

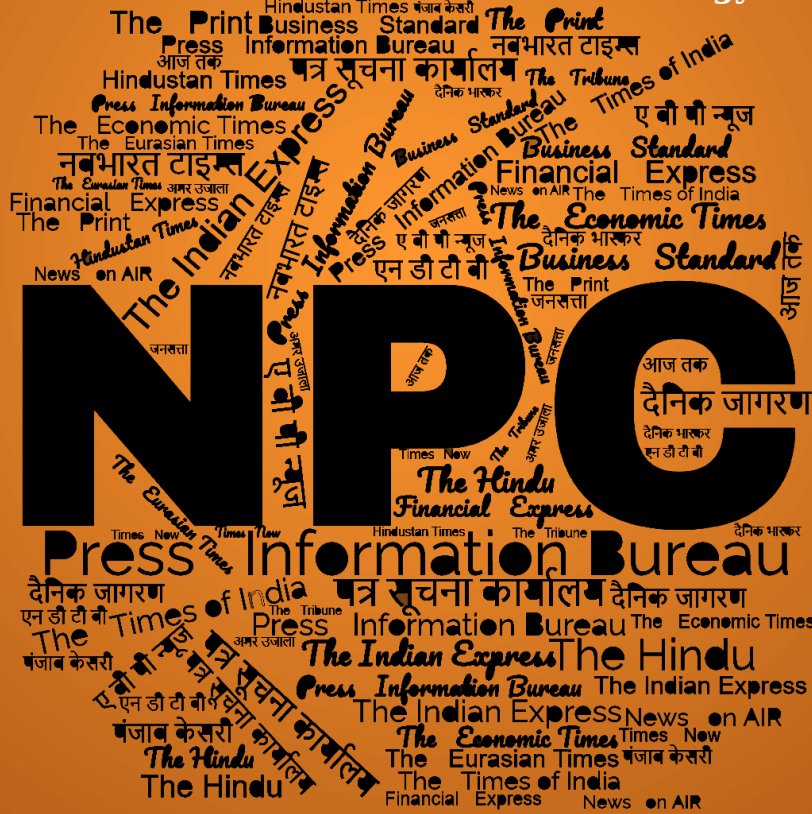
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CONTENTS

S. No.	TITLE	Page No.
DRDO News		1
DRDO Technology News		1
1.	DRDO Developing Portable Automatic Weather Stations for Airfields and Helipads Located in Remote Areas	<i>The Tribune</i> 1
2.	LRSAM: रूस के S-400 मिसाइल सिस्टम का देसी वर्जन तैयार कर रहा DRDO, दुश्मन को देगा मुंहतोड़ जवाब	<i>न्यूज़ नेशन</i> 2
3.	DRDO's Heavy Drop Parachute System' Gets Bulk Order after Successful Trials	<i>RepublicWorld.com</i> 3
Defence News		4-19
Defence Strategic: National/International		4-19
4.	Another Boost to Aatmanirbharta in Defence: DAC Approves AoN for Nine Capital Acquisition Proposals for the Armed Forces worth Rs 45,000 Crore	<i>Press Information Bureau</i> 4
5.	Maritime Information Sharing Workshop 2023	<i>Press Information Bureau</i> 5
6.	Indian Coast Guard Ship Samudra Prahari on an Overseas Deployment to ASEAN Countries as Part of India's Initiative for Marine Pollution Response in the Region	<i>Press Information Bureau</i> 7
7.	Defence Ministry Clears Proposal to Buy 'Pralay' Ballistic Missiles for Army: All you Need to Know	<i>The Times of India</i> 7
8.	Centre Clears Proposal to Buy 12 Su-30 MKI Fighter Jets	<i>The Indian Express</i> 8
9.	Indian Air Force Chief Announces Plans to Buy Around 100 More Indigenous LCA Mark 1A Fighter Jets	<i>The Economic Times</i> 9
10.	Army Likely to Complete Inducting 114 Dhanush Guns by 2026	<i>The Hindu</i> 10
11.	BrahMos Manufacturing in Lucknow Likely to Begin from March: Rajnath Singh	<i>Deccan Herald</i> 11
12.	Learning from Russia-Ukraine War, Indian Army Makes Changes in its Weapon Doctrines, Acquiring Plans	<i>Deccan Herald</i> 12
13.	Defence Startup's Nano Drones Shows Potential in Counter-Terror Operations	<i>Business Standard</i> 13
14.	Armenia Leads as First Export Customer for India's ATAGS Artillery Guns	<i>RepublicWorld.com</i> 14
15.	Catalyzing India's Air Dominance: The Rise of Nyoma Air Base in Ladakh	<i>Financial Express</i> 15
16.	Pakistan Air Force Carries out Flying Exercises in China, Egypt	<i>Deccan Herald</i> 16
17.	North Korea's Kim Jong Un Inspects Russian Bombers and Warship on a Visit to Russia's Far East	<i>The New Indian Express</i> 17
Science & Technology News		19-21
18.	Aditya-L1 Completes 4th Earth Op, to Begin Journey to Final Destination on September 19	<i>The Times of India</i> 19
19.	Chandrayaan-1 Data Suggests Electrons from Earth Forming Water on Moon	<i>The Hindu</i> 20

The Tribune

Sun, 17 Sep 2023

DRDO Developing Portable Automatic Weather Stations for Airfields and Helipads Located in Remote Areas

The Defence Research and Development Organisation (DRDO) is developing portable automatic weather stations (AWS) for use at remote airfields and helipads where there are no facilities to monitor climatic parameters.

While all regular IAF airbases have full-fledged meteorological services or fixed AWS, such facilities are not available at advance landing grounds (ALG) and helicopter operating sites located in Ladakh and the north-east.

Meteorological information such as surface temperature, wind speed and direction, humidity, atmospheric pressure, cloud cover and visibility is vital for aviation operations as these not only impact the performance of aircraft and helicopters but are also critical for flight safety, more so during take-off and landing.

According to DRDO scientists, flight operations to ALGs are not a regular basis but depend on particular requirements. ALGs are primarily unpaved airstrips or hardened mud in remote areas and have little navigation and support facilities except for possibly runway markers and a wind sock for indicating the direction and speed of the wind and a refuelling bowser and fire tender being stationed during a flight.

“Since operations to ALGs and other remote helipads are not frequent, there is no need to install permanent AWS as these will add to the maintenance effort,” a DRDO scientist said. “On the other hand, weather in the mountains can change without warning, which can affect flying. Portable AWS, which can be stored in nearby military units and deployed when needed, is an effective way to deal with this,” he added.

Daulat Beg Oldie, the highest airstrip at an altitude of 16,700 feet, Fukche and Nyoma, which has now been approved to be upgraded into a full-fledged fighter base, are ALGs located in Ladakh, while Tuting, Vijaynagar, Walong, Ziro and Tawang are among those located in the north-east. These are also numerous helipads of various sizes in high altitude areas that are used to ferry in men and equipment.

Besides helicopters, ALG’s are primarily serviced by the AN-32 tactical transporter. More recently, the C-130 Super Hercules also commenced operations to some of these strips. The C-17 Globemaster heavy lift aircraft is also capable of operating from unpaved runways.

The DRDO as well as the India Meteorological Department and the Airports Authority of India have been operating fixed AWS at many sites across India for generating weather data for scientific and operational purposes.

The portable version envisioned by DRDO is expected to be man-portable, with its sensors mounted on a collapsible stand and powered by chargeable batteries or solar panels, according to scientists. Apart from being deployed at ALGs and helipads, they can also be used in other places to meet specific operational requirements.

<https://www.tribuneindia.com/news/india/drdo-developing-portable-automatic-weather-stations-for-airfields-and-helipads-located-in-remote-areas-545244>

**NEWS
NATION**

Sun, 17 Sep 2023

LRSAM: रूस के S-400 मिसाइल सिस्टम का देसी वर्जन तैयार कर रहा DRDO, दुश्मन को देगा मुंहतोड़ जवाब

भारत अपने पड़ोसी मुल्कों के हमले को बेअसर करने के लिए खास तैयारी कर रहा है. भविष्य में अगर चीन और पाकिस्तान देश पर मिसाइलों से अटैक करते हैं तो उन्हें मुंह की खानी पड़ेगी. दरअसल देश में रूस के S-400 का देसी वर्जन तैयार हो रहा है. इसकी रूपरेखा रक्षा अनुसंधान एवं विकास संगठन (DRDO) ने रख दी है. इसका नाम लॉन्ग रेंज सरफेस टू एयर मिसाइल यानि LRSAM रखा गया है. इस समय देश के पास रूस से खरीदे S-400 मिसाइल डिफेंस सिस्टम मौजूद हैं. S-400 दुनिया का सबसे आधुनिक मिसाइल डिफेंस सिस्टम बताया जाता है.

S-400 पठानकोट में पाकिस्तान की सीमा के नजदीक और सिलीगुड़ी में चीन की सीमा पर तैनात है. S-400 LAC या LOC पार करके पाकिस्तान या चीन की ओर से आने वाली किसी भी मिसाइल, किसी भी फाइटर जेट या अटैक हेलिकॉप्टर को आसमान में ही गिरा सकता है.

S-400 पर निर्भरता को कम करेगा DRDO

आपको बता दें कि अभी देश एयर डिफेंस के मामले में सिर्फ S-400 पर निर्भर है. लेकिन DRDO अपनी पहल से रूस के S-400 से भी तेज, सटीक और सबसे आधुनिक स्वदेशी 'लॉन्ग रेंज सरफेस टू एयर मिसाइल' सिस्टम को विकसित कर रहा है. ये देसी रक्षाकवच होने वाला है. DRDO बिल्कुल S-400 की तरह लंबी दूरी तक मार करने वाला स्वदेशी एयर डिफेंस सिस्टम विकसित करने वाला है.

LRSAM की क्या हैं खूबियां

मिसाइल सिस्टम को LRSAM नाम दिया है. ये दुश्मन के लड़ाकू विमानों को मार गिराने की ताकत रखेगा.

स्वदेशी एयर डिफेंस सिस्टम रूसी S-400 मिसाइल सिस्टम की तरह ही है.

स्वदेशी LRSAM की रेंज S-400 के मुकाबले की ही होगी. ये रेंज 400 किलोमीटर तक होगी.

S-400 की तरह इससे दुश्मन की मिसाइलों को मार गिराने की क्षमता होगी. LRSAM दुश्मन के लड़ाकू विमान, बैलिस्टिक मिसाइलों और ड्रोन अटैक को हवा में ही खत्म करने की ताकत रखेगा.

LRSAM सिस्टम 3 लेयर वाला होने वाला है. इससे सतह से हवा में मार करने वाली तीन अलग-अलग रेंज की मिसाइलें फिट हो सकेंगी. ये अलग-अलग दूरियों पर देश की ओर आते हवाई दुश्मन को आसमान में मार गिराएगा.

<https://www.newsnationtv.com/india/news/lrsam-indian-version-of-russia-s-400-missile-system-is-getting-ready-drdo-impenetrable-armor-404727.html>

DRDO's Heavy Drop Parachute System' Gets Bulk Order after Successful Trials

The P-7 Heavy Drop Parachute System, entirely designed and developed in India, is set to enhance the paradropping capabilities of the Armed Forces on the battlefield. As per Gilders India Limited, the Bulk production clearance has been granted and the order has been given to the Ordnance Parachute Factory in Kanpur, a unit under GIL on Friday.

According to DRDO officials, the system has been tailored for the precise delivery of military stores up to 7 tons, the P-7 Heavy Drop System comprises a platform and a specialised parachute system, promising to enhance the operational capabilities of the armed forces.

Successful IAF trials validate the efficacy

On August 19, 2023, the Indian Air Force (IAF) conducted successful trials to validate the system's efficacy and foolproof functioning. Trials, executed from a cargo aircraft, showcased the P-7's ability to securely drop heavy cargo with pinpoint accuracy, ensuring supplies reach even the most remote high-altitude areas (HAA).

Ensuring safe delivery: designed for maximum reliability

The P-7 Heavy Drop System boasts eight main canopies, three extractor parachutes, one drogue parachute, and a suite of electrical, electronic, and mechanical systems. The platform, constructed from a specialised aluminium alloy, adds to the system's robustness, weighing approximately 1,110 kg. Its compact design allows seamless integration onto various aircraft, including the C-17, C-130, and other cargo aircraft of the IAF, providing versatility in deployment.

Weighing approximately 500 kg, the parachute guarantees the secure delivery of heavy cargo, even under challenging conditions. With a maximum load-bearing capacity of 8,500 kg and a permitted payload limit of 7,000 kg, the system operates at drop speeds ranging from 260 to 400 kph, showcasing its adaptability to different scenarios.

'Make in India' triumph

A standout feature of the P-7 Heavy Drop System is its complete reliance on indigenous resources. Manufactured entirely within the country, the system exemplifies the 'Make in India' initiatives. Airbornics Defence and Space Private Limited, in collaboration with ADRDE since 2018, has been at the forefront of R&D activities. This partnership has culminated in the development of a cutting-edge system tailored to the unique needs of the armed forces, as per DRDO officials. The successful validation trials of the enhanced version of the P-7 HDS in 2020, shortly after the Galwan conflict, marked a crucial step in ensuring its readiness for deployment. The cargo was safely landed using a cluster of five large parachutes.

Delivering combat stores to the unreachable

With the P-7 Heavy Drop System, the armed forces acquire an asset capable of delivering combat stores to even the most remote and inaccessible regions. The use of advanced engineering textiles further enhances the system's performance, providing improved water and oil repellency.

<https://www.republicworld.com/india-news/general-news/drds-heavy-drop-parachute-system-gets-bulk-order-after-successful-trials-articleshow.html>



Press Information Bureau
Government of India

Ministry of Defence

Fri, 15 Sep 2023

Another Boost to Aatmanirbharta in Defence: DAC Approves AoN for Nine Capital Acquisition Proposals for the Armed Forces worth Rs 45,000 Crore

Procurement of Light Armoured Multipurpose Vehicles, Integrated Surveillance & Targeting System and Next Generation Survey Vessels gets a nod

Proposals for avionic upgradation of Dornier Aircraft; procurement of Dhruvastra Short Range Air-to-Surface Missile & 12 Su-30 MKI Aircraft also cleared

Time to upgrade indigenisation ambitions; We should aim for a minimum 60-65% indigenous content: Raksha Mantri Shri Rajnath Singh

Defence Acquisition Council (DAC) has accorded Acceptance of Necessity (AoN) for nine capital acquisition proposals of approx. Rs 45,000 crore. The meeting was held under the chairmanship of Raksha Mantri Shri Rajnath Singh on September 15, 2023. All these procurements will be made from Indian vendors under Buy (Indian-Indigenously Designed Developed and Manufactured (IDMM)/Buy (Indian) category which will give substantial boost to the Indian defence Industry towards achieving the goal of 'Aatmanirbhar Bharat'.

To enhance protection, mobility, attack capability and increased survivability of Mechanised Forces, the DAC accorded the AoN for procurement of Light Armoured Multipurpose Vehicles (LAMV) and Integrated Surveillance and Targeting System (ISAT-S). The DAC cleared AoN for procurement of High Mobility Vehicle (HMV) Gun Towing Vehicles for swift mobilisation and deployment of Artillery Guns and Radars.

The DAC also approved procurement of Next Generation Survey Vessels for the Indian Navy which will greatly enhance its capabilities in performing Hydrographic Operations.

The DAC also accorded AoN for proposals of the Indian Air Force which included Avionic upgradation of Dornier Aircraft to improve the accuracy and reliability for operations. The procurement of Dhruvastra Short Range Air-to-Surface Missile as a potent Indigenous Precision Guided Weapon for indigenously built ALH Mk-IV Helicopters has been cleared by the DAC. The AoN for procurement of 12 Su-30 MKI Aircraft with associated equipment from Hindustan Aeronautics Limited (HAL) was also accorded.

During the meeting, Shri Rajnath Singh stated that it is time to upgrade the ambitions towards indigenisation. “Rather than a threshold of 50% indigenous content for IDDM projects, we should aim for a minimum 60-65% indigenous content,” he said. The Raksha Mantri directed the Chief of Defence Staff, Service Chiefs, Defence Secretary and DG (Acquisition) to work towards increasing the minimum indigenous content threshold in consultation with the Indian Industry.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1957703>



Press Information Bureau
Government of India

Ministry of Defence

Sat, 16 Sep 2023

Maritime Information Sharing Workshop 2023

Advancing Maritime Security for a Sustainable Future

The Maritime Information Sharing Workshop (MISW), hosted by the Information Fusion Centre – Indian Ocean Region (IFC-IOR) in Gurugram from 14 - 16 Sep 2023, marked a significant milestone in fostering collaboration among maritime security stakeholders in the region. The event was inaugurated by VAdm Sanjay Mahindru, the Deputy Chief of Naval Staff, Indian Navy and brought together 41 delegates from 26 countries, representing both the Indian Ocean Rim Association (IORA) and the Djibouti Code of Conduct/Jeddah Amendment (DCoC/JA).

VAdm Sanjay Mahindru, in his opening address, emphasised on the myriad maritime safety and security challenges in the Indian Ocean Region (IOR). He underlined the critical need for enhanced maritime collaboration and trust-based partnerships among regional nations.

Day one of the workshop featured a series of enlightening sessions, each designed to provide attendees with a nuanced understanding of the challenges and opportunities in holistic maritime safety and security. VAdm Pradeep Chauhan (Retd), Director General of the National Maritime Foundation, commenced the workshop by providing a holistic perspective on contemporary maritime security challenges, which set the stage for a comprehensive understanding of the multifaceted issues at hand. VAdm Anup Singh (Retd), spoke on the imperative need for international cooperation in maritime security and the significance of information sharing as a catalyst for a collective response. His insights shed light on how nations can come together, pool their resources, and collaborate effectively to address common maritime threats. VAdm AK Chawla (Retd), delved into the realm of technology and innovation in maritime security exploring how cutting-edge technologies can be harnessed to secure the maritime domain. RAdm TVN Prasanna, JS (Maritime Security) at the National Security Council Secretariat (NSCS), shed light on governance challenges in the maritime domain and the intricate task of aligning national efforts to establish a resilient maritime security architecture.

On the second day of the workshop, participants were introduced to India’s two-pronged approach towards maritime security with Information Management and Analysis Centre (IMAC) being a key enabler for national maritime security efforts and Information Fusion Centre – Indian Ocean Region (IFC-IOR) engaging with regional and international partners for a safe and secure Indian Ocean Region. The highlight of the second day was the maritime security exercise, a hands-on experience that immersed participants in real-world scenarios, simulated using the newly introduced indigenous NISHAR-IFC (Network for Information Sharing – Information Fusion Centre) software. The exercise served multiple purposes. Firstly, it aimed to enhance participants’

shared understanding of contemporary maritime safety and security challenges. Secondly, it fostered collaboration and communication among various maritime entities, ensuring a synchronized and effective response to potential threats. Lastly, it provided an opportunity for participants to work as a cohesive team, preparing contingency plans tailored to a variety of maritime scenarios. Above all, this day underscored the paramount importance of collaborative endeavours. It emphasized that, in the realm of maritime security, success hinges upon the collective efforts of nations, organizations, and professionals working in unison. The proceedings of day two culminated with RAdm Rahul Shankar, Assistant Chief of Naval Staff (Communication, Space & Network Centric Operations), highlighting the importance of collaborative maritime security constructs, shared resources, information sharing and technology in navigating the intricate web of maritime safety and security challenges in the IOR.

The third and final day of the Maritime Information Sharing Workshop (MISW) 23 was an exclusive session dedicated to the Djibouti Code of Conduct-Jeddah Amendment (DCoC/JA) countries. India is an observer nation in this construct and has committed support for capacity building and capability enhancement. Capt Rohit Bajpai, Director, IFC-IOR, set the stage for an intellectually stimulating day. Mr. Kiruja Micheni, the International Maritime Organization (IMO) Project Manager for DCoC/JA, followed with a keynote address that highlighted the significance of international collaboration in ensuring maritime security. The primary agenda of the day was to streamline the DCoC Information Sharing Network (ISN) Standard Operating Procedures (SOPs). Cdr Deepak Lavaniya, Deputy Director of IFC-IOR, led a thought-provoking session on the critical need for a robust information-sharing architecture to enhance maritime safety and security. Participants engaged in brainstorming sessions, contributing valuable insights towards refining their SOPs. In the afternoon session, Shri Jayant Misra, Consultant specializing in Drug Law Enforcement from the UNODC Regional Office for South Asia, shed light on the complexities of combating transnational crimes in the maritime domain. The workshop culminated with a closing address by Ms Muanpui Saiawi, Joint Secretary for Disarmament & International Security Affairs (D&ISA) at the Ministry of External Affairs. Her remarks encapsulated the spirit of collaboration and mutual trust that defined MISW 23, underscoring the importance of such initiatives in advancing maritime security.

MISW 2023 not only fostered knowledge exchange but also strengthened international bonds, reaffirming the commitment of nations to work together towards a safer and more secure maritime environment. The theme of MISW 2023, "Advancing Maritime Security for a Sustainable Future," echoed at Gurugram for the last three days. The workshop served as an invaluable platform for participants to delve deep into the intricacies of maritime security and the robust information-sharing mechanisms required for success in the endeavour. The workshop not only nurtured knowledge but also forged a functional understanding of contemporary challenges among all those involved.

In the spirit of India's vision of "Security And Growth for All in the Region (SAGAR)," the country's tireless efforts were brought to the forefront during MISW 23. IFC-IOR's mission aligns seamlessly with the tenets of SAGAR, underscoring the need for security, stability, and prosperity in the Indian Ocean Region. Through active collaborations with 42 maritime security constructs and 25 partner countries, IFC-IOR has been instrumental in advancing this vision. This commitment extends beyond borders and underscores the shared responsibility of all nations to safeguard the vital maritime arteries that connect us. MISW 23 has been more than just a workshop; it has been a collective endeavour to chart the course toward a more secure and prosperous maritime future. The bonds formed and knowledge exchanged here will continue to ripple across the seas, shaping maritime safety and security for years to come.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1958025>



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Ministry of Defence

Sat, 16 Sep 2023

Indian Coast Guard Ship Samudra Prahari on an Overseas Deployment to ASEAN Countries as Part of India's Initiative for Marine Pollution Response in the Region

13 NCC cadets onboard to participate in Puneet Sagar Abhiyan in the region

The Indian Coast Guard Ship Samudra Prahari, a specialized Pollution Control Vessel, is currently on an overseas deployment to ASEAN countries from 11 Sep to 14 Oct 2023. This deployment is part of India's ASEAN initiatives for Marine Pollution Response, showcasing the Pollution Response capabilities of the Indian Coast Guard (ICG) and its commitment to addressing marine pollution issues and enhancing capacity in the region. The ship is equipped with a Chetak Helicopter in Pollution Response configuration, enhancing its capabilities in this area. This initiative was announced by Raksha Mantri Rajnath Singh during the ASEAN Defence Minister Meeting Plus meeting in Cambodia in November 2022. During this deployment, the ship is scheduled to make port calls in Bangkok, Ho Chi Minh, and Jakarta. It will demonstrate the ICG's pollution response capabilities and its dedication to collaborative efforts for marine pollution response. As part of an overseas exchange program, the ship has embarked 13 NCC cadets to participate in "Puneet Sagar Abhiyan," an international outreach program focused on beach clean-ups and similar activities in coordination with partner nations.

This visit holds significant importance in strengthening bilateral relationships with key maritime agencies, including the Thai Maritime Enforcement Command Centre and BAKAMLA (Indonesia Maritime Security Agency). These relationships have evolved over the years to ensure the safety, security, and cleanliness of the seas in the region. Engagements with senior officials and personnel from these agencies during the visit will further enhance regional safety and security.

The visit's agenda includes professional exchanges, cross-deck visits, planning and tabletop exercises, joint exercises, as well as official and social engagements including visits to capacity-building facilities. The visit of ICGS Samudra Prahari to ASEAN countries reinforces India's continuous efforts to foster friendly relations through maritime cooperation. This aligns with the vision of Prime Minister Shri Narendra Modi, known as "SAGAR - Security and Growth for All in the Region," which seeks to unite the region. It also echoes the Indian government's theme during its G20 Presidency: "Vasudhaiva Kutumbakam" – One Earth, One Family, One Future.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1958029>

THE TIMES OF INDIA

Sun, 17 Sep 2023

Defence Ministry Clears Proposal to Buy 'Pralay' Ballistic Missiles for Army: All you Need to Know

The defense ministry has granted approval for the acquisition of a regiment of 'Pralay' ballistic missiles, which will be deployed along the Line of Actual Control and the Line of Control.

The decision to add more firepower to the Army's military capabilities was reached during a recent meeting of the Defence Acquisition Council, and it represents a pivotal development for the Army, defence officials told ANI.

Pralay will be the longest-range surface-to-surface missile in the inventory of the Army.

Pralay, along with the BrahMos supersonic cruise missile, will form the crux of India's planned Rocket Force.

Both China and Pakistan have already deployed ballistic missiles for tactical purposes, and the 'Pralay' missiles, developed by the Defense Research and Development Organization (DRDO), are poised for further enhancements in range as per military requirements.

The procurement follows a similar approval granted to the Indian Air Force for the acquisition of these missiles.

All you need to know about Pralay:

- The 'Pralay' ballistic missiles have a strike range spanning 150 to 500 kilometers.
- It is capable of carrying a conventional warhead of about 350 kg to 700 kg, which gives it a deadly punitive capability.
- It can also carry a high explosive preformed fragmentation warhead, penetration-cum-blast (PCB) and runaway denial penetration submunition (RDPS).
- 'Pralay' is classified as a quasi-ballistic surface-to-surface missile, featuring advanced capabilities designed to thwart interceptor missiles.
- It exhibits the capability to alter its trajectory mid-flight after covering a certain distance.
- The missile is propelled by a solid propellant rocket motor and incorporates cutting-edge technologies in its guidance system, including state-of-the-art navigation and integrated avionics.
- It can be compared to China's Dong Feng 12 and the Russian Iskander missile that has been used in the ongoing war with Ukraine.
- This missile system's development commenced around 2015 and was significantly driven by the late General Bipin Rawat during his tenure as Chief of Army Staff.

<https://timesofindia.indiatimes.com/india/defence-ministry-clears-proposal-to-buy-pralay-ballistic-missiles-for-army-all-you-need-to-know/articleshow/103736331.cms>



Sat, 16 Sep 2023

Centre Clears Proposal to Buy 12 Su-30 MKI Fighter Jets

The Defence Acquisition Council (DAC) Friday cleared proposals worth Rs 45,000 crore to acquire 12 Su-30 MKI fighter aircraft and indigenous Dhruvastra short range air-to-surface missile for the Indian Air Force among nine platforms and weapon systems for the armed forces.

A statement released by the defence ministry said that the DAC has granted Acceptance of Necessity (AoN) to procure 12 Su-30 MKI aircraft with associated equipment from the state-owned Hindustan Aeronautics Limited (HAL). The DAC, which is headed by Defence Minister Rajnath Singh, is among the top bodies for clearing major capital acquisitions for defence. AoN is the first

step in the long defence procurement process. Grant of an AoN does not necessarily lead to a final order.

A Russian-origin fighter jet, the Su-30 MKI jets have had a good flight safety record. The IAF had inducted 272 of these jets since 1998. Around 10 Su-30s have crashed since 2010.

Officials told The Indian Express that once procured and inducted, the IAF's Su-30 fleet will be back to the planned levels by replacing the aircraft lost over the years in training.

The DAC also accorded AoNs for the procurement of Dhruvastra short range air-to-surface missile, which is to be fired from the HAL-made Advanced Light Helicopters Mk-IV.

The precision guided missiles were designed by the Defence Research Development Organisation.

The DAC also cleared proposals for avionics upgradation of the Dornier aircraft, which would improve the accuracy of operations for IAF.

The DAC accorded the AoN for procurement of Light Armoured Multipurpose Vehicles (LAMV) and Integrated Surveillance and Targeting System (ISAT-S) aimed at enhancing protection, mobility, attack capability and increased survivability of the Army's mechanised forces.

Proposals for procurement of High Mobility Vehicle (HMV) Gun Towing Vehicles for swift mobilisation and deployment of artillery guns and radars for the Army and Next Generation Survey Vessels to enhance the Navy's capabilities in performing hydrographic operations were also cleared by the DAC. According to the defence ministry, all these procurements will be made from Indian vendors under relevant categories of the Defence Acquisition Procedure, which governs all capital acquisitions of the ministry.

During the meeting, the Defence Minister stated that it is time to upgrade the ambitions towards indigenisation. Singh said instead of a threshold of 50% indigenous content for indigenously designed, developed and manufactured projects, the aim should be a minimum 60-65% indigenous content.

He asked the Chief of Defence Staff, Service Chiefs, Defence Secretary and DG (Acquisition) to work towards increasing the minimum indigenous content threshold in consultation with the Indian Industry.

<https://indianexpress.com/article/india/centre-clears-proposal-to-buy-12-su-30-mki-fighter-jets-8941926/>

THE ECONOMIC TIMES

Sat, 16 Sep 2023

Indian Air Force Chief Announces Plans to Buy Around 100 More Indigenous LCA Mark 1A Fighter Jets

In a significant move aimed at strengthening India's aerospace capabilities, the Indian Air Force (IAF) has officially announced its intention to procure about 100 additional Made-in-India LCA Mark 1A fighter jets.

During his visit to Spain, Air Chief Marshal VR Chaudhari, the Chief of the Indian Air Force, made this announcement while receiving the first C-295 transport aircraft. Speaking to ANI, he underscored the pivotal role of the Light Combat Aircraft (LCA) in replacing the aging MiG-series fleet, which includes the MiG-21, MiG-23, and MiG-27 aircraft.

"With the retirement of these aging aircraft, it is imperative that we bolster our inventory with LCA class aircraft. Therefore, in addition to the 83 LCA Mark 1A aircraft we have already contracted for, we are advocating for the acquisition of around 100 more," Chaudhari said.

The Indian Air Force's objective in acquiring these domestically produced aircraft is to phase out the older MiG-series fighter jets in its fleet. The proposal has been formally submitted to the Defence Ministry and other national security stakeholders.

This decision to procure approximately 100 more LCA Tejas fighters follows a comprehensive review meeting chaired by the Indian Air Force Chief, which included key stakeholders in the indigenous fighter jet program, such as Hindustan Aeronautics Limited (HAL).

If this order is approved and realized, it would represent a substantial expansion of the Indian Air Force's LCA Tejas fleet. Over the next 15 years, the IAF is expected to have 40 LCA Tejas, more than 180 LCA Mark-1A, and a minimum of 120 LCA Mark-2 aircraft in its inventory.

The previous order for LCA Mark 1A comprised 83 aircraft, with the first deliveries anticipated around February 2024. The LCA Mark 1A stands as an advanced iteration of the Tejas aircraft, featuring upgraded avionics and radar systems compared to the initial 40 LCAs supplied to the Air Force.

The LCA Mark 1A boasts a substantial indigenous component of over 65 percent, reaffirming India's commitment to self-reliance in the aerospace sector. This program aligns seamlessly with the Atmanirbhar Bharat and Make in India initiatives, highlighting the nation's unwavering dedication to achieving self-sufficiency in aerospace technology and manufacturing.

<https://economictimes.indiatimes.com/news/defence/indian-air-force-chief-announces-plans-to-buy-around-100-more-indigenous-lca-mark-1a-fighter-jets/articleshow/103711549.cms>



Sun, 17 Sep 2023

Army Likely to Complete Inducting 114 Dhanush Guns by 2026

The Army which has ordered 114 Dhanush artillery guns, and has one regiment operational already, is expecting to receive all the guns by 2026, according to defence sources. With focus on long-range and augmented firepower, the Army is also looking at vastly increasing the range of the Pinaka Multi-Rocket Launch Systems (MRLS) and the Defence Research Development Organisation (DRDO) is working on it. The Pralay surface-to-surface quasi-ballistic missile too is in advanced stages of induction, sources said.

“One regiment that was equipped with Dhanush was operationalised only last year. There has been slight delay due to some imported components, among others... All that has stabilised. By 2026, Army should be getting balance regiments,” a defence source said.

Dhanush is a 155 mm, 45-calibre towed artillery gun with a range of 36 km, and it has demonstrated a range of 38 km with specialised ammunition. It is an upgrade of the existing 155 mm, 39-calibre Bofors FH 77 gun. The Advanced Weapons and Equipment India Limited, carved after corporatisation of the Ordnance Factory Board, now manufacturing the Dhanush guns has a team on site and is working with the Army, sources stated. Meanwhile, the war in Ukraine has underscored the importance of long-range firepower, both precision as well as saturation, and

MRLS have proven to be decisive, sources noted. In this regard, the indigenous Pinaka Rocket System developed by the DRDO has been a success story for the Army, the source noted.

The Army currently has four Pinaka regiments and six more on order. They are expected to be inducted in the next few years. In addition to adding numbers, the Army is keen on extending its range as well the configurations available. “The induction of additional regiments of Pinaka is likely to commence shortly. The DRDO is also exploring increasing the range of Pinaka rockets to 120 km and 300 km,” the source stated.

As reported by The Hindu earlier, the range of the original Pinaka rockets was 37 km which was enhanced to 45 km with the upgraded Mk-1, while the guided Pinaka has a range of 75 km which the Defence Acquisition Council has already cleared for procurement. A Pinaka Area Denial Munition rocket system has also been developed and successfully flight-tested by DRDO and the Army in April 2022. Pinaka with a range of 120 km is under development, DRDO officials had stated earlier. The Army is scheduled to conduct trials of these extended and guided Pinaka rockets very soon, sources said.

Grad rocket regiments

Among other MRLS, the Army has five Grad rocket regiments and three Smerch regiments both of Russian-origin. Smerch is the longest range rocket system in the Army’s inventory with a range of 90 km. Pinaka will eventually become the mainstay of multi-rocket systems.

Beyond MRLS, missiles give the Army much-needed range and here, the BrahMos supersonic cruise missile is the mainstay. “Missile capability is being enhanced in terms of range and accuracy for both ballistic and cruise missiles by DRDO. Range of BrahMos missile has been extended and DRDO is also exploring development of a number of other missiles with various ranges and capabilities,” sources said.

In addition to these, the Army’s Regiment of Artillery, is inducting a range of Unmanned Aerial Vehicles to support the artillery teams as well as deploying a new Battlefield Management System.

In March, the Regiment of Artillery issued a tender for fast-track procurement of 10 Runway-Independent Unmanned Aerial Vehicles as well a tender for development and procurement of 65 Tactical Remotely Piloted Aircraft System (Runway Independent) from indigenous sources. Similarly, in December 2022 the Regiment of Artillery issued a tender for 106 Inertial Navigation Systems through Fast Track Procedure under Buy (Indian) category for ground-based surveillance sensors, Observation Post Officers, guns, and Long-Range Vectors.

<https://www.thehindu.com/news/national/army-likely-to-complete-inducting-114-dhanush-guns-by-2026/article67317964.ece>



Sat, 16 Sep 2023

BrahMos Manufacturing in Lucknow Likely to Begin from March: Rajnath Singh

Defence Minister Rajnath Singh on Saturday said the work on the BrahMos missile manufacturing site in Lucknow is likely to be completed by March next year. Singh was speaking in Gomti Nagar in Lucknow on the second day of the tour of his parliamentary constituency.

"The work on BrahMos missile project is also going on at a fast pace and after next February-March, the missile manufacturing will begin on the soil of Lucknow," the BJP leader said.

Developed by an India-Russia joint venture, the BrahMos supersonic cruise missile can be launched from submarines, ships, aircraft or from land platforms.

The work on the Defence Research and Development Organisation (DRDO) lab will also be completed soon, Singh said.

He said there were 11 other projects in Lucknow that have been undertaken. "Though they will take some time to complete, I can say that people will see a completely different Lucknow in the next few years," the minister said.

During his visit in June, Singh had said that "everything from nuts and bolts to BrahMos missiles would be manufactured in the Uttar Pradesh Defence Industrial Corridor (UPDIC)".

"We have created a conducive environment for defence manufacturing through the defence corridors in Uttar Pradesh and Tamil Nadu. UPDIC has told me that there is a plan to acquire about 1,700 hectares of land for this corridor, of which more than 95 per cent of the land has already been acquired," he had said.

According to a statement issued by the Bharatiya Janata Party on Saturday, the minister inspected the ongoing work of the Munshi Pulia Over Bridge being built at Khurram Nagar and Polytechnic intersection in Indira Nagar Sector 25 on the second day of his visit to his Lok Sabha constituency Lucknow.

He also inspected the ongoing work at Gomti Nagar railway station.

Singh said, "I am satisfied with the way the work is going on at Gomti Nagar Railway Station. It will be completed by December."

<https://www.deccanherald.com/india/uttar-pradesh/brahmos-manufacturing-in-lucknow-likely-to-begin-from-march-rajnath-singh-2689424>



Sun, 17 Sep 2023

Learning from Russia-Ukraine War, Indian Army Makes Changes in its Weapon Doctrines, Acquiring Plans

The Russia-Ukraine war has stressed upon the need to have a judicious mix of guns and rockets in the Indian Army's artillery. As per top officials, we need to acquire niche technologies and more precision weapon systems, reported the Indian Express.

The Russia-Ukraine war has reemphasised on the importance of having a solid firepower as a battle-winning factor, considering the fact that 80 per cent of casualties reported in the war were due to artillery fire, said another official.

Russia is reportedly firing 20,000 shells in a day, meanwhile, Ukraine is firing around 5,000 shells every day.

"It has been seen that the massive firepower used in the war has resulted in a lot of destruction. It has underlined the need to have judicious mix of guns and rockets in our inventory," the official said.

The war has also shown that battlefield transparency had a major role to play in the war by identifying, acquiring and engaging a target in real time.

“The war has shown that the time between acquiring and engaging a target has gone down from five to 10 minutes in the past to one or two minutes now. There is a need to engage the target as quickly as possible before it changes course and thus the need for a more effective kill chain,” the official said.

According to officials, the lessons from the war between Russia and Ukraine has made Indian Army create an overhauled artillery profile. "While the western front requires more mounted gun systems and self-propelled gun systems, the towed guns systems with a shoot-and-scoot capability would be more apt for deployment along India's mountainous northern borders," they said.

“We have recently concluded four contacts with different types of 155mm guns. Several regiments have already been equipped with these guns and additional guns are being procured at a fast pace,” an official added.

Meanwhile, DRDO is also enhancing its missile capabilities in terms of accuracy and range for both cruise and ballistic missiles. “A lot of improvement is taking place in our ammunition systems and the focus is on precision-guided munitions. We are engaged with the academia and the industry for various projects related to 155mm shells,” an official said.

<https://www.deccanherald.com/india/learning-from-russia-ukraine-war-indian-army-makes-changes-in-its-weapon-doctrines-acquiring-plans-2690160>

Business Standard

Sun, 17 Sep 2023

Defence Startup's Nano Drones Shows Potential in Counter-Terror Operations

A defence startup founded two years ago by a team of young engineers from IIT Roorkee has developed three variants of nano drones, including a 'Kamikaze' UAV, which have application in anti-insurgency and counter-terrorism operations.

Mayank Pratap Singh, the co-founder of the startup IDR, said, "This is the first time that nano drones have been developed indigenously in this country."

"In just two years since the formation of our startup in 2021, we have developed three variants of nano drones that are actively aiding security forces in their efforts against insurgency and terrorism," Singh told PTI here.

He said IDR Research and Development has introduced the Doot Mk1 nano drone in three specialised variants, which were showcased at the North-tech symposium. The symposium was held here recently to address operational challenges and procure state-of-the-art equipment for the Army.

Weighing approximately 200 grams, these drones boast an endurance of up to 30 minutes and can reach a maximum speed of 80 kmph with very low sound, Singh said, adding the Doot Mk1 is equipped with artificial intelligence capabilities, allowing it to identify up to 80 different objects.

"One version of the drone is optimised for outdoor operations, another for indoor settings, and there's an explosive variant (Kamikaze).

"These nano drones can be deployed in under 10 seconds during emergencies. Their compact sizes allow them to be navigated in complex spaces, whether launched from hand, rooftop, or moving vehicles," Singh said.

The 'Kamikaze' version, named Parush, explodes upon reaching its target.

Carrying explosives, the drone has a kill button for it to detonate, he said, adding the drones equipped with such mechanism would have to be programmed to identify the enemy's hideout and explode there.

"Parush means lethal or destructive. We have successfully tested the explosive drone recently and are working on the safety part now," he said. "It will be ready by December."

About the Doot MK1 drone, Singh said, the live feed from it is relayed to multiple screens, ensuring seamless coordination in close combat scenarios. It has a range of 1.5 kilometers, and is operable indoors or within buildings covering 200 to 300 metres, he added.

These nano drones were tested by various commands of the armed forces as well as the NSG and Assam rifles, the startup's officials said, adding that the Army has produced 20 units.

The cost of a nano drone is roughly Rs 5 lakh to Rs 6 lakh.

"Our drones are crafted specifically for Indian conditions. They have successfully passed tests in high-altitude areas, deserts, and varying weather conditions," Singh said, adding that these nano drones are essential for anti-terrorism operations, close-quarter combats, indoor interventions, and silent intelligence, surveillance and reconnaissance (ISR) operations.

The mini drones that are currently in use in India are predominantly the US-manufactured 'Black Hornet.'

The startup is actively exploring opportunities for exporting its products.

"We recently participated in a defence exhibition in Gujarat and received excellent feedback from countries such as Sri Lanka, Mauritius, and Morocco. Discussions are underway with their respective governments for procurement. The Cambodian army has expressed interest and discussions for potential procurement are underway," Singh said.

https://www.business-standard.com/companies/start-ups/defence-startup-s-nano-drones-shows-potential-in-counter-terror-operations-123091700604_1.html

R. REPUBLICWORLD.COM

Fri, 15 Sep 2023

Armenia Leads as First Export Customer for India's ATAGS Artillery Guns

In a significant stride towards bolstering its defense export portfolio, Bharat Forge, led by Chairman and Managing Director Baba Kalyani, has successfully delivered six cutting-edge 155-millimeter Advanced Towed Artillery Gun System (ATAGS) artillery guns to Armenia. This achievement underscores India's prowess in defense technology and its growing role in the global arms trade.

Armenia's commitment to strengthening its defense capabilities has resulted in a substantial order for a total of 90 ATAGS units from Bharat Forge, amounting to a remarkable \$155.5 million, equivalent to ₹1,265 crore. The contract outlines the phased shipment of an additional 84 ATAGS

guns over the next three years, a testament to the trust Armenia places in Bharat Forge's capabilities.

DRDO and DPSUs behind ATAGS success

Developed indigenously by the Defense Research and Development Organization (DRDO) in collaboration with private sector defense manufacturer Bharat Forge, the ATAGS is a testament to India's commitment to modernizing its armed forces. This cutting-edge artillery system boasts a 155-millimeter caliber and is designed to provide unmatched firepower, accuracy, and mobility on the battlefield.

One of the standout features of the ATAGS is its impressive range, capable of hitting targets at distances of up to 48 kilometers with precision-guided munitions. This extended reach gives the Indian Army a significant tactical advantage, allowing it to engage enemy positions from safer distances. Furthermore, the ATAGS' advanced automation and digital systems reduce crew fatigue and enhance operational efficiency.

Armenia's Thorough Evaluation Process Validates ATAGS Excellence

Armenia has carved its place in history as the inaugural export customer to acquire the formidable 155-millimeter ATAGS artillery guns, even before their adoption by India, the home country. This highlights the global appeal and confidence in the ATAGS system, which has successfully passed rigorous Indian Army User Trials, attesting to its effectiveness and reliability.

Before finalizing the order, the Armenian Defence Forces conducted an exhaustive two-month evaluation of the ATAGS guns at the renowned Pokhran Range. The trials showcased the system's exceptional capabilities and precision, reinforcing the ATAGS artillery guns as a game-changer in modern warfare.

With this achievement, Bharat Forge's reputation as a premier defense equipment manufacturer is further solidified. The ATAGS artillery guns are renowned for their precision and firepower, and Armenia's acquisition will undoubtedly bolster its national security. Bharat Forge remains committed to delivering state-of-the-art defense technology to its international partners, reaffirming India's position as a reliable exporter of advanced military equipment. This success story not only elevates India's standing in the global defense market but also enhances the nation's strategic relationships with its allies.

<https://www.republicworld.com/india-news/general-news/armenia-leads-as-first-export-customer-for-indias-atags-artillery-guns-articleshow.html>



Fri, 15 Sep 2023

Catalyzing India's Air Dominance: The Rise of Nyoma Air Base in Ladakh

By Huma Siddiqui

The Indian Air Force (IAF) is reinforcing its presence in the challenging terrain of Ladakh, a region sharing borders with China and Pakistan. This strategic move involves the establishment of a new full-fledged operating base in Nyoma, Ladakh.

Currently, Nyoma possesses a mud-paved runway, primarily used for helicopters and special operations planes like the C-130J. However, it is undergoing a transformation into a fighter jet base with a paved runway capable of launching and recovering planes and performing minor maintenance tasks.

The IAF already operates from Leh, Kargil, and Thoise (the base for Siachen operations) in the Ladakh region. Additionally, there's a semi-paved airstrip at Daulat Beg Oldie and two mud-paved landing grounds at Chushul and Fukche.

Nyoma, situated on the banks of the Indus River, approximately 180 kilometers southeast of Leh, stands at an altitude of 13,700 feet, making it one of the world's highest airfields. India's Defence Minister praised this initiative, stating that this airfield would be a game-changer for the armed forces.

The Defence Minister Rajnath Singh, in a recent event, inaugurated a significant development by unveiling 90 Border Roads Organisation (BRO) projects, amounting to Rs 2,941 crores, across ten states and union territories. Among these projects was the inauguration of the 422.9-meter Devak Bridge in Samba, Jammu, and the 500-meter Nechiphu Tunnel in Arunachal Pradesh.

The BRO, under the Ministry of Defence, has been entrusted with the task of completing the Nyoma project, which comes at a cost of Rs 214 crores, within two years. This undertaking will result in a fully functional paved runway for fighter jets, complemented by essential military infrastructure.

The Nyoma site spans across 1,235 acres and will host a 2.7-kilometer runway. This development becomes particularly crucial in the wake of the military standoff with China in April 2020 and the subsequent clashes in Galwan, eastern Ladakh, in June 2020. In response, the IAF initiated a significant airlift operation from existing bases in the region. This operation involved the transportation of over 68,000 Army soldiers, nearly 90 tanks, around 330 BMP infantry combat vehicles, radar systems, artillery, and other equipment to rapidly reinforce positions along the Line of Actual Control.

While Chushul and Fukche airstrips are in close proximity to the Line of Actual Control, they are within the observation range of Chinese forces, making them suitable for emergency use only. Nyoma's transformation into a fully operational fighter jet base will significantly enhance India's military capabilities in the Ladakh region, ensuring greater preparedness and agility in the face of evolving security challenges.

<https://www.financialexpress.com/business/defence-catalyzing-indias-air-dominance-the-rise-of-nyoma-air-base-in-ladakh-3244838/>



Sat, 16 Sep 2023

Pakistan Air Force Carries out Flying Exercises in China, Egypt

The Pakistan Air Force (PAF) has carried out two large-scale flying exercises, one each at China and Egypt, and claimed it marked "a significant milestone" in its journey towards emerging as a 'formidable air force.'" The participation includes PAF's J-10 C and JF-17 lead fighter aircraft, combat pilots, air defence controllers, and technical ground crew, who are actively engaged in the Shaheen-X bilateral Air Exercise hosted by the People's Liberation Army Air Force in China, as

well as the Bright Star Air Exercise held in Egypt, Dunya News channel's website reported on Friday.

The annual bilateral China-Pakistan Joint Air Force Training Exercise 'Shaheen (Eagle) – X' is being held at Jiuquan and Yinchuan in northwest China. The exercise that started last week in August will continue till mid-September.

The People's Liberation Army Air Force (PLAAF) of China and the PAF have been conducting Shaheen joint exercises since 2011, which are being hosted by both countries on an alternate basis, ChinaMilitary.com said.

Quoting a PAF statement, the Dunya News report further said, "The participation of these fighter jets in Exercise Shaheen-X marks a significant milestone in PAF's journey towards a technologically advanced and formidable air force." The Shaheen-X exercise in China and the Bright Star Air Exercise in Egypt provide invaluable opportunities for PAF to build upon its operational experience and exchange knowledge with esteemed counterparts from around the world, it said.

Meanwhile, the annual 'Bright Start' exercise for 2023 concluded at the Mohamed Naguib Military Base in the city of Hammam in Egypt. The joint Egypt-US military exercise Bright Star 2023 saw the participation of 800 fighters from 19 countries, the Egyptian armed forces had announced earlier in the month.

Pakistan was among the countries that participated in the exercise taking place on Egypt's North Coast and other naval bases and air bases across Egypt. The others included India, Saudi Arabia, Greece, UAE, Oman, Jordan, the UK, Greece and Cyprus.

<https://www.deccanherald.com/world/pakistan-air-force-carries-out-flying-exercises-in-china-egypt-2689175>



Sat, 16 Sep 2023

North Korea's Kim Jong Un Inspects Russian Bombers and Warship on a Visit to Russia's Far East

North Korean leader Kim Jong Un inspected Russia's nuclear-capable bombers, hypersonic missiles and an advanced warship from its Pacific fleet on Saturday as he continued a trip in Russia's Far East that has sparked Western concerns about an arms alliance that could fuel President Vladimir Putin's war on Ukraine.

After arriving in the city of Artyom by train, Kim traveled to an airport just outside the port city of Vladivostok where Russian Defense Minister Sergei Shoigu and other senior military officials gave him an up-close look at Russia's strategic bombers and other warplanes. All the Russian warplanes shown to Kim on Saturday were among the types that have seen active use in the war in Ukraine, including the Tu-160, Tu-95 and Tu-22 bombers that have regularly launched cruise missiles.

Shoigu and Lt. Gen. Sergei Kobylash, the commander of the Russian long-range bomber force, explained to Kim that the Tu-160 had recently received new cruise missiles with a range of more than 6,500 kilometers (over 4,040 miles). Pointing at the weapons bay, Shoigu said that each bomber carries 12 missiles.

Russian officials have previously said that the new missile was under development, and the latest comments confirmed its deployment for the first time.

Shoigu, who had met Kim during a rare visit to North Korea in July, also showed Kim another of Russia's latest missiles, the hypersonic Kinzhal, carried by the MiG-31 fighter jet, that saw its first combat during the war in Ukraine, according to Russia's Defense Ministry.

Kim and Shoigu later traveled to Vladivostok, where they inspected the Admiral Shaposhnikov frigate. Russia's navy commander, Adm. Nikolai Yevmenov, briefed Kim on the ship's capabilities and weapons, which include long-range Kalibr cruise missiles that Russian warships have regularly fired at targets in Ukraine.

Kim's visits to military and technology sites this week possibly hint at what he wants from Russia, perhaps in exchange for supplying munitions to refill Putin's declining reserves as his invasion of Ukraine becomes a drawn-out war of attrition.

Kim's trip to Russia, which included more than four hours of talks with Putin on Wednesday, comes amid momentum in military cooperation between the countries in which North Korea could potentially seek Russian technologies to advance Kim's nuclear, missile and other military programs in exchange for providing Russia with badly needed munitions.

Videos released by Russia's Defense Ministry showed Shoigu greeting Kim at the airport along with honor guards lined up near a red carpet. Kim was seen peering at the Kinzhal missile, gesturing and asking questions about the warplanes' capabilities as he discussed technical details with Shoigu and other military officials through translators.

Kim was also seen talking to Shoigu and Yevmenov about a purported nuclear attack submarine the North unveiled last week as they stepped out of the Shaposhnikov frigate.

The visit follows Kim's tour on Friday of a factory producing advanced Russian warplanes.

Kim in recent months has emphasized the need to strengthen his navy to counter the advanced naval assets of the United States, which has been expanding its combined military exercises with South Korea to counter the North's growing threat.

Analysts say Kim's focus on naval strength could be driven by ambitions to obtain sophisticated technologies for ballistic missile submarines and nuclear-propelled submarines as well as to initiate joint naval exercises between Russia and North Korea.

After meeting Putin at Russia's main spaceport, a location that pointed to Kim's desire for Russian assistance in his efforts to acquire space-based reconnaissance assets and missile technologies, North Korea's leader reappeared Friday in the far eastern city of Komsomolsk-on-Amur for a visit to a plant producing Russia's Su-57 fighter jets.

Experts have said potential military cooperation between the countries could include efforts to modernize North Korea's outdated air force, which relies on warplanes sent from the Soviet Union in the 1980s.

Kim's trip to Russia, his first since April 2019 when he met Putin in Vladivostok, came days after he attended a ceremony at a North Korean military shipyard where the country unveiled the alleged nuclear attack submarine.

State media claimed it is capable of launching tactical nuclear weapons from underwater. But South Korea's military expressed doubt about the operational capabilities of the sub, which was the result of reshaping an existing submarine to install missile launch tubes.

Kim has also announced goals to acquire nuclear-propelled submarines, which can quietly travel long distances and approach enemy shores to deliver strikes, a key asset in his efforts to build a

viable nuclear arsenal that could threaten the United States. Analysts say such capacities would be unfeasible for the North without external assistance.

Putin on Friday reiterated that Russia would abide by UN sanctions, some of which ban North Korea from exporting or importing any weapons. Kremlin spokesperson Dmitry Peskov separately said that no agreements on bilateral military cooperation were signed after the Putin-Kim meeting Wednesday.

Experts say North Korea and Russia aren't likely to publicize any deals on weapons to avoid stronger international criticism.

Kim, whose visit to Russia is his first foreign trip since the COVID-19 pandemic, has been eager to boost the visibility of his partnerships with Moscow and Beijing as he attempts to break out of international isolation and insert Pyongyang in a united front against Washington. Some South Korean experts say that Kim could also pursue a meeting with Chinese President Xi Jinping.

In another sign of the North's post-pandemic opening, KCNA said Saturday that a team of North Korean athletes departed from Pyongyang to participate in the Asian Games starting next week in Hangzhou, China. South Korea's government says around 190 North Korean athletes are registered for the event.

Since last year, the US has accused North Korea of providing ammunition, artillery shells and rockets to Russia, many of them likely copies of Soviet-era munitions. South Korean officials said North Korean weapons provided to Russia have already been used in Ukraine.

<https://www.newindianexpress.com/world/2023/sep/16/north-koreas-kim-jong-un-inspects-russian-bombers-and-warship-on-a-visit-to-russias-far-east-2615505.html>

Science & Technology News

THE TIMES OF INDIA

Fri, 15 Sep 2023

Aditya-L1 Completes 4th Earth Op, to Begin Journey to Final Destination on September 19

Early on Friday, scientists from the Isro Telemetry, Tracking and Command Network (Istrac) implemented the fourth Earth-bound manoeuvre of Aditya-L1, India's first solar space observatory mission, that was launched on September 2. Today's manoeuvre happened at 2.15am.

The spacecraft is now in an orbit of 256km x 1,21,973km, Isro said, adding that its ground stations in Mauritius, Bengaluru, Sriharikota and Port Blair tracked the satellite during this operation, while a transportable terminal currently stationed in the Fiji islands for Aditya-L1 will support post-burn operations.

A day ahead of the launch, Isro had said that post launch, Aditya-L1 would stay in Earth-bound orbits for 16 days, during which it would undergo five manoeuvres to gain the necessary velocity for its journey. Subsequently, it would undergo a Trans-Lagrangian1 Insertion (TLI) manoeuvre, marking the beginning of its 110-day trajectory to the destination around the L1 Lagrange point.

On Friday, Isro said: "The next manoeuvre, TLI — a send-off from the Earth — is scheduled for September 19, 2023, around 2am."

Upon arrival at L1, another manoeuvre will bind Aditya-L1 to an orbit around L1. The L1 — about 1.5-million-km from Earth — refers to Lagrange Point-1 of the Sun-Earth system. It is a location in space where the gravitational forces of two celestial bodies, such as the Sun and Earth, are in equilibrium. This allows an object placed there to remain relatively stable with respect to both celestial bodies.

Aditya-L1 will spend its whole mission life orbiting around L1 in an irregularly shaped orbit in a plane roughly perpendicular to the line joining the Earth and the Sun

<https://timesofindia.indiatimes.com/india/4th-earth-op-complete-aditya-l1-to-get-send-off-from-earth-on-september-19/articleshow/103673310.cms>



Fri, 15 Sep 2023

Chandrayaan-1 Data Suggests Electrons from Earth Forming Water on Moon

Scientists analysing the remote sensing data from India's Chandrayaan-1 lunar mission have found that high energy electrons from the Earth may be forming water on the Moon.

The team led by researchers from the University of Hawai'i (UH) at Manoa in the US discovered that these electrons in Earth's plasma sheet are contributing to weathering processes -- breaking down or dissolving of rocks and minerals -- on the Moon's surface.

The research, published in the journal Nature Astronomy, found that the electrons may have aided the formation of water on the lunar body.

Knowing the concentrations and distributions of water on the Moon is critical to understanding its formation and evolution, and to providing water resources for future human exploration, the researchers said. The new finding may also help explain the origin of the water ice previously discovered in the permanently shaded regions of the Moon, they said.

Chandrayaan-1 played a crucial role in the discovery of water molecules on the Moon. The mission, launched in 2008, was the first Indian lunar probe under the Chandrayaan programme.

Solar wind, which is composed of high energy particles such as protons, bombards the lunar surface and is thought to be one of the primary ways in which water has been formed on the Moon.

The team investigated the changes in surface weathering as the Moon passes through Earth's magnetotail, an area that almost completely shields the lunar body from solar wind but not the Sun's light photons.

"This provides a natural laboratory for studying the formation processes of lunar surface water," said Shuai Li, an assistant researcher at the UH Manoa School of Ocean.

"When the Moon is outside of the magnetotail, the lunar surface is bombarded with solar wind. Inside the magnetotail, there are almost no solar wind protons and water formation was expected to drop to nearly zero," Li said.

Li and co-authors analysed the remote sensing data that were collected by the Moon Mineralogy Mapper instrument, an imaging spectrometer, onboard India's Chandrayaan 1 mission between 2008 and 2009.

They, specifically, assessed the changes in water formation as the Moon traversed through Earth's magnetotail, which includes the plasma sheet.

"To my surprise, the remote sensing observations showed that the water formation in Earth's magnetotail is almost identical to the time when the Moon was outside of the Earth's magnetotail," said Li.

"This indicates that, in the magnetotail, there may be additional formation processes or new sources of water not directly associated with the implantation of solar wind protons. In particular, radiation by high energy electrons exhibits similar effects as the solar wind protons," he explained.

This finding and the team's previous study of rusty lunar poles indicate that the Earth is strongly tied with its Moon in many unrecognised aspects, the researchers added.

Chandrayaan 1 was launched by the Indian Space Research Organisation (ISRO) in October 2008, and operated until August 2009. The mission included an orbiter and an impactor.

India successfully landed Chandrayaan-3 mission, with a rover and a lander, near the Moon's enigmatic south pole last month, becoming the first country to do so.

<https://www.thehindu.com/news/national/chandrayaan-1-data-suggests-electrons-from-earth-forming-water-on-moon/article67310743.ece>

