbofan design for the Lancer that has an afterburner, meaning the airframe can dump additionally fuel into the rear of the engine for greatly increased thrust, albeit at a cost — greatly increased fuel consumption.

The B-1 has four of these GE afterburning turbofan engines for a combined total of 123,000 pounds of thrust, which propels the B-1 to Mach 1.2. Using its variable-geometry wings, the B-1 can sweep its wings back for high altitude, supersonic flight, or fly low, with wings outstretched while hugging the ground. This was the B-1's secret weapon.

https://nationalinterest.org/blog/buzz/b-1-lancer-bomber-built-kill-millions-nuclear-weapons-141572

Why America Should Believe Iran When It Says It Doesn't Want Nuclear Weapons

John Spacapan

National Interest Blog, April 11, 2020

If news reports are correct, then Iran wants to build a bomb. But in the two months since its muted response to the American strike that killed Iran's Maj. Gen Qassim Suleimani and the country seems intent on signaling rather than proliferating. In January, Iran's foreign minister, Mohammad Javad Zarif, threatened to withdraw from the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). But has made no further indication to do so since then. Last week, Tehran invited the IAEA to observe that it had tripled its stockpile of low-enriched uranium, an initial step toward restarting a nuclear weapons program but a move short of qualifying as a renewed weapons program.

At first glance, Iran's hesitance flies in the face of conventional wisdom. North Korea, Putin, and American neo-realist scholars alike assert that enemies of the United States pursue nuclear weapons because it's the obvious and rational choice to make. The last decade has taught Tehran that dictators in the Middle East are far more likely to be killed or overthrown by their own people than by the United States. In the last nine years, all three of Libya's Arab neighbors have succumbed to regime change. In many ways these regimes were the lucky ones, they weren't murdered like Ali Abdullah Saleh in Yemen or engaged in a decade of civil war-like Bashar al-Assad in Syria. In none of these cases would nuclear weapons have deterred uprising from within. All of this suggests that when Iranian officials say they do not want to get a bomb, maybe America should listen. If it did, then it would make sense to double down by reminding the Iranians of all the good reasons to hold off.

https://nationalinterest.org/blog/middle-east-watch/why-america-should-believe-iran-when-it-says-it-doesnt-want-nuclear-weapons

Mining on the Moon by the US, will Space Militarization follow soon?

Huma Siddiqui

Financial Express, April 14, 2020

Moon is considered a trove for rare elements. Rare-earth elements are considered rare since they appear in only small concentrations on Earth. The process to extract these elements from host rocks is extremely difficult. Modern electronic items use these rare elements for critical functioning. For example, Yttrium is used in laser technology, Neodymium used in magnets and Europium used in televisions. Such elements can be considered vital to emerging technologies and China holds the largest reserves for these, making it about 90% supplier of these for the World.

As has been reported by the Financial Express Online earlier, India's Chandrayaan-1 mission discovered water presence on the lunar surface and this shall be most essential for sustenance of any colony on the Moon. Helium-3 element is only available on Moon since lunar surface captures these particles originating from the Sun and blown outwards by the solar winds. Helium-3 is considered as a fuel for fusion reactors and can help in future space travel

https://www.financialexpress.com/defence/mining-on-the-moon-by-the-us-will-space-militarization-follow-soon/1927922/

Russia

Putin could have another 16 years as president to re-establish Russia as a great power in the world

Sim Tack

Market Watch, April 2, 2020

The Kremlin's efforts to extend President Vladimir Putin's 20-year presidency will enable Moscow to sustain the policies that have seen Russia reclaim its great-power status, while postponing the political and socio economic instability that could result from transitioning to a new leader.

Prolonging Putin's tenure, however, will introduce greater long-term political challenges as he ages and risks a potential health emergency while in office. But even without such a crisis, postponing succession until 2036 will still set Russia's political elite up for having to deal with a transition of power at a time when popular pressures will be mounting over severe economic hardships.

https://www.marketwatch.com/story/putin-could-have-another-16-years-as-president-to-reestablish-russia-as-a-great-power-in-the-world-2020-04-01

Russia's Giant Nuclear Spy Ship Was a Floating Disaster

David Axe

National Interest Blog, April 7, 2020

In June 1981, the Soviet Union began building a huge, nuclear-powered reconnaissance ship specifically designed to sail thousands of miles to the U.S. missile test site at the remote Kwajalein Atoll in the middle of the Pacific Ocean. There, the vessel would sit for months, hoovering up electronic data in order to determine what America's most secretive weapons could do.

But the spy ship Ural, completed in May 1983, sailed only once—from the Baltic shipyard where she was built to her home port of Vladivostok—and never went anywhere near Kwajalein. Hobbled by faulty hardware, cursed with bad luck and starved of funds for repairs, Ural was slowly dismantled. The giant spy ship's sad history is a window into the vast, sophisticated and highly secret machinations of Cold War espionage—machinations that sometimes didn't quite work out as planned. And sometimes resulted in weaponry that was more dangerous to its operators than to the enemy.

https://nationalinterest.org/blog/buzz/russia%E2%80%99s-giant-nuclear-spy-ship-was-floating-disaster-141567

Is Russia Building a Secret 'Hunter-Killer' Nuclear Attack Submarine?

Peter Suciu

National Interest Blog, April 8, 2020

Last December Russian state-owned TV aired a segment that may have revealed the first views of a new Russian submarine, reported H. I. Sutton for Forbes.com earlier this year. Eagled-eyed Sutton noted that the segment "showed an official model of a new submarine together with previously known types." Was that a model of the secret Laika-class, a hunter-killer designed to counter western nuclear-powered submarines? If it was a model of Laika, Sutton suggested it may have been deliberate – a way for the Russians to tease western military analysts without really giving much information about the new class of submarines, which are likely to replace the Russian Navy's current Akula and Sierra classes of attack submarines.

Russia has one of the largest submarine fleets in the world, but it is aging, including nuclear and conventional attack submarines; guided-missile subs armed with cruise missiles; and ballistic missile submarines that are armed with long-range nuclear weapons. The majority of the boats were commissioned between the 1980s – almost all of its 16 nuclear-powered-attack subs were built for the Soviet Navy – and the 1990s, meaning that older ones are approaching 40 years of service.

https://nationalinterest.org/blog/buzz/russia-building-secret-hunter-killer-nuclear-attack-submarine-141972

Nuclear Arms Nightmare: Don't Let New START Die

Colleen Moore and Ben Freeman

National Interest Blog, April 8, 2020

In the coronavirus era it can be challenging to remember what happened just ten days ago, let alone a decade ago. But, ten years ago, April 8, 2010, was a pivotal moment in U.S.-Russia relations that is well worth recollecting. That was the day the United States and Russia signed the historic New Strategic Arms Reduction Treaty (New START), an agreement to reduce U.S. and Russian nuclear weapons. An agreement that is now, thanks to growing strains in the relationship, in danger of unravelling.

A major part of the problem is that since the 2016 elections, America has been hyper focused on foreign interference in U.S. elections, and no foreign power is more synonymous with election interference than Russia. After the intelligence community's assessment that Russian President Vladimir Putin ordered an influence campaign designed to hurt Hillary Clinton and help Donald Trump, many Americans have become distrustful of Russia. Democrats' loathing of Russia soared, not surprisingly. Republicans, while not sharing the full extent of Democrats' disdain, have a highly unfavorable opinion of Putin. In fact, Russia is seen less favorably by all Americans now than at any time since the end of the Cold War.

https://nationalinterest.org/blog/skeptics/nuclear-arms-nightmare-dont-let-new-start-die-142012

Russia's ICBM: How Billions Could Die at the Push of a Button

Caleb Larson

National Interest Blog, April 9, 2020

Russia inherited the world's most extensive missile collection from the Soviet Union, which it actively maintains and upgrades. In the Russian exclave Kaliningrad, missiles serve in an anti-access/area-denial role, whereas in Russia proper, missiles are rather part of Russian strategic deterrence both regionally with non-nuclear missiles, and globally via nuclear-armed missiles.

Though haltingly, Russia is moving to modernize it's ballistic and cruise missile arsenal and is a global leader in both missile production and technical knowledge. Of special note is Moscow's larger, long-range missiles that have a range to hit countries thousands of miles away--like the United States.

https://nationalinterest.org/blog/buzz/russias-icbm-how-billions-could-die-push-button-142417

West Asia

Iran

Iran needs to be on board if Middle East is to change

Khaled Abou Zahr

Arab News, April 09, 2020

The coronavirus disease (COVID-19) is one of the biggest challenges the world has faced in decades, with some comparing its impact to that of the Second World War. As the number of confirmed cases exceeds 1.5 million and the news of UK Prime Minister Boris Johnson being treated in intensive care baffles the world, this pandemic will nevertheless not be the end of globalization. It might act as a catalyst to some previous trends, such as the competition and decoupling between the US and China, but it has actually put forward the need for more transparency, global communication and collaboration between governments, not less.

Indeed, opacity and a lack of communication have had catastrophic consequences. A quick overview of various government interactions shows that, the more data was shared, the better actions were taken against the virus. When it comes to the Middle East, most countries, especially those in the Gulf, were transparent in their measures and their reporting, while Iran took a defiant stance toward the virus, as if it was a political enemy or a conspiracy. This came at the cost of many lives and greater instability in the region. Nevertheless, there have been some positive developments in the region, including the fact that the UAE helped Iran face the pandemic. Another positive is the Arab coalition's unilateral cease-fire in Yemen, as well as Saudi Arabia's allocation of $500 million to the UN humanitarian response plan for Yemen, which will help protect all Yemenis — including the Iran-backed Houthis — from COVID-19.

https://www.arabnews.com/node/1655956

Iran's US-sanctioned banks operating freely in Germany

Dr. Majid Rafizadeh

Arab News, April 12, 2020

Without the assistance of Iran's banks, it is difficult to imagine that the Islamic Revolutionary Guard Corps (IRGC) and it elite branch the Quds Force would have been capable of accruing such remarkable power — exporting the regime's revolutionary principles, carrying out extraterritorial operations, sponsoring and arming terror groups, and attempting to assassinate foreign political figures and dissidents.

This is why one of the first set of sanctions the US reimposed on Iran following its 2018 withdrawal from the nuclear deal was linked to the regime's banking system. The US Department of Treasury targeted 50 Iranian banks and their foreign and domestic subsidiaries with the sanctions it announced in November 2018. This was its largest single-day action "targeting the Iranian regime's abuse of Iran's banking sector to fund its destabilizing activities." The Treasury added that the Iranian regime had funneled the equivalent of billions of dollars for the Quds Force through the banking sector. Despite this tough US stance, unfortunately many of the sanctioned Iranian banks are still operating with impunity in Germany.

https://www.arabnews.com/node/1657611

Israel

How Turkey is turning into the next Iran

Benjamin Weil

Israelhayom, April 4, 2020

While Iran has virtually no close ties with the West and certainly does not speak with the White House, Turkey is a NATO member, and President Recep Tayyip Erdogan speaks from time to time with US President Donald Trump. Other than that, the resemblance between Turkey in past few months and Iran is strikingly odd. Is Iran serving as Turkey's role model, or does it just so happen that it has taken similar courses of action?

Looking at the years prior to the 1979 Islamic Revolution, the United States has helped Iran develop government institutions and Westernize the country culture. One such move was the White Revolution, an aggressive campaign of social and economic Westernization that included redistribution of land, increased rights for women, and attempts to improve literacy and health in rural areas. Following the revolution and the rise of Ayatollah Ruhollah Khomeini, Iran has become more hostile towards the West and turned its back to the liberal reforms.

https://www.israelhayom.com/opinions/how-turkey-is-turning-into-the-next-iran/

Israel's Nuclear Missiles Could Smash You Back to the Stone Age

Caleb Larson, April 6, 2020

Israel's missile capabilities are perhaps among the most advanced in the Middle East. Through extensive aid from the United States and Europe, as well as collaboration in developing missiles, Israel has been able to nurture a mature domestic missile production capability that has been successful as exports. Most of Israel's missiles are relatively short- to medium-range, they also have several missiles in the Jericho family that can reach out into the 1,500 to 4,800-kilometer range (930 to 3000 miles).

Although originally designed as a decoy to distract enemy air defenses, the Delilah today functions as a subsonic cruise missile and is compatible with a wide suite of Israeli aircraft. Due to its stubby wings, it has the ability to loiter after launch until the appropriate detonation time and has a range of 250 to 300 kilometers. It was used in 2006 by the Israeli Air Force over Lebanon against a Hezbollah arms convoy. It is reportedly accurate to one meter.

https://nationalinterest.org/blog/buzz/israels-nuclear-missiles-could-smash-you-back-stone-age-141242

East Asia

South Korea

Amid coronavirus outbreak, Doosan Heavy Industries should not receive public funds
Mathew Garry
Korea Herald, April 6, 2020

Financial markets are being strained by the novel coronavirus outbreak all over the world. In Korea, the total amount of corporate bonds, which are due next month, have surpassed a record-breaking 6.5 trillion won ($5.26 billion). Funds placed in high-risk, high-return investments have now been moved to the low-risk, low-return investments, causing a major crisis for the companies in the high-risk group.The situation facing Doosan Heavy Industries & Construction represents such a case. For DHI, 1 trillion won of corporate bonds are to mature by May. However, DHI's total market value as of late March 2020 stands only at 800 billion won, and its loans also amount to over 3 trillion won.

About 60 to 80 percent of DHI's revenue comes from its overseas coal power plants. DHI's overseas coal power project pipeline has rapidly declined in the past five years. This is not due to the stagnation of the energy market, as power plants are still being constructed -- just not coal and nuclear plants. The real reason for this change lies with the changing energy market trend. In the past 10 years, the cost of renewable energy decreased to one-tenth of what it used to be, causing most energy companies to favor solar and renewable energy. It is already cheaper to generate electricity from new renewables than from new coal plants in all major markets, including the US, EU, Australia, Japan, Vietnam and Indonesia. Over half of all coal plants operating today cost more to run than building new renewables.

http://www.koreaherald.com/view.php?ud=20200405000221&ACE_SEARCH=1

Think Tanks

New Information about Iran's Production of Uranium Hexafluoride under the Amad Plan

David Albright and Sarah Burkhard

Institution for Science and International Security, April 2, 2020

The Iran Nuclear Archive contains new information about Iran's secret efforts in the early 2000s to make uranium hexafluoride (UF6) for its nuclear weapons program, codenamed the "Amad Plan." "Project 5" of the Amad Plan had responsibility for ensuring the supply of UF6, the essential feedstock for the military Al Ghadir enrichment plant, a plant slated to make weapon-grade uranium for use in nuclear weapons, known today as the Fordow Enrichment Plant. In general, Project 5 was in charge of uranium mining, milling, and conversion for the nuclear weapons program, operating in parallel, albeit connected partially and indirectly, with the much larger, more open Atomic Energy Organization of Iran's (AEOI's) uranium mining and conversion efforts, those activities largely concentrated at the Saghand uranium mine, the Ardakan uranium mill, and the Esfahan uranium conversion facilities.

Other Institute studies have explored Project 5's Gchine uranium mine and mill project and its post-Amad coverup, featuring the role of the military contractor Kimia Maadan. The International Atomic Energy Agency (IAEA) has discussed the military program to produce uranium tetrafluoride ("green salt"), an intermediate compound vital to produce uranium metal and uranium hexafluoride, its inspectors identifying the central role of Project 5 and the contractor Kimia Maadan in that production. The IAEA had obtained a process flow diagram for a bench-scale, one metric tonne per year operation, and preliminary design plan for a 50 metric tonnes per year production facility. Despite technical inconsistencies in one of the diagrams, the IAEA judged the drawings as credible and separate from the green salt process at the AEOI's Esfahan green salt production

facilities, associated principally with making uranium hexafluoride for the Natanz uranium enrichment plant.

https://isis-online.org/isis-reports/detail/irans-production-of-uranium-hexafluoride-under-the-amad-plan

Coronavirus and the IAEA reports: From maximum pressure to humanitarian détente with Iran

Robert J. Goldston

Bulletin of Atomic Scientists, April 6, 2020

On March 3, 2020, the new director general of the International Atomic Energy Agency (IAEA), Rafael Grossi, released two important reports. The first was the IAEA's regular quarterly report on Iran's compliance with the 2015 Joint Comprehensive Plan of Action (JCPOA), colloquially called the Iran nuclear deal. That report details the rapid growth of Iran's stockpile of enriched uranium over the last several months. After respecting the constraints of the JCPOA for three years, with at first little economic benefit and then greatly increased sanctions, Iran is now violating the deal's constraints on uranium enrichment. Importantly, however, it has continued to allow the IAEA the same unprecedented access for verification and monitoring that was defined in the deal.

The second report, not associated with the JCPOA, discusses Iran's compliance with its safeguards agreements under the Nuclear Non-Proliferation Treaty (NPT). This second report indicates that Iran has not complied with requests for information about, and access to, sites where Iran may have engaged in undeclared nuclear activities nearly 20 years ago. Iran claims that the JCPOA closed the file on its earlier activities, and so these requests are illegitimate. In fact, however, the JCPOA closed the file on the then-existing evidence of earlier activities, but not on new evidence that might become available to the IAEA.

https://thebulletin.org/2020/04/coronavirus-and-the-iaea-reports-from-maximum-pressure-to-humanitarian-detente-with-iran/

Is Iran's Nuclear Future in the Hands of Russia and China?

Mark Hibbs

Carnegie, April 7, 2020

Five years after Tehran concluded a landmark nuclear agreement with foreign powers, concern about Iran's nuclear peaceful-use credentials has resurfaced. In coming weeks, months, and beyond, Russia—and perhaps China—may be called upon to take the lead in securing Iran's cooperation to manage this issue.

Under the Non-Proliferation Treaty (NPT), Iran is obligated to declare all its nuclear materials and activities to the International Atomic Energy Agency (IAEA). But on March 9, 2020, the IAEA told its governing board of thirty-five member states that Iran is refusing to provide access to and explanations concerning three possible nuclear sites.

https://carnegieeurope.eu/strategiceurope/81484

Prevent the outbreak of another global security threat. Extend New START.

Daryl G. Kimball

Bulletin of Atomic Scientists, April 8, 2020

As the United States and other nations appropriately focus on the steps necessary to deal with the deadly effects of the coronavirus pandemic and its economic fallout, the international community cannot afford to lose sight of the other global challenges that threaten all of us: the worsening planetary climate emergency and the ongoing threat of catastrophic nuclear war. We're not only at a pivotal point in the struggle against the fast-moving coronavirus; we are also at a tipping point in the long-running effort to reduce the threat of nuclear war and eliminate nuclear weapons. Tensions between the world's nuclear-armed states are rising; the risk of nuclear use is growing; billions of dollars are being spent to replace and upgrade nuclear weapons; agreements that have kept nuclear competition in check are in serious jeopardy.

At a UN Security Council session on nuclear weapons issues convened in February, the high representative for disarmament affairs, Izumi Nakamitsu, warned that "relationships between states, especially nuclear-weapon states, are fractured. The specter of unconstrained nuclear competition looms over us for the first time since the 1970s. Regional conflicts with a nuclear dimension are worsening, and proliferation challenges are not receding." One of the most important ways to move the world further away from the nuclear precipice would be for President Trump to take up Russia's standing offer to extend the only remaining treaty limiting the world's two largest nuclear arsenals—the New Strategic Arms Reduction Treaty (New START)— for five years and ultimately build on New START for a more comprehensive arms control regime in the future.

https://thebulletin.org/2020/04/prevent-the-outbreak-of-another-global-security-threat-extend-new-start/

How nuclear forces worldwide are dealing with the coronavirus pandemic

John Krzyzaniak

Bulletin of Atomic Scientists, April 14, 2020

In recent weeks, the coronavirus outbreak has elicited at least a few tone-deaf comments from top US defense officials about the readiness of their nuclear forces. In mid-March, the commander of US Strategic Command, Adm. Charles Richard, reassured his audience that the United States' nuclear forces had not been adversely affected by the pandemic and that they "remain ready to execute the nation's strategic deterrence mission." In effect, Adm. Richard was telling his audience that the United States was still capable of launching a massive nuclear retaliation that would undoubtedly kill millions. Similarly, at the beginning of April, the commander of the US Air Force's Global Strike Command told Popular Mechanics that, despite the COVID-19 outbreak, "its nukes are still ready to fly." These officials were apparently oblivious to the notion that, with the pandemic already causing enough fear and dread on its own, now may not be the best time to remind the general public about other ways the world could end.

The rhetoric notwithstanding, the US nuclear mission and its analogues around the world rely heavily on people, and people are exactly what the virus is after. Just a few days after Adm. Richard gave his

briefing, Newsweek reported that "units feeding [US Strategic Command] have a cumulative 106 uniformed personnel not on duty due to coronavirus, either because of confirmed cases or 'protective self-quarantine.'" On April 9, Hans Kristensen, director of the Nuclear Information Project at Federation of American Scientists, tweeted that all US nuclear bases except one had confirmed cases of COVID-19.

https://thebulletin.org/2020/04/how-nuclear-forces-worldwide-are-dealing-with-the-coronavirus-pandemic/

Reports and interviews

Interview: Duyeon Kim on South Korea's elections in the midst of a coronavirus pandemic

John Mecklin

Bulletin of Atomic Scientists, April 13, 2020

This week, South Korea will hold National Assembly elections amid a coronavirus pandemic, previewing the difficulties that democracies around the world—including the United States—will face in administering their own electoral contests in coming months. Ahead of the South Korean vote, I asked Bulletin columnist Duyeon Kim, a senior adviser for Northeast Asia and nuclear policy at the International Crisis Group, for her views on the variety of intersecting political crosscurrents that connect and affect the upcoming South Korean election, the coronavirus pandemic, and the status of relations between North and South Korea. The interview was conducted via email and lightly edited for clarity.

https://thebulletin.org/2020/04/interview-duyeon-kim-on-south-koreas-elections-in-the-midst-of-a-coronavirus-pandemic/

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Indian Pugwash Society welcomes research articles from students, researchers and faculties on Space, Missile, nuclear technology, WMD proliferation, arms control, disarmament, export controls and other related issues. Articles should be crisply written and should address contemporary debates in the policy arena. Manuscripts submitted for the consideration of the Indian Pugwash Society should be original contributions and should not have been submitted for consideration anywhere else. For further assistance, please contact us at: indianpugwashsociety@gmail.com

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