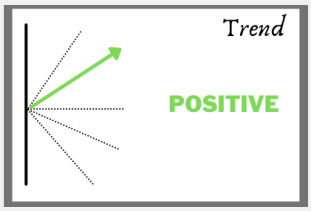
CAPS Nuclear Tracker

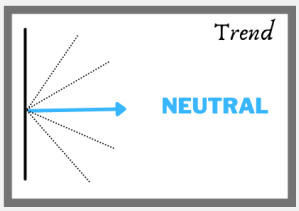
Issue 2: October-December 2021

Greetings from NukeNerds as we present our second edition of *CAPS Nuclear Tracker*. The last quarter of this year was not marked by any spectacular developments on the long-standing proliferation issues of Iran and North Korea; nor on non-proliferation and disarmament. On all these fronts, the trendlines remain neutral. The space to watch, however, in the coming months, will be the outcome of the NPT RevCon scheduled for Jan 2022. Meanwhile, on nuclear power and nuclear security, the trend remains positive with many countries re-expressing their interest in nuclear power and engaging with IAEA on nuclear security. The most negative developments were seen in the sphere of vertical nuclear proliferation where the nuclear armed states tested new missiles of varied ranges and types even as relations between major nuclear powers remain stressed. As we sign off 2021, NukeNerds at CAPS wish you good health, happiness and lots of productive activity in the new year. Happy 2022!!

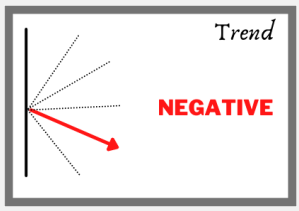
TREND OVERVIEW



- **Nuclear Energy**
  Ms Zoya Akhter
- **Nuclear Security**
  Ms Zoya Akhter



- **Nuclear Non-Proliferation**
  Dr Manpreet Sethi
- **Nuclear Arms Control**
  Dr Silky Kaur
- **Nuclear Disarmament**
  Dr Manpreet Sethi

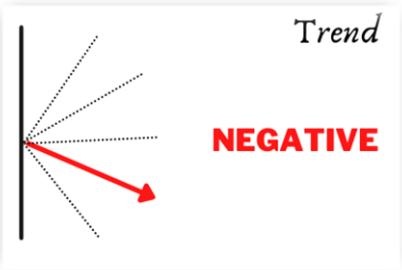


- **Vertical Nuclear Proliferation**
  Mr Abhishek Saxena
  Ms Nasima Khatoon
- **Sea-Based Nuclear Developments**
  Mr Anubhav S. Goswami
- **Iran**
  Dr Silky Kaur
  Mr Nichole Ballawar
- **North Korea**
  Dr Silky Kaur

Vertical Nuclear Proliferation

Abhishek Saxena and Nasima Khatoon

Previous Trend: Negative

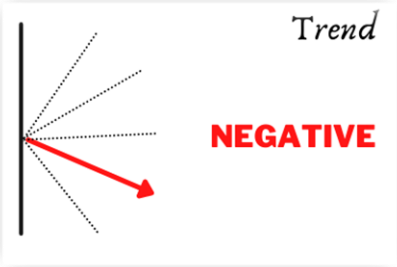


Three hypersonic tests demonstrating "advanced hypersonic technologies, capabilities, and prototype systems", as part of the **US** Navy's Conventional Prompt Strike (CPS) and the US Army's Long Range Hypersonic Weapon (LRHW) programme, were successfully conducted on October 20. On October 4, **Russia** successfully test-fired Zircon missile—a hypersonic cruise missile capable of launching from both underwater and surface platforms—from Severodvinsk submarine. This was the first underwater test of Zircon. More tests of Zircon, all repeatedly successful were conducted by Russian Navy on November 18, November 29, and December 15. Amidst a flurry of hypersonic weapon tests, Russia has started serial production of Zircon. It will likely be commissioned in a surface role by the Russian Navy in 2022 and in an underwater role in 2025. Russia's state-owned news agency *TASS* has also reported the deployment of the first regiment of S-500 air defence systems around Moscow. In an array of media reports in October, *Financial Times* revealed that **China** had conducted two tests of hypersonic systems on July 27 and August 13. The missile tested in July had reportedly circumnavigated the globe before hitting its target, demonstrating the ability to incorporate a hypersonic glider into a Fractional Orbital Bombardment System (FOBS). A follow-up scoop reported that the July hypersonic test had demonstrated another technological advance that enabled the weapon to launch an air-to-air missile or possibly a countermeasure as it approached the target travelling at hypersonic speed. A recent Pentagon report has forecast that China's nuclear build-up might enable it "to have up to 700 deliverable nuclear warheads by 2027" and at least 1000 warheads by 2030. **India** successfully conducted the first night trial of Agni-V ballistic missile in late October. This was the sixth test of the ICBM and the first carried out in "full operation configuration" by the Strategic Forces Command. On December 18, India conducted the second test of its new generation Agni-P ballistic missile,

a two-staged solid propellant, canisterised missile with a "dual redundant navigation and guidance system". On November 26, **Pakistan** conducted a flight test of the nuclear-capable, Shaheen-1A ballistic missile. On December 21, Pakistan tested the Babur cruise missile 1B, with a reported range of 900 km. This is twice the range of an earlier version of Babur.

Sea-Based Nuclear Developments

Anubhav Shankar Goswami

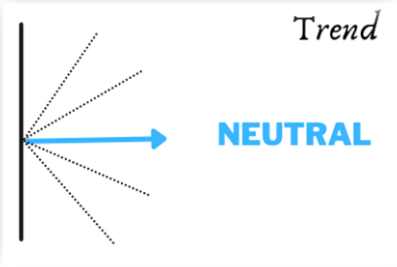


AUKUS, the trilateral security pact between **Australia**, **UK** and **US** was formally signed in November 2021. This has brought a new focus on nuclear-powered submarines. With an unstated goal to counter China, it envisages the exchange of sensitive "naval nuclear propulsion information" to Australia. On December 18, Canberra, London, and Washington held the inaugural meetings of the AUKUS Trilateral Joint Steering Groups and "agreed on the next steps to define the optimal pathway for Australia to acquire nuclear-powered submarines". Meanwhile, it was reported on November 10 that **South Korea** is making plans to start work on an indigenous civil nuclear reactor. Going by its multipurpose nature, observers believe that the reactor is actually meant for the South Korean Navy's (ROKN) nuclear submarine program. In Latin America, in a ceremony held on November 25, the **Brazilian** Navy entered into an agreement to build the hull of its first nuclear-powered submarine (SSN), the "Álvaro Alberto", as part of the SN-BR project. The project has been launched in cooperation with France, which is helping with submarine design and integration while Brazil is designing and building the reactor. **India** is also showing urgency to acquire nuclear powered platforms in the context of the rapid rise of Chinese naval influence in the Indian Ocean. It may be recalled that in April this year, the Indian Navy had approached the Central government to amend the Cabinet Committee of Security (CCS) approved 30-year submarine building plan by replacing six conventional attack vessels with SSNs. The **U.S** Navy has proposed the procurement of a new class of nuclear-powered attack submarine, called the Next-Generation – SSN(X) – as a successor to the Virginia-class SSN design.

Nuclear Non-Proliferation

Manpreet Sethi

Previous Trend: Negative

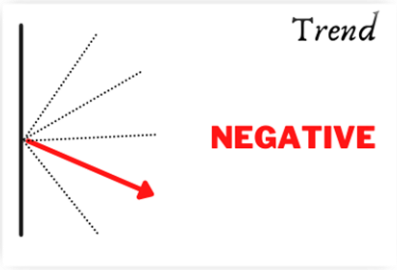


In the run up to the **NPT RevCon** scheduled for early Jan 2022, a number of activities were undertaken by state parties to the NPT to try to ensure a successful outcome of the conference. One such event was organised on December 9 by the government of **Japan**. PM Fumio Kishida called on all nuclear weapons states to increase transparency of their nuclear capability as he pledged his utmost for the adoption of a final document at the NPT conference. Meanwhile, earlier in November 2021, the **P-5** too held meetings to align their positions ahead of the RevCon. The Russian representative announced at a meeting of the UN General Assembly's First Committee that agreement had been reached on three statements – on the Treaty on the Prohibition of Nuclear Weapons (TPNW); on the prohibition of production of fissile material for nuclear weapons and other nuclear explosive devices; on the zone free of nuclear weapons in Southeast Asia. Later, on December 7, the P-5 presented a Working Paper on strategic risk reduction as part of their efforts at showcasing movement on nuclear disarmament at the NPT RevCon. The preamble of the paper NPT/CONF.2020/WP.33 mentioned that the five "recognize their responsibility to work collaboratively to reduce the risk of nuclear conflict…. and promoting strategic stability and predictability." It was stated that deliberations on the topic of strategic risk reduction would provide "an opportunity to increase mutual understanding through dialogue and examine the options for additional practical measures that could reduce the likelihood of nuclear weapons use." This was publicised as being consistent with the P-5 long-term efforts towards disarmament and the ultimate goal of a world without nuclear weapons with undiminished security for all

Iran

Silky Kaur and Nichole Ballawar

Previous Trend: Neutral

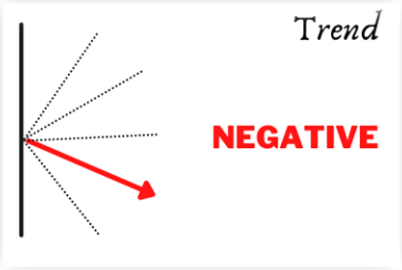


The negotiations that were being held since November 29 in Vienna to revive the 2015 nuclear agreement between **Iran** and six world powers namely Britain, France, Germany, China and Russia and the US (indirectly) were adjourned on December 17 and resumed on December 27. There are mixed signals on the progress of talks. US and European officials stated that it was a "disappointing pause" and talks with Iran are "rapidly reaching the end of the road". Though some technical progress has been made but there is frustrating lack of progress and a feeling that the time to revive the original Joint Comprehensive Plan of Action (JCPOA) is running out. Iran has demanded that all U.S. sanctions imposed under the Trump administration be removed. European diplomats have dismissed this position as unacceptable, leading to a stalemate. Meanwhile, amidst ongoing talks, on December 15, Iran agreed to allow IAEA to reinstall cameras at a facility manufacturing centrifuge parts in Karaj. This was considered conducive to get the JCPOA negotiations moving. But, the next day, Iran stated that IAEA will not be able to examine camera images until sanctions were lifted. Iran also continues to increase its nuclear activities. An IAEA report on December 1 stated that since November 30, Iran had begun enriching uranium to 20 percent using a cascade of 166 advanced IR-6 centrifuge machines at its Fordow enrichment site. In another significant development that could impact efforts to restrain Iran's nuclear ambitions, US intelligence agencies have reported that **Saudi Arabia** is manufacturing its own ballistic missiles with the help of China.

North Korea

Silky Kaur

Previous Trend: Negative

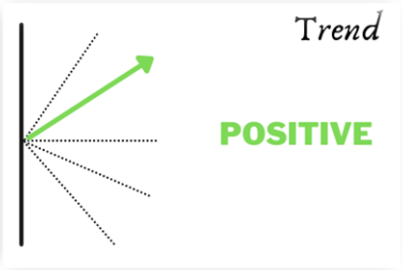


On October 12, **North Korea** released photos of "The Defense Development Exhibition Self-Defense 2021" showing the Hwasong-8 hypersonic missile on a road-mobile launcher. North Korea state media stated that development of the hypersonic missile was "one of 5 top priority tasks facing the strategic weapon sector". Meanwhile, a day earlier, on October 11, President Kim Jong un, while displaying his cache of ICBMs, had condemned US and South Korea for causing tension in the region. He also stated that he would continue developing strategic weapons systems as outlined at the January 2021 Party Congress but that these would be for self-defense only. On October 19, North Korea fired a submarine launched ballistic missile (SLBM) towards the sea off its eastern coast. It demonstrated advanced control guidance technologies that allowed the missile to maneuver in midair, thus making it harder to track and intercept. It is the first test in two years of an SLBM. The last two months of the year did not see any more nuclear or missile tests, but DPRK remains belligerent and the US has not shown any initiative to look for options of engagement.

Nuclear Energy

Zoya Akhter

Previous Trend: Positive

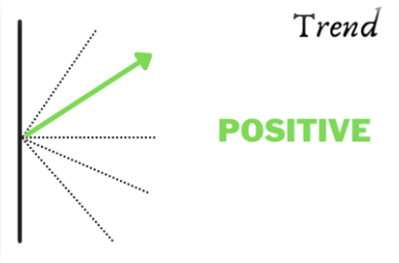


The Global Nuclear Industry Status Report 2021 revealed that in mid-2021 there were 415 operational reactors in 33 countries, which is 7 more reactors than last year. This trend may continue as several countries have ramped up their nuclear programmes in the last few months. The **Indian** government has announced that it will have nine nuclear reactors by 2024. In October, **Bangladesh** Prime Minister announced the construction of another nuclear power plant after the first is completed. The second reactor at the Shidaowan nuclear power plant in **China**, which is the world first high temperature gas-cooled reactor nuclear plant using pebble-bed module, reached criticality on November 11. In the same month, China's first commercial nuclear heating project also met success as Haiyang became the first city in the country to be fully heated by nuclear power. **Japan's** energy policy which called for the promotion of nuclear and renewable power received government approval in October. **Vietnam** too is once again reconsidering its nuclear programme and announced its decision to build a research reactor with Russian help. In November, **Egypt** signed a contract with Russia for the construction of Dabaa nuclear plant. In **South Africa**, plans to set up two 500 MW nuclear reactors was approved by the country's National Energy Regulator. In October, the **US** government announced the Eielson base in Alaska as the site for the installation of micro reactor, likely to be operational by 2027. **French** President in November announced plans to construct new nuclear reactors, after decades of hiatus. In December, the **Netherlands** confirmed plans to build two new nuclear reactors to meet its climate goals. **Romania** has called for refurbishment of its units by 2037 and construction of two new CANDU reactors by 2031. In October, **UK** published a strategy to enable quick delivery of fusion energy. It also adopted a new financial model for nuclear power which could help in reducing the cost to consumers.

Nuclear Security

Zoya Akhter

Previous Trend: Positive

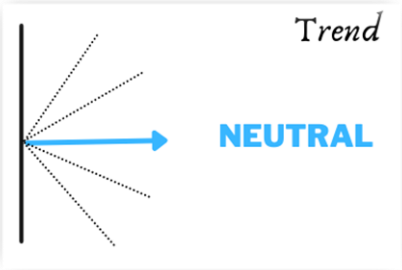


A team of experts from the International Atomic Energy Agency (IAEA) completed its first mission to **Senegal** in December 2021 and confirmed the establishment of a nuclear security regime in the country. In December, the Integrated Regulatory Review Service (IRRS) completed a follow-up mission to **Belarus** to review the country's progress in implementation of recommendations made during a previous mission in 2016. It announced that Belarus has significantly strengthened its regulatory nuclear safety framework. As **Egypt** is in process of setting up its first nuclear power plant, its President Abdel Fatah al-Sisi in December stated his interest in strengthening cooperation with the IAEA on nuclear security. **Japan** Atomic Energy Agency signed an agreement with IAEA to strengthen technical capabilities in areas of decommissioning, radioactive waste management, and nuclear security. The IAEA also came up with a technical report on managing the interface between safety and security for normal commercial shipments of radioactive material.

Nuclear Arms Control

Silky Kaur

Previous Trend: Neutral

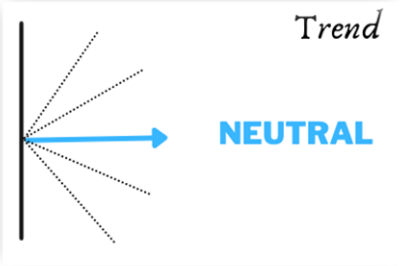


In a breakthrough virtual summit between **US** and **China** on November 15, Presidents Joe Biden and Xi Jinping agreed to explore talks on nuclear arms control. The two leaders discussed the urgency of "strategic stability". This is significant because China previously refused to hold nuclear talks due to the asymmetry in nuclear arsenals stockpiles. After the two rounds of strategic stability dialogues between US and Russia in July and September, the next round of Strategic Stability Dialogue has been scheduled for early 2022. Meanwhile **Russia** has tabled two draft treaties on December 17, namely the Treaty between US and Russian Federation on Security Guarantees and the Agreement on Measures to ensure the security of Russian Federation and Member States of the NATO. In these treaties Russia has called for restraints on INF range deployments in Europe and roll back military capabilities in new NATO states to the 1997 deployments. In a rare development on November 22, China's President Xi Jinping announced that China is ready to sign the "protocol to the Treaty on the Southeast Asia Nuclear Weapons Free Zone" (SEANWFZ) also known as **Bangkok Treaty**. This treaty was opened for signature in 1995 but for more than two decades China has not signed the treaty. The sudden desire to accede to the protocol make China the first nuclear weapon state to adhere to this treaty. It needs to be seen in context of AUKUS deal which will introduce nuclear powered submarine to non-nuclear-weapon state (NNWS), including the possibility of proliferation of such nuclear-powered attack submarine (SSNs) to **ASEAN** countries. This may have triggered the Chinese offer.

Nuclear Disarmament

Manpreet Sethi

Previous Trend: Neutral



On November 29, President Nazarbayev of **Kazakhstan** addressed the Global Alliance of Leaders for Nuclear Security and Nuclear-Weapons-Free World (GAL) which had been formed in 2019**.** He proposed to set up a Global Forum on Nuclear Non-proliferation and Disarmament in the capital of Kazakhstan to bring together key international NGOs and world moral authorities in the anti-nuclear field to forge a unified global agenda. Nazarbayev also called on the world community to develop a step-by-step Plan for a comprehensive reduction of strategic offensive arms with participation of all nuclear states under the auspices of the UN. Also, on November 29, the UN Secretary-General, while speaking at the second session of the Conference on the Establishment of a Middle East Zone Free of Nuclear Weapons and Other Weapons of Mass Destruction, called on all regional states to transform the vision of a **MEWMDFZ** into a working reality. **TPNW** that entered into force at the start of 2021 when the 50th state (Honduras) delivered its instrument of ratification, ended the year with ratification by 58 states. **Mongolia** and **Guinea Bissau** ratified it in December. The first meeting of States Parties of the treaty is scheduled for March 2022.

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CAPS research faculty comprises senior retired and serving Armed Forces officers from the three services besides academic scholars from national universities and retired members from the diplomatic community. CAPS also conducts nuclear strategy capsules for the Armed Forces and officers of security and technological organisations.