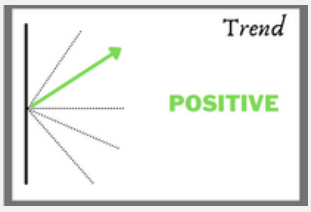
CAPS Nuclear Tracker

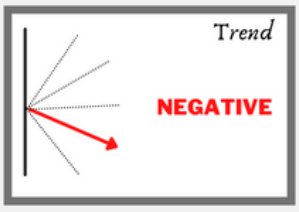
Issue IX: July - September 2023

As we complete the third quarter of the year, there have been no drastic changes in the trendlines on major nuclear issues. As is evident from the graphic below, most issues crowd the negative category. Some like arms control have disappeared from our chart for now. On the proliferation front, North Korea and Iran remain much in news, mostly for all the wrong reasons. In fact, the train trip of the North Korean leader to Russia where he got a ring's side view of many Russian nuclear and strategic weapon systems is a development that will likely have repercussions in the coming months and years. Interest in nuclear energy, especially in small modular reactors, continues to be high. Thankfully, nuclear security issues have not seen anything negative. Do write in to us with your thoughts and suggestions at capsnetdroff@gmail.com.

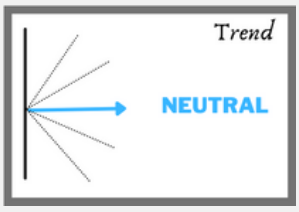
TREND OVERVIEW



- **Nuclear Energy**
  Dr Dhruba Tara Singh
  Ms Rishika Singh



- **Missile Developments**
  Mr Jay Desai
- **Iran**
  Dr Silky Kaur
- **North Korea**
  Dr Silky Kaur
- **Sea-Based Nuclear Developments**
  Mr Anubhav S. Goswami

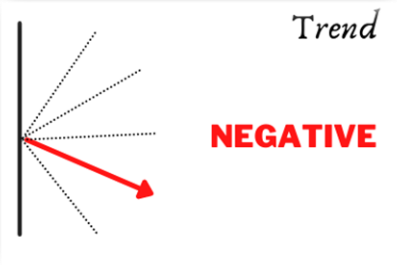


- **Nuclear Non- Proliferation & Disarmament**
  Dr Manpreet Sethi
- **Nuclear Security**
  Ms Prachi Lokhande

Missile Developments

Jay Desai

Previous Trend: Negative



During the quarter under consideration, major activity was seen in the sphere of the USA and its allies honing their missile defence capabilities. On July 5, 2023 Pentagon reported on construction of a US anti-missile base in a village named Redzikowo, Poland that would be completed by end of 2023. The same day, it was also reported that Switzerland and Austria will be joining the missile defence project of Europe. On July 14, 2023 it was reported that the UK and Poland will be working with each other for developing a common missile on the basis of MBDA's Common Anti-Air Modular Missile.

On July 13, 2023 it was reported that Israeli Defence Ministry, Israeli Armed Forces as well as Rafael Advanced Defense Systems conducted a number of tests in order to strengthen Israel's multi-layered missile defence system as well as to expand abilities of the David's Sling missile defence system. On August 17, 2023 it was reported that the US had approved a $3.5 billion sale of Israel's Arrow 3 missile defence to Germany. This Arrow missile has been jointly developed by US and Israeli missile defence organizations.

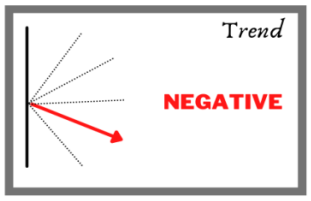
Amongst the major nuclear powers, on July 6, 2023 **UK** announced the launch of a 1-billion-pound framework to boost the hypersonic strike ability of the country. In the case of **Russia**, a Russian news agency report of September 1, 2023 the Sarmat has been formally inducted for combat duty. Sarmat is a heavy ICBM that has been developed by the Makeyev Design Bureau to replace the R-36 SS-18 'Satan' ICBM. On September 6, 2023 the US tested the Minuteman III ICBM. This missile carried three re-entry vehicles and covered a distance of 4200 miles. The Air Force Global Strike Command called the Minuteman III test a part of "routine and periodic activities".

On July 7, 2023 it was reported that Naval destroyer of **Iran** will be deployed with a hypersonic missile. On July 25, 2023 Iran introduced its new indigenously built cruise missile, 'Abu Mahdi'. It has a range of 1000 kms and uses artificial intelligence.
On July 12, 2023 the DPRK tested its Hwasong-18 missile for the second time. The DPRK state media reported that the missile is critical for its nuclear forces as well as to warn the US and other adversaries. The Hwasong-18 is a solid propellant ICBM and the launch was observed by the DPRK leader Kim Jong Un. The DPRK said that the range of the missile was recorded as 1001 kms during the current test flight and its seventy four minute flight test was the longest flight ever conducted. On July 24, 2023 the South Korean Defence Ministry stated that the DPRK fired two ballistic missiles into the Sea of Japan. On August 31, 2023 it was reported that DPRK fired two short range ballistic missiles in 'nuclear strike drill'. The DPRK Army said in a statement "tactical nuclear strike drill simulating scorched earth strikes at major command centers and operational airfields". On September 13, 2023 DPRK once again fired two short-range ballistic missiles. This happened while Kim Jong Un was meeting President Putin in Russia. This was the first time when DPRK tested missile while its leader Kim Jong Un was abroad.

Sea-Based Nuclear Development

Anubhav Shankar Goswami

Previous Trend: Neutral



Following the Washington Declaration, the United States sent a ballistic missile submarine (SSBN) to South Korea for the first time since the 1980s. This was meant to reassure Seoul by allowing it to coordinate actions with Washington in the event of a nuclear conflict with North Korea. The *Ohio-class USS Kentucky* landed at the South Korean port of Busan on July 17. South Korea's Defence Minister Lee Jong-sup described the submarine's visit as a sign of US readiness to carry out its "extended deterrence" promise, which calls for the US to employ all of its military resources, including nuclear weapons, to defend its allies.

Meanwhile, there was further deterioration in nuclear stability in the Korean peninsula, when on September 8, 2023, official media of North Korea claimed that the country had launched its first operational "tactical nuclear attack submarine" and had given it to the fleet that plied the waters between the Korean Peninsula and Japan. Leader Kim Jong Un declared at the launch ceremony on September 6 that submarine No. 841, which was given the moniker *Hero Kim Kun Ok* in honour of a famous North Korean historical hero, will be one of the primary "underwater offensive means of the naval force" of that country. Kim also disclosed that North Korea intends to speed up its effort to eventually construct nuclear-powered submarines by arming more current boats with nuclear weapons.

According to Choi Il, a retired South Korean submarine captain, the designation of "tactical" submarine implies that it does not carry submarine-launched ballistic missiles (SLBM) that can reach the U.S. mainland but rather smaller, shorter-range SLBMs or submarine-launched cruise missiles (SLCM) that can strike South Korea, Japan, or other nearby targets. According to analysts, the platform looks to be a modified *Romeo-class* submarine from the Soviet era, which North Korea purchased

from China in the 1970s and started manufacturing domestically. Its design, which had 10 launch tube hatches, indicated that it was likely equipped with ballistic and cruise missiles. The submarine didn't appear to be ready for routine operations, according to South Korea's military, and there were indications that North Korea was seeking to overstate its capabilities.

In other news, the Russia's *Borei-A* SSBN *Generalissimus Suvorov* began its journey from the Northern Fleet to its permanent base with the Pacific Fleet on the Kamchatka Peninsula. It is anticipated that the changeover would span two weeks. It was noted that "Generalissimus Suvorov" moved from Severodvinsk to a temporary basing with the Northern Fleet in January 2023. The Northern Sea Route is often used in the summer for the movement of new submarines to the Pacific Fleet.

The "Generalissimus Suvorov" was built by the Central Design Bureau for Marine Engineering "Rubin" in St. Petersburg. It is a member of the enhanced "Borei-A" project's fourth generation of nuclear submarines. The project includes entirely new technological approaches, improved tools, lower physical field levels, higher safety, and major import substitution efforts. When surfaced, the submarine can carry 14,720 tonnes (14,488 long tonnes), and when submerged, it can carry 24,000 tonnes (23,621 long tonnes). With a length of 170 metres (557 feet 9 inches), a beam of 13.5 metres (44 feet 3 inches), and a draught of 10 metres (32 feet 10 inches), she is 44 feet 3 inches in height.

The submarine's propulsion system consists of a single OK-650B nuclear reactor that fuels an AEU steam turbine that turns a single shaft. The submarine can go at 25 knots (46 km/h; 29 mph) because to its configuration. For her offensive prowess, the submarine is armed with 16 R-30 *Bulava* SLBMs. She also has six 21-inch (533-mm) torpedo tubes.

Previously, in July, Russian Navy Commander-in-Chief Admiral Nikolai Evmenov said that the Russian Navy will deploy the nuclear submarine Belgorod, the carrier of the *Poseidon* underwater nuclear drones, in 2023. The experimental Poseidon drone boat

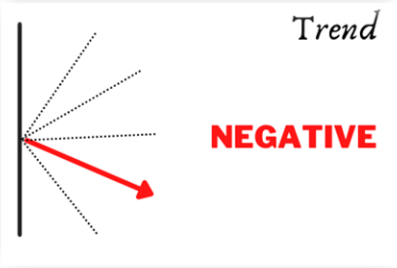
"Belgorod" was launched in April 2019 at Sevmash and is a multi-purpose nuclear submarine. 2018's Federal Assembly speech by President Vladimir Putin contained the first announcement of Poseidon's development. He claims that these drones are capable of carrying both conventional and nuclear missiles, allowing them to strike a variety of targets, including as infrastructure, coastal defences, and groups of aircraft carriers.

Alexei Rakhmanov, president and chief executive officer of Russia's United Shipbuilding Corporation (USC), stated in an interview on August 14, 2023, that Russia is preparing to equip its new nuclear submarines with hypersonic *Zircon* missiles. He stated that the Zircons will be equipped with multipurpose nuclear submarines from the *Yasen-M* programme. In an effort to upgrade the army and fleet, the Yasen-class submarines, also known as Project 885M, were created to replace Soviet-era nuclear attack submarines. It is challenging to defend against the sea-based Zircon hypersonic missiles because of their range of 900 km (560 miles) and high-top speed.

Iran

Silky Kaur

Previous Trend: Negative



On August 7, 2023, in a meeting between Japan's Foreign Minister, Yoshimasa Hayashi, and his Iranian counterpart, Mr Hossein Amir-Abdollahian, Minister Hayashi conveyed his profound concern regarding Iran's nuclear program expansion and emphasized the imperative for Iran to engage in full and unconditional cooperation with the IAEA. He underscored Japan's unwavering support for the Joint Comprehensive Plan of Action (JCPOA), the 2015 nuclear accord between Iran and global powers. Minister Amir-Abdollahian expressed Iran's commitment to seeking diplomatic avenues to reactivate the JCPOA and conveyed appreciation for Japan's diplomatic endeavors. On August 21, 2023, in a conversation with Chinese Foreign Minister Wang Yi Mr. Amir-Abdollahian, expressed hope for a “wave of reconciliation” in the Middle East.

On September 16, 2023, DG, IAEA, Rafael Grossi, condemned Iran for its decision to effectively prevent several of its most experienced inspectors from monitoring the country's nuclear program. Grossi characterized Iran's action as "disproportionate and unprecedented," as it severely hampers the IAEA's ability to oversee Iran's nuclear activities. Iran's foreign ministry justified its decision by alleging that it was a response to perceived attempts by the United States and three European nations to manipulate the IAEA for their political agendas.

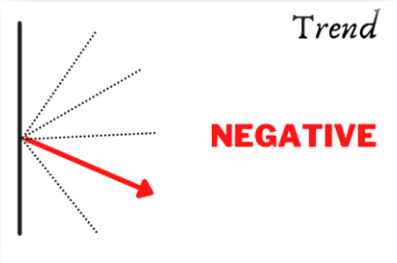
Meanwhile, in light of the significant economic sanctions imposed on Iran and considering the upcoming U.S. elections, Iran agreed to a prisoner exchange with USA. On September 18, 2023, five Iranian-US dual nationals and five Iranian nationals were released. In exchange, Tehran gained access to $6 billion of its previously frozen overseas reserves. Qatar played the chief mediator in facilitating

this arrangement and expressed the hope that it will pave the way for broader discussions and dialogue on the Iranian nuclear issue.

North Korea

Silky Kaur

Previous Trend: Negative



On August 17, 2023, at the UN Security Council, the U.S. Ambassador to the United Nations, Linda Thomas-Greenfield, strongly condemned North Korean leader Kim Jong Un for his use of "repression and brutality" and his reliance on totalitarian governance in the pursuit of illicit nuclear weapons and ballistic missile development. Also, in August 2023, the UN Secretary-General denounced the recent attempted launch of another military satellite by DPRK. He emphasized that any such launch using ballistic missile technology directly violates the pertinent resolutions of the United Nations Security Council. The G7 Foreign Ministers, representing Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States of America, along with the High Representative of the European Union, also expressed profound condemnation of North Korea's satellite launch on August 24, 2023.

On September 03, 2023, North Korea announced that it had conducted a simulated nuclear missile attack as a stark warning to the United States about the potential risks of nuclear warfare. In a further development, on September 08, 2023, North Korea claimed the launch of a new tactical nuclear attack submarine. The submarine, named "Hero Kim Kun Ok," was unveiled in a ceremony attended by North Korean leader Kim Jong Un, as the state-run Korean Central News Agency (KCNA) reported. According to KCNA, Kim Jong Un stated that the submarine is equipped with many nuclear delivery systems and possesses the capability for preemptive and retaliatory strikes against hostile nations. He also urged the country to convert its medium-sized submarines into nuclear-capable variants. However, it's worth noting that skepticism surrounds these claims, with South Korean authorities casting doubt on the submarine's functionality and capabilities.

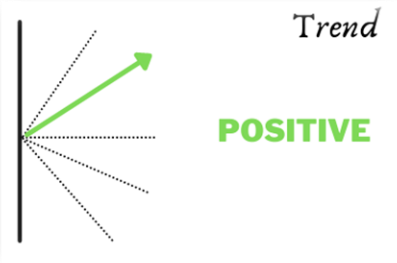
On September 16, 2023, North Korean leader Kim Jong Un, during a visit to Russia, inspected Russian military assets, including nuclear-capable strategic bombers, hypersonic missiles, and warships. The Russian defense minister showcased several critical components of their military arsenal, notably the Tu-160, Tu-95, and Tu-22M3 strategic bombers, which have the capacity to carry nuclear weapons. The growing cooperation between Russia and North Korea has raised concerns among the United States and South Korea that this alliance could potentially grant Kim access to sensitive Russian missile technology and other military resources while also assisting Russia in its ongoing conflict in Ukraine. South Korea's president addressed this issue during a high-level U.N. General Assembly meeting on September 20, 2023. He emphasized that the international community must respond decisively to the deepening military collaboration between Russia and North Korea. He also stated that if Russia were to support North Korea in enhancing its weapons programs in exchange for assistance in the Ukraine conflict, it would be viewed as a direct provocation. In such a scenario, Seoul and its allies would not remain passive observers but would take necessary measures to safeguard their interests and security.

Nuclear Energy

Rishika Singh

Dhruba Tara Singh

Previous Trend: Positive



The trend for nuclear energy remained positive for the third quarter of 2023. At the G-20 energy ministers' conference held on July 22, 2023, global collaboration in the sphere of nuclear energy was observed. Nuclear power, particularly small modular reactors, was extensively highlighted. The countries showed interest to cooperate in research, innovation, development, and deployment of civil nuclear technology, including advanced and small modular reactors, on a voluntary and mutually agreed-upon basis.

On July 14, 2023, **Pakistan** Prime Minister Shehbaz Sharif inaugurated the 1200-megawatt nuclear power facility in Punjab province, which is being built with Chinese assistance. Earlier, Prime Minister Sharif signed a $3.5 billion deal with China under which Beijing will construct the Chashma-V nuclear reactor in the Punjab region of Mianwali. In Japan, on September 15, 2023, Kansai Electric Power Company announced that Unit 2 was restarted. The Takahama nuclear power station in **Japan's** Fukui Prefecture has been restarted after being shut down for more than a decade. The pressurised water reactor with a capacity of 780 MWe (net) is the 12th Japanese reactor to restart operations.

Ukraine's Energoatom and the US corporation Westinghouse signed a memorandum of understanding (MoU) on September 12, 2023, pertaining to the development and deployment of AP300 small modular reactors (SMRs) in Ukraine. The firms have agreed to expand their collaboration in the building of nine planned AP1000 units in the country. On September 12, 2023, a memorandum of understanding (MoU) signed by the Polish business Orlen Synthos Green Energy (OSGE) and the Emirates Nuclear Energy Corporation (ENEC) will see the parties collaborate to promote

decarbonisation efforts in **Poland** by investing in small modular reactors (SMRs). The OSGE intends to construct and operate Poland's first SMR power station before the end of the decade.

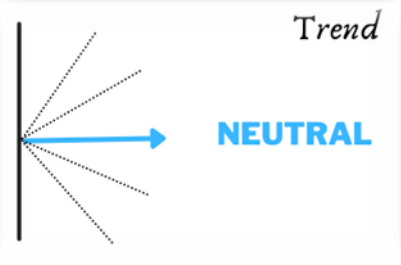
The **Rwandan** government inked a deal with Dual Fluid Energy Inc, a Canadian-German nuclear energy business, to work on the construction of a test nuclear power reactor in Rwanda on September 13, 2023. According to a joint statement, the "demonstration Dual Fluid nuclear reactor" is projected to be operational by 2026, with additional testing of the Dual Fluid technology to be completed by 2028. On August 08, 2023, the government of **Uganda** has declared that it will work independently with Russia and South Korea to develop two nuclear power reactors in the country.

The **Canadian** government granted CAD74 million (USD55 million) in federal financing for small modular reactor (SMR) development in Saskatchewan on August 19, 2023. The investment, which includes almost CAD24 million from the earnings of Canada's pollution pricing system, will be used to progress the project, which is being led by utility SaskPower.

Nuclear Security

Prachi Lokhande

Previous Trend: Neutral



In an update of 15th September, 2023, IAEA director general underlined the potential dangers for nuclear safety and security in the context of the ongoing conflict in Ukraine. The IAEA experts noted explosions some distance away from the Zaporizhzhia Nuclear Power Plant, in a possible indication of increased military activity in the region although there was no damage to the plant. The six reactor units of the ZNPP remain in shutdown, with units 1 to 5 in cold shutdown and unit 6 in hot shutdown to generate steam for various nuclear safety functions. IAEA was informed by the ZNPP about drone attacks on 11 September in the nearby city of Enerhodar, causing minor damage to two buildings. Japan's release of treated water into the sea at Fukushima raised eyebrows around the world. But, according to the IAEA, the water released is consistent with international safety standards. In a report formally presented by Director General Grossi to Japanese Prime Minister Fumio Kishida in Tokyo, the IAEA also said that the discharges of the treated water would have a negligible radiological impact to people and the environment. The report is the outcome of nearly two years of work by an IAEA Task Force made up of top specialists from within the Agency advised by internationally recognised nuclear safety experts from eleven countries. South Korea has also endorsed the safety of Japan releasing treated wastewater from Fukushima plant. Seoul's assessment was based on a 22-month review by government-funded scientists and aligned with the IAEA's views.

An international conference on computer security in the nuclear world was held in Vienna to discuss effective security measures to protect against cyber-attacks on facilities handling nuclear or other radioactive material in an increasingly digitized world. IAEA DG addressed the conference calling it of utmost importance with the rise of challenges posed by the malicious use of digital tools. The IAEA has developed

computer security exercises for nuclear power plants and radiological facilities, which have been carried out at a national level in some countries to practise and prepare for a worst-case scenario of a breach of cybersecurity at a nuclear facility. IAEA's nuclear security guidance on computer security also provides an essential resource that can enable countries to put important computer security measures in place to detect, prevent and respond to cyberattacks.

The Nuclear Threat Initiative's Nuclear Security Index reported a regression in nuclear security conditions among countries and areas with weapons-usable nuclear materials and nuclear facilities. This erosion of nuclear security comes at a time when risk environments are growing more dangerous and overall stockpiles of weapons-usable nuclear materials are increasing at an alarming rate. "The bottom line is that the countries and areas with the greatest responsibility for protecting the world from a catastrophic act of nuclear terrorism are derelict in their duty," the 2023 NTI Index reports. "This is a particularly disheartening development with geopolitical and economic instability, violent non-state actors, environmental disasters, and cyber-attacks all on the rise."

The International Conference on Nuclear Security (ICONS 2020) was convened to formulate and exchange views on experiences and achievements, current approaches, future directions and priorities for nuclear security with more than 1900 participants from 141 Member States, four non-Member States and 25 international organizations. A ministerial declaration reaffirming support for nuclear security was adopted by consensus at ICONS 2020.

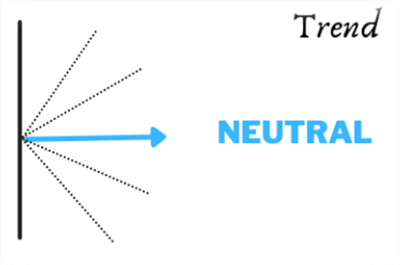
Negotiations with Iran stalled owing to suspected increase in Iran's uranium stockpile. Stalled efforts to restore implementation of the Joint Comprehensive Plan of Action have been complicated further by allegations that Iran transferred unmanned aerial vehicles to the Russian Federation. IAEA estimates that Iran has an enriched-uranium stockpile of more than 20 times the allowable amount under the Plan.

The IAEA has completed its first International Physical Protection Advisory Service (IPPAS) mission to Zambia at the request of the government. The 12-day mission, hosted by Zambia's Radiation Protection Authority (RPA), reviewed the nuclear security regime with regard to the security of radioactive material, associated facilities and activities, including transport.

Nuclear Non- proliferation & Disarmament

Manpreet Sethi

Previous Trend: Neutral



On 26 July 2023, **Sri Lanka** became the 178th country to ratify the CTBT. The Geological Survey and Mines Bureau would be the focal point in Sri Lanka for data transmission with the International Data Centre of CTBTO. Sri Lanka operates an auxiliary seismic station as part of this network. It had first signed the treaty on 24 Oct 1996. Ratification now allows the country to engage in decision making discussions and consultations.

On July 31, 2023, the **United States** issued a press release reaffirming its dedication to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). Led by the Special Representatives of the President for Nuclear Nonproliferation, Adam Scheinman, the United States actively participated in the 2023 Preparatory Committee Meeting (PrepCom) held in Vienna, along with other NPT States Parties. The primary objectives of this meeting were to address the pressing challenges confronting the nonproliferation regime and to further enhance the NPT's effectiveness.

Speaking at the UN General Assembly on September 2023, President Biden condemned the Putin regime for its decision to suspend the 2010 New Start treaty earlier this year, which had been the last remaining arms control agreement between the United States and Russia. He also highlighted Russia's withdrawal from the Conventional Forces in Europe treaty in 2007, characterizing these actions as irresponsible and detrimental to global security. President Biden affirmed the United States' commitment to leadership in curbing the proliferation of weapons of mass destruction. He emphasized that the U.S. would continue to actively engage in sincere efforts to reduce the threat posed by such weapons and would set an example for the international community, regardless of the global circumstances. During the annual United Nations leaders' week on September 19, 2023, two additional countries made significant moves supporting the Treaty on the Prohibition of Nuclear

Weapons (TPNW). This development has increased the number of signatories to 93, representing nearly half of all the states globally. Furthermore, the number of States Parties has reached 69. The Foreign Minister of the **Bahamas** officially signed the landmark accord, demonstrating the country's commitment to the treaty. Simultaneously, **Sri Lanka**'s Minister acceded to the TPNW in a ceremony held in New York. These actions mark a growing global consensus and momentum favoring nuclear disarmament and non-proliferation efforts.

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Centre for Air Power Studies (CAPS) was established in 2001 as an autonomous defence research and analysis body for research and focused analyses on issues related to national security, defence, and aerospace issues in the evolving strategic and international security environment. Its objective is to facilitate a greater understanding of these issues amongst the Armed Forces, the strategic community, and the public besides contributing to policy generation and decision-making.

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.