JUNE
2022

# समाचार पत्रों से चयित अंश
# Newspapers Clippings

**A Daily service to keep DRDO Fraternity abreast with DRDO Technologies, Defence Technologies, Defence Policies, International Relations and Science & Technology**


खंड : 47 अंक: 106 07 जून 2022

Vol. : 47 Issue : 106 07 June 2022




रक्षा विज्ञान पुस्तकालय
Defence Science Library
रक्षा वैज्ञानिक सूचना एवं प्रलेखन केंद्र
Defence Scientific Information & Documentation Centre
मेटकॉफ हाउस, दिल्ली - 110 054
Metcalfe House, Delhi - 110 054

# CONTENTS

**DRDO News**

**DRDO Technology News**

NBT नवभारत टाइम्स

*Mon, 06 Jun 2022*

# भारत ने अग्नि-4 मिसाइल का किया सफल परीक्षण, दुश्मनों की बढ़ी धुकधुकी

भारत ने सोमवार को ओडिशा के ए पी जे अब्दुल कलाम द्वीप से मध्यम दूरी की बैलिस्टिक मिसाइल अग्नि-4 का कामयाब परीक्षण किया। इस मिसाइल का सफल परीक्षण देश की सैन्य क्षमताओं में उल्लेखनीय बढ़ोतरी का प्रतीक है। रक्षा मंत्रालय ने बताया कि परीक्षण शाम करीब साढ़े सात बजे किया गया। अग्नि-4 का सफल परीक्षण भारत की 'विश्वसनीय न्यूनतम प्रतिरोधक क्षमता' की नीति की पुष्टि करता है।मंत्रालय के अनुसार, 'मध्यम-रेंज की बैलिस्टिक मिसाइल अग्नि-4 का सफल परीक्षण सोमवार को शाम लगभग साढ़े सात बजे ए पी जे अब्दुल कलाम द्वीप ओडिशा से किया गया।'

मंत्रालय ने कहा कि परीक्षण ने सभी परिचालन मानकों के साथ-साथ प्रणाली की विश्वसनीयता को भी साबित किया। बयान में कहा गया, 'सफल परीक्षण 'विश्वसनीय न्यूनतम प्रतिरोध' क्षमता रखने की भारत की नीति की पुष्टि करता है।'

*https://navbharattimes.indiatimes.com/india/india-successfully-test-fired-agni-4-missile/articleshow/92043806.cms*

Press Information Bureau
Government of India

**Ministry of Defence**

***Mon, 06 Jun 2022 8:25 PM***

# Intermediate Range Ballistic Missile, Agni-4, successfully tested

A successful training launch of an Intermediate Range Ballistic Missile, Agni-4, was carried out at approximately 1930 hours on June 06, 2022 from APJ Abdul Kalam Island, Odisha. The successful test was part of routine user training launches carried out under the aegis of the Strategic Forces Command. The launch validated all operational parameters as also the reliability of the system. The successful test reaffirms India's policy of having a 'Credible Minimum Deterrence' Capability.

*https://www.pib.gov.in/PressReleasePage.aspx?PRID=1831654*

NDTV

***Mon, 06 Jun 2022***

# Agni-IV Missile Successfully Tested, can Strike Targets 4,000 km Away

The test was a part of routine user training launches carried out under the aegis of the Strategic Forces Command, said the defence ministry. A nuclear-capable Agni-IV ballistic missile, which can strike targets 4,000 km away, was successfully test-fired off the Odisha coast today, marking a significant boost to the country's military capabilities. The test was a part of routine user training launches carried out under the aegis of the Strategic Forces Command, said the Defence Ministry. "The successful test reaffirms India's policy of having a credible minimum deterrence capability," it said in a statement. The missile was test-fired off APJ Abdul Kalam Island in Odisha at 7.30 pm this evening.

The government said the launch validated all operational parameters as also reliability of system. Agni-IV is the fourth in the Agni series of missiles - earlier known as Agni II prime - developed by the Defence Research and Development Organisation or DRDO. Last year, India successfully test-fired the nuclear-capable strategic Agni Prime missile with the capability to hit targets between 1,000 to 2,000 kilometres. India is in the process of further strengthening its strategic missiles arsenal by adopting newer technologies and capabilities.

*https://www.ndtv.com/india-news/nuclear-capable-agni-iv-ballistic-missile-successfully-tested-3043500*

# DRDO On Twitter

DRDO
@DRDO_India

#DRDOUpdates | ARDE-Pune under the aegis of ARB ,#DRDO conducted one day brainstorming session with senior scientists, academicians & #industry partners to analyse the emerging trends in #defence tech, systems & frameworks in #futuristic warfare-users, cyber security, AI etc.

6:27 PM · Jun 6, 2022 · Twitter Web App

# Defence News

# Defence Strategic: National/International

पत्र सूचना कार्यालय
भारत सरकार

**रक्षा मंत्रालय**

***Mon, 06 Jun 2022 4:30 PM***

## रक्षा मंत्री श्री राजनाथ सिंह की अध्यक्षता में रक्षा खरीद परिषद ने 'आत्मनिर्भर भारत' को बढ़ावा देने के लिए 76,390 करोड़ रुपये के रक्षा सौदों को मंजूरी दी

प्रधानमंत्री श्री नरेन्द्र मोदी के 'आत्मनिर्भर भारत' के आह्वान के बाद रक्षा मंत्री श्री राजनाथ सिंह की अध्यक्षता में रक्षा खरीद परिषद (डीएसी) ने 06 जून, 2022 को एक बैठक में 76,390 करोड़ रुपये की राशि

सशस्त्र बलों के लिए पूंजी अधिग्रहण प्रस्तावों में प्रयोजन की स्वीकृति (एओएन) को मंजूर किया। इन्हें 'खरीदें (भारतीय)', 'खरीदें और बनाएं (भारतीय)' और 'खरीदें (भारतीय-आईडीडीएम)' श्रेणियों के अंतर्गत स्वीकार किया गया है। इससे भारतीय रक्षा उद्योग को पर्याप्त बढ़ावा मिलेगा और विदेशी खर्च में मुख्य रूप से कमी आएगी। रक्षा खरीद परिषद ने स्वदेशी डिजाइन और विकास पर जोर देने के साथ ही घरेलू स्रोतों के माध्यम से भारतीय सेना के लिए रफ टेरेन फोर्क लिफ्ट ट्रक (आरटीएफएलटी), ब्रिज लेइंग टैंक (बीएलटी), व्हीलड आर्मर्ड फाइटिंग व्हीकल्स (डब्ल्यूएच एएफवी) के अतिरिक्त एंटी-टैंक गाइडेड मिसाइल (एटीजीएम) और वेपन लोकेटिंग रडार (डब्ल्यूएलआर) की खरीद के लिए नए एओएन को स्वीकृति प्रदान की।

भारतीय नौसेना के लिए डीएसी ने लगभग 36,000 करोड़ रुपये की अनुमानित लागत पर अगली पीढ़ी के कार्वेट (एनजीसी) की खरीद के लिए एओएन को मंजूरी दी। ये एनजीसी निगरानी मिशन, एस्कॉर्ट ऑपरेशन, डिटरेंस, सर्फेस एक्शन ग्रुप (एसएजी) ऑपरेशंस, तलाश एवं आक्रमण और तटीय सुरक्षा जैसी विभिन्न भूमिकाओं के लिए बहुउद्देश्यीय प्लेटफॉर्म साबित होंगे। इन एनजीसी का निर्माण भारतीय नौसेना के नए इन-हाउस डिजाइन के आधार पर जहाज निर्माण की नवीनतम तकनीक का उपयोग करके किया जाएगा और यह कदम सरकार की सागर (क्षेत्र में सभी के लिए सुरक्षा और विकास) पहल को आगे बढ़ाने में योगदान देगा। डीएसी ने विशेष रूप से स्वदेशी एयरो-इंजन सामग्री में स्वदेशीकरण को बढ़ाने पर ध्यान देने के साथ नवरत्न सीपीएसई मेसर्स हिंदुस्तान एयरोनॉटिक्स लिमिटेड द्वारा डोर्नियर एयरक्राफ्ट और एसयू -30 एमकेआई एयरो-इंजन के निर्माण के लिए एओएन प्रदान किया।

रक्षा क्षेत्र में डिजिटल परिवर्तन के लिए सरकार के दृष्टिकोण के अनुसरण में 'खरीदें (भारतीय) श्रेणी' के तहत 'डिजिटल तटरक्षक' परियोजना को डीएसी द्वारा अनुमोदित किया गया है। इस परियोजना के तहत, तटरक्षक बल में विभिन्न सतही और विमानन संचालन, रसद, वित्त एवं मानव संसाधन प्रक्रियाओं के डिजिटलीकरण के लिए एक अखिल भारतीय सुरक्षित नेटवर्क स्थापित किया जाएगा।

*https://www.pib.gov.in/PressReleasePage.aspx?PRID=1831636*

Press Information Bureau
Government of India

**Ministry of Defence**

***Mon, 06 Jun 2022 4:30 PM***

# Defence Acquisition Council, Headed by Raksha Mantri Shri Rajnath Singh, Clears Proposals Worth Rs 76,390 Crore, In Major Boost to 'Aatmanirbhar Bharat'

Following Prime Minister Shri Narendra Modi's clarion call for 'Aatmanirbharta', Defence Acquisition Council (DAC), in a meeting chaired by Raksha Mantri Shri Rajnath Singh on June

06, 2022, accorded Acceptance of Necessity (AoN) for Capital Acquisition Proposals of the Armed Forces amounting to Rs 76,390 crore under 'Buy (Indian)', 'Buy & Make (Indian)' and 'Buy (Indian-IDDM)' categories. This will provide substantial boost to the Indian Defence Industry and reduce foreign spending significantly. For the Indian Army, the DAC accorded fresh AoNs for procurement of Rough Terrain Fork Lift Trucks (RTFLTs), Bridge Laying Tanks (BLTs), Wheeled Armoured Fighting Vehicles (Wh AFVs) with Anti-Tank Guided Missiles (ATGMs) and Weapon Locating Radars (WLRs) through domestic sources with emphasis on indigenous design and development.

For the Indian Navy, the DAC accorded AoN for procurement of Next Generation Corvettes (NGC) at an estimated cost of approx. Rs 36,000 crore. These NGCs will be versatile platforms for variety of roles viz. surveillance missions, escort operations, deterrence, Surface Action Group (SAG) operations, Search & Attack and Coastal Defence. These NGCs would be constructed based on new in-house design of Indian Navy using latest technology of ship building and would contribute to further the Government's initiative of SAGAR (Security and Growth for all in the Region). The DAC accorded AoNs for manufacture of Dornier Aircrafts and Su-30 MKI aero-engines by the Navratna CPSE M/s Hindustan Aeronautics Limited with focus on enhancing indigenisation particularly in indigenising aero-engine material.

In pursuance of the Government's vision for digital transformation in Defence, 'Digital Coast Guard' project under 'Buy (Indian) Category has been approved by the DAC. Under this project, a pan India secure network for digitising of various surface and aviation operations, logistics, finance and HR processes in Coast Guard will be established.

*https://www.pib.gov.in/PressReleasePage.aspx?PRID=1831550*

Hindustan Times

***Mon, 06 Jun 2022***

# Defence Ministry Approves Rs. 76,390 Crore Proposal to buy India-Made Arms, Ammunitions

The procurement includes rough terrain forklift trucks, bridge laying tanks, wheeled armoured fighting vehicles with anti-tank guided missiles and weapon locating radars through domestic sources with emphasis on indigenous design and development - for the Indian Army. The Defence Acquisition Council (DAC), which met on Monday under the chairmanship of defence minister Rajnath Singh, accorded acceptance of necessity (AoN) for capital acquisition proposals of the armed forces worth Rs.76,390 crore under 'Buy (Indian)', 'Buy & Make (Indian)' and 'Buy (Indian-IDDM)' categories - giving a major boost to 'the Aatmanirbhar Bharat' campaign.

These include procurement of rough terrain forklift trucks, bridge laying tanks, wheeled armoured fighting vehicles with anti-tank guided missiles and weapon locating radars through domestic sources with emphasis on indigenous design and development - for the Indian Army. "For the Indian Navy, the DAC accorded AoN for procurement of next-generation corvettes (NGCs) at an estimated cost of approx Rs. 36,000 crore. These NGCs will be versatile platforms for a variety of roles viz. surveillance missions, escort operations, deterrence, surface action

group (SAG) operations, search and attack and coastal defence," a defence ministry statement said. It added that these NGCs would be constructed based on the new in-house design of the Indian Navy using the latest technology of shipbuilding and would contribute to further the government's initiative of "SAGAR (security and growth for all in the region)".

The DAC also accorded AoNs for the manufacture of Dornier aircraft and Su-30 MKI aero-engines by the Navratna CPSE M/s Hindustan Aeronautics Limited with a focus on enhancing indigenisation, particularly in indigenising aero-engine material. "In pursuance of the Government's vision for digital transformation in Defence, the 'Digital Coast Guard' project under 'Buy (Indian) Category has been approved by the DAC. Under this project, a pan India secure network for digitising of various surface and aviation operations, logistics, finance and HR processes in Coast Guard will be established," the statement added.

*https://www.hindustantimes.com/india-news/defence-ministry-clears-76-390-cr-proposal-to-buy-india-made-arms-ammunitions-101654516035914.html*

The Tribune

*Tue, 07 Jun 2022*

# Defence Acquisition Council Okays 8 New Warships for Navy, Special Vehicles for Army

The Defence Acquisition Council (DAC), headed by Defence Minister Rajnath Singh, on Monday okayed making eight new warships, surveillance planes, new vehicles for war fighting in the Himalayas and has asked Hindustan Aeronautics Limited (HAL) to focus on indigenous making of aero-engine manufacturing. The DAC is the apex decision making body of the Ministry of Defence and is chaired by the Defence Minister. The DAC has accorded acceptance of necessity (AoN) for the procurement of next generation corvettes (NGC) at an estimated cost of Rs 36,000 crore. The AoN is the first step for the procurement procedure. These next generation corvettes are part of the Indian Navy's ongoing plan to have a 175-ship Navy. The warships, the NGC, will be versatile platforms for variety of roles like surveillance missions, escort operations, deterrence, surface action group (SAG) operations, search and attack and coastal defence. These NGCs would be constructed based on new in-house design of Indian Navy using latest technology of ship-building.

The DAC also accorded AoNs for the manufacture of Dornier aircrafts and Su-30 MKI aero-engines by HAL, with focus on enhancing indigenisation, particularly in indigenising aero-engine material. The Dornier's will be modified for a role in surveillance and intelligence gathering.

**DAC okays AoNs for capital acquisition**

Proposals of the armed forces amounting to Rs 76,390 crore were accorded at the meeting. All the equipment will be sourced locally. For the Army, the DAC has accorded fresh AoNs for procurement of Rough Terrain Fork Lift Trucks (RTFLTs), Bridge-Laying Tanks (BLTs), Wheeled. Armoured Fighting Vehicles with Anti-Tank Guided Missiles (ATGMs) and Weapon-Locating Radars (WRs) through indigenous sources, with emphasis on indigenous design and

development. In pursuance of the government's vision for digital transformation in defence, "Digital Coast Guard" Project under the 'Buy (Indian) Category' has been approved by the DAC. Under this project, a pan India secure network for digitising various surface and aviation operations, logistics, finance and HR processes in the Indian Coast Guard will be established.

*https://www.tribuneindia.com/news/nation/defence-acquisition-council-okays-8-new-warships-for-navy-special-vehicles-for-army-401521*

THE NEW INDIAN EXPRESS

***Mon, 06 Jun 2022***

# Security Forces Alert to Threat of Drones from Across Border: BSF Officer

Threat of drones were present everywhere along the Indo-Pakistan border but security forces are alert to foil any nefarious design from across the border and to ensure the protection of the people. The threat of drones is present everywhere along the Indo-Pakistan border but security forces are alert to foil any nefarious design from across the border in the region, a senior Border Security Force (BSF) said on Monday. He said that Army and BSF are fully dominating the Line of Control (LoC) to ensure the protection of the people along the frontier. "The threat of drones is prevalent everywhere (along the Indo-Pak border). Nobody can say that there is no such threat in Rajouri or Poonch or any hinterland," the Deputy Inspector General (DIG) of the BSF Rajouri Poonch sector, D S Sindhu, told reporters at a function in Rajouri.

"There is a threat of drones in all areas along our borders," he said replying to queries on the issue. He said that troops are alert along the borderline to protect the people living in border areas. He said that troops have deployed to instill a feeling of security among the border population. "Army and BSF are dominating the Line of Control in a proper manner to thwart any nefarious design of our adversaries," Sindhu said. He noted that advanced courses are conducted regularly to upgrade the skills of the jawans. The DIG inaugurated a skill development program at Sector Headquarters Rajouri.

*https://www.newindianexpress.com/nation/2022/jun/06/security-forces-alert-to-threat-of-drones-from-across-border-bsf-officer-2462511.html*

FINANCIAL EXPRESS Read to Lead

***Mon, 06 Jun 2022***

# Hyper Claims About Hypersonic?

***By Girish Linganna***

When the world heard the claims of Russia test-firing the 3M22 Zircon hypersonic non-ballistic missile and its capabilities in the last week of May, America tried to pooh-pooh it. When

Moscow said it had fired two hypersonic missiles in Ukraine, the Pentagon said it was not a "game changer". Still, a question popped up – whether India is also equipped with such a missile? Can India be quiet when the US, Russia, and China have already boasted of these advanced technologies? It has no choice but to join the race with next-generation weaponry. It is making preparations for the same.

Russia showed off its hypersonic missile Zircon to send a message to the West, in particular, America, that it can teach a lesson or two if it continues to fortify Ukraine with more weapons. It is also a message to the members of NATO that they are not in a safe zone. Of course, the test firing of the anti-ship hypersonic cruise missile, Zircon (also referred to as Tsirkon), did not come as a bolt from the blue because Vladimir Putin's devious mindset is well known to the world. He is capable of using and also exhausting all possibilities to tame the West through Ukraine. One such test is the test-fire of the hypersonic missile. It is part of the experiment that has been going on since 2020. It was reported in 2019 that the Russian Navy may accept the Zircon for service and deploy it on surface warships and submarines from 2023. But the timing of the latest test-fire is such that it sends a strong warning to those who are standing by Ukraine now. It also looks like Russia is trying to advance its deployment to the end of 2022. The TASS news agency of Russia has reported that the Admiral Golovko frigate would become the first to be armed full-time with the Zircon.

The Zircon missile is considered a lethal weapon that is being developed. It was launched in the Barents Sea in the Arctic, hitting a practice target in the White Sea, off Russia's northwest coast. The distance it travelled was 1,000 km. To support the claims, a 30-second video was released along with a statement. Zircon is famed for being the world's fastest non-ballistic missile. It can carry both a conventional and a nuclear warhead. These are the claims of Russia. A hypersonic missile is supposed to travel at no less than Mach 5 or much higher. It means it travels five times faster than the speed of sound. Putin has claimed that the Zircon can fly on March 9 – nine times the speed of sound, covering a range of 1,000 km. In other words, the missiles can directly target the chosen destination from a long distance. On top of that, they can't be intercepted by any current missile defence system, which is the claim by Russia.

Defence experts do believe that the Zircon is a highly expensive missile. Each one could cost around $210 million. No doubt, they can be used on battlefields like Ukraine to destroy underground targets. Such technically advanced missiles have higher penetration and damage as well as greater destructive power. Because of its maneuverable ability, it is almost impossible to track. Moscow's stated aim is to empower its cruisers, submarines, and frigates with the Zircon. It may give a miss to even the most advanced aircraft in the world, such as the US's Aegis Combat System, because of its super speed. But can Russia afford to use such an expensive weapon now? This question arises because it is choked with too many western economic sanctions. Vladimir may not like to use missiles like rockets because a vast area of Ukraine has already been bombarded and people have dispersed.

The United States Air Force has stated that it has successfully tested a hypersonic weapon with a Mach 5 speed in March 2022. In August 2021, in China a test of a nuclear-capable hypersonic missile was conducted. It launched a rocket that carried a hypersonic glide vehicle that flew in low-orbit space, it has been reported. In April, the AUKUS – an alliance between the US, UK, and Australia – announced plans to work together to develop hypersonic missiles. This is mainly to equip them to face China's growing military power in the Pacific region. To the solace of the US, China recently made a vain bid to reach a consensus on a security pact among the 10 Pacific

Island nations. President David Panuelo of the Federated States of Micronesia (FSM) said that China's efforts may threaten to bring a new Cold War and World War. So, the US, Russia, and China already have hypersonic missiles that cannot be intercepted by any current missile system. These countries are in a race to modernise their defence forces. An unnamed source in the US military claimed that Russia has used hypersonic missiles multiple times in Ukraine. India might have lagged behind the US, China, and Russia when it comes to developing hypersonic missiles. But it is there. In September 2020, the Defence Research & Development Organisation (DRDO) successfully tested a Hypersonic Technology Demonstrated Vehicle (HSTDV). The country has developed its own cryogenic engine. It has adopted hypersonic air-breathing scramjet technology. To explain it in simple terms, air-breathing vehicles use air captured from the atmosphere to achieve sustained propulsion. A scramjet engine is an improvised version of the ramjet engine. While a scramjet operates at hypersonic speeds, a ramjet functions at supersonic speeds of around Mach 3.

In the HSTDV case, the cruise vehicle moved at a velocity of six times the speed of sound – that is, about 02 km/second for more than 20 seconds, according to the Ministry of Defence. It reached an altitude of over 30,000 ft in just about 20–22 seconds. With this indigenously-developed technology, India joined the league of the US, Russia, and China in possessing technology that can escape detection by interceptors. America, China, Russia, North Korea, and India have demonstrated their "hypersonic missiles," or at least they have claimed the abilities of the missiles. But are they hypersonic? No third-party endorsement has been done to assess the speed and maneuvering capabilities (both vertical and horizontal). When a missile's speed exceeds Mach 5 (five times the speed of sound), then it is said to be at "hypersonic speed." It is a difficult and costly technology because of the speed involved in it and the massive heat generated when it flies. While every country claims speed, maneuverability is not being discussed. All countries have controlled or opaque features on their hypersonic missiles. Barring the scientific community and aviation technical experts, it is difficult for others to understand the real strength of the missiles.

When Russia claimed that it destroyed a Ukrainian ammunition depot with hypersonic missiles, the West debunked the claims, saying they were nothing but hypersonic hype. Russia has claimed that its missiles can fly five to 25 times the speed of sound. Defence experts have wondered why such super-sophisticated ammunition is required to destroy a building from a short range. It is more of Putin's bragging about his military strength to the world, it was said. Why is the conflict still ongoing if the most advanced missiles have been used against Ukraine?

For now, many of the pertinent questions remain so for now because the arms race is on. More than logic, it is fear that is working. Defence Minister Rajnath Singh in December 2021 directed the DRDO to fast-track arsenal manufacturing. It may take at least four to five years to get the hypersonic missiles on board. Singh hopes that developing hypersonic cruise missiles will be a revolutionary step in India's defence sector. During the HSTDV test fire, the speed was at Mach 6 and travelled for just 23 seconds, while America and Russia are talking about Mach 9 speed. The ramjet-powered BrahMos supersonic cruise missiles of the Indian armed forces fly at Mach 2.6 speed. This is India's joint venture with Russia. India has a long way to go before it can say confidently that its indigenously designed hypersonic missiles can make space for itself in the arms race. It is a constant quest, pressure, and investment of huge money to come up with missiles with enhanced abilities.

*https://www.financialexpress.com/defence/hyper-claims-about-hypersonic/2550494/*

*Mon, 06 Jun 2022*

# उत्तर कोरिया को जवाब, अमेरिका और दक्षिण कोरिया ने किया मिसाइल परीक्षण

**उत्तर कोरिया ने पश्चिमी तथा पूर्वी तटीय क्षेत्रों और प्योंगयांग के उत्तर तथा उसके पास के** 2 **अंतर्देशीय क्षेत्रों सहित** 4 **अलग-अलग स्थानों से** 35 **मिनट में छोटी दूरी की** 8 **मिसाइल का प्रक्षेपण किया था**. अमेरिका और दक्षिण कोरिया की सेनाओं ने उत्तर कोरिया के मिसाइल परीक्षण के जवाब में सोमवार को आठ बैलिस्टिक मिसाइल को समुद्र में प्रक्षेपित किया. दक्षिण कोरिया के ज्वाइंट चीफ्स ऑफ स्टाफ और यूएस फोर्सेज कोरिया के अनुसार, अभ्यास में आठ 'आर्मी टैक्टिकल मिसाइल सिस्टम' मिसाइल शामिल थीं. इनमें से एक अमेरिका और सात दक्षिण कोरिया की मिसाइल थीं.

दक्षिण कोरिया की सेना ने कहा कि इस मिसाइल प्रक्षेपण का उद्देश्य उत्तर कोरिया के हमलों का तेजी से और सटीक जवाब देने की क्षमता का प्रदर्शन करना था. सेना ने रविवार को कहा था कि उत्तर कोरिया ने पश्चिमी तथा पूर्वी तटीय क्षेत्रों और राजधानी प्योंगयांग के उत्तर तथा उसके पास के दो अंतर्देशीय क्षेत्रों सहित कम से कम चार अलग-अलग स्थानों से 35 मिनट में छोटी दूरी की आठ मिसाइल का प्रक्षेपण किया था. उत्तर कोरिया का 2022 में यह 18वां मिसाइल परीक्षण था.

**परमाणु शक्ति के रूप में अपने देश की स्थिति को मजबूत करना**

दक्षिण कोरिया और अमेरिका के अधिकारियों का कहना है कि उत्तर कोरिया सितंबर 2017 से अपना पहला परमाणु परीक्षण करने की तैयारी कर रहा है, क्योंकि उसके नेता किम जोंग-उन का मकसद परमाणु शक्ति के रूप में अपने देश की स्थिति को मजबूत करना और प्रतिद्वंद्वियों से रियायतें हासिल करने के वास्ते दबाव बनाना है. दक्षिण कोरिया के राष्ट्रपति यून सुक येओल ने सोमवार को देश के 'मेमोरियल डे' पर अपने संबोधन में कहा कि उनकी सरकार उत्तर कोरिया के बढ़ते परमाणु हथियारों तथा मिसाइल खतरे का मुकाबला करने के लिए ''मौलिक एवं व्यावहारिक सुरक्षा क्षमताओं'' को हासिल करेगी.

*https://www.abplive.com/news/world/us-and-south-korea-conducted-missile-tests-2139763*

the pioneer

*Tue, 07 Jun 2022*

# US, S Korea Fire Missiles to Sea, Matching North's Launches

The US and South Korean militaries launched eight ballistic missiles into the sea Monday in a show of force matching a North Korean missile display a day earlier that extended a provocative streak in weapons demonstrations. South Korea's Joint Chiefs of Staff said the allies' live-fire exercise involved eight Army Tactical Missile System missiles fired into South Korea's eastern waters across 10 minutes. It said the drill was aimed at demonstrating an ability to respond swiftly and accurately to North Korean attacks. The South's military on Sunday detected North Korea firing eight short-range missiles over 35 minutes from at least four different locations, including from western and eastern coastal areas and two inland areas north of and near the capital, Pyongyang, in what appeared to be a single-day record for the country's ballistic launches.

It was North Korea's 18th round of missile tests in 2022 alone - a streak that included the country's first launches of intercontinental ballistic missiles in nearly five years. South Korean and U.S. Officials also say North Korea is preparing to conduct its first nuclear test since September 2017 as leader Kim Jong Un pushes a brinkmanship aimed at cementing the North's status as a nuclear power and negotiating economic and security concessions from a position of strength. U.S. And South Korean forces conducted a similar live-fire drill following North Korea's previous ballistic launches on May 25, which South Korea's military said involved an ICBM flown on medium-range trajectory and two short-range weapons. Those tests came as Biden wrapped up his trip to South Korea and Japan, where he reaffirmed the U.S. Commitment to defend both allies.

North Korean state media have yet to comment on Sunday's launches. They came after the U.S. Aircraft carrier Ronald Reagan concluded a three-day naval drill with South Korea in the Philippine Sea on Saturday, apparently their first joint drill involving a carrier since November 2017, as the countries move to upgrade their defense exercises in the face of North Korean threats. North Korea has long condemned the allies' combined military exercises as invasion rehearsals and often countered with its own missile drills, including short-range launches in 2016 and 2017 that simulated nuclear attacks on South Korean ports and U.S. Military facilities in Japan. Hours after the North Korean launches, Japan and the United States conducted a joint ballistic missile exercise aimed at showing their "rapid response capability" and "strong determination" to counter threats, Japan's Defense Ministry said.

The United States has vowed to push for additional international sanctions if North Korea conducts a nuclear test, but the prospects for meaningful new punitive measures are dim with the U.N. Security Council's permanent members divided. Russia and China vetoed a U.S.-sponsored resolution that would have imposed additional sanctions on North Korea over its latest ballistic tests on May 25, insisting that Washington should instead focus on reviving negotiations with Pyongyang. Those talks have stalled since 2019 over disagreements in exchanging the release of crippling U.S.-led sanctions for the North's disarmament steps. Despite facing harsh challenges

at home, including a decaying economy and a COVID-19 outbreak, Kim has shown no willingness to fully surrender an arsenal he sees as his strongest guarantee of survival. His government has so far rejected the Biden administration's offers for open-ended talks and is clearly intent on converting the dormant denuclearisation negotiations into a mutual arms-reduction process, experts say.

*https://www.dailypioneer.com/2022/world/us--s-korea-fire-missiles-to-sea--matching-north-s-launches.html*

## Science & Technology News

***Mon, 06 Jun 2022***

# Mobile Communications Beyond 5G with New "Beam-Steering" Technology

A new beam-steering antenna that increases the efficiency of data transmission, and opens up frequencies for mobile communications that are inaccessible to currently used technologies has been revealed by scientists from the University of Birmingham, UK. In telecommunications, 5G is the fifth-generation technology standard for broadband cellular networks and the successor to 4G. It boasts much faster download speeds that will eventually top out at 10 gigabits per second. It also features higher bandwidth, so it is able to connect more different devices. Now, in a breakthrough that promises unprecedented data transmission efficiency for 5G mmWave applications, researchers have developed beam-steering technology for fixed base station antennas used by cellular networks.

Birmingham researchers have unveiled a new beam-steering antenna that increases the efficiency of data transmission for 'beyond 5G' – and opens up a range of frequencies for mobile communications that are inaccessible to currently used technologies. Experimental results, presented today for the first time at the 3rd International Union of Radio Science Atlantic / Asia-Pacific Radio Science Meeting, show the device can provide continuous 'wide-angle' beam steering, allowing it to track a moving mobile phone user in the same way that a satellite dish turns to track a moving object, but with significantly enhanced speeds. Devised by researchers from the University of Birmingham's School of Engineering, the technology has demonstrated vast improvements in data transmission efficiency at frequencies ranging across the millimeter wave spectrum, specifically those identified for 5G (mmWave) and 6G, where high efficiency is currently only achievable using slow, mechanically steered antenna solutions.

For 5G mmWave applications, prototypes of the beam-steering antenna at 26 GHz have shown unprecedented data transmission efficiency. The device is fully compatible with existing 5G specifications that are currently used by mobile communications networks. Moreover, the new technology does not require the complex and inefficient feeding networks required for

commonly deployed antenna systems, instead using a low complexity system that improves performance and is simple to fabricate. The beam-steering antenna was developed by Dr. James Churm, Dr. Muhammad Rabbani, and Professor Alexandros Feresidis, Head of the Metamaterials Engineering Laboratory, as a solution for fixed, base station antenna, for which current technology shows reduced efficiency at higher frequencies, limiting the use of these frequencies for long-distance transmission.

Around the size of an iPhone, the technology uses a metamaterial*, made from a metal sheet with an array of regularly spaced holes that are micrometers in diameter. An actuator controls the height of a cavity within the metamaterial, delivery micrometer movements, and, according to its position, the antenna will control the deflection of the team of a radio wave – effectively 'concentrating' the beam into a highly directive signal, and then 'redirecting this energy as desired' – whilst also increasing the efficiency of transmission. The team is now developing and testing prototypes at higher frequencies and in applications that take it beyond 5G mobile communications.

Dr. Churm commented: "Although we developed the technology for use in 5G, our current models show that our beam steering technology may be capable of 94% efficiency at 300 GHz. The technology can also be adapted for use in vehicle-to-vehicle, vehicle-to-infrastructure, vehicular radar, and satellite communications, making it good for next-generation use in automotive, radar, space, and defense applications." University of Birmingham Enterprise has filed a patent application for this next-generation beam-steering antenna technology and is seeking industry partners for collaboration, product development or licensing. The efficiency and other aspects of the underpinning technology have been subjected to the peer review process, published in respected journals, and presented at academic conferences[1,2,3,4].

Dr. Churm added: "We are assembling a further body of work for publication and presentation that will demonstrate a level of efficiency that has not yet been reported for transmission of radio waves at these challenging frequencies. The simplicity of the design and the low cost of the elements are advantageous for early adoption by industry, and the compact electronics configuration make it easy to deploy where there are space constraints. We are confident that the beam-steering antenna is good for a wide range of 5G and 6G applications, as well as satellite and the Internet of Things." *Metamaterials is the term used for materials that have been engineered to have special properties that are not found in naturally occurring materials. These properties can include the manipulation of electromagnetic waves by blocking, absorbing, enhancing, or bending waves.

*https://scitechdaily.com/mobile-communications-beyond-5g-with-new-beam-steering-technology/*