

November
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 : 210

05-07 नवंबर 2022

Vol.: 47 Issue: 210

05-07 November 2022



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

CONTENTS

S. No.	TITLE	Page No.
	DRDO News	1-4
	DRDO Technology News	1-4
1.	DRDO ने बनाया ऐसा स्टील जो भारतीय युद्धपोतों को बनाएगी विध्वंसक, बचाएगी 3000 करोड़ की बचत	1 <i>पत्रिका</i>
2.	With Own Anti-Missile, India has Joined Select League of Nations. Here's A Look at India's BMD Programme	2 <i>ABP News</i>
	DRDO on Twitter	4-4
	Defence News	
	Defence Strategic: National/International	
3.	भारतीय सेना ने 'आत्मनिर्भरता को प्रोत्साहन देते हुए पांच मेक-II परियोजनाओं को मंजूरी दी	5 <i>पत्र सूचना कार्यालय</i>
4.	Indian Army Approves Five Make II Projects Providing Impetus to "Atma Nirbhaarta"	7 <i>Press Information Bureau</i>
5.	Indigenous Defence Units Respond to Innovation Challenge; 22 Projects in Prototype Development Stage	9 <i>Business Line</i>
6.	Maritime Partnership Exercise with Royal Australian Navy Conclude in the Bay of Bengal	10 <i>Press Information Bureau</i>
7.	Army Commanders' Conference Scheduled from 07 to 11 November 2022 at New Delhi	11 <i>Press Information Bureau</i>
8.	Arunachal Police Officers Receive Training in Mandarin	13 <i>The Economic Times</i>
9.	P81 Aircraft Delivered 'Valuable Strategic Communication' During IOR Operations: Navy Chief	12 <i>Business Line</i>
10.	चीन से सटी एलएसी पर दम दिखाने के लिए तैयार है, स्वदेशी कॉम्बैट हेलीकॉप्टर	14 <i>ए बी पी न्यूज़</i>
11.	Light Combat Helicopter to be Inducted into Aviation Brigade this Month	14 <i>The Tribune</i>
12.	Navy Plans to Stop Chinese Spy Ship from Entering India's Exclusive Economic Zone	15 <i>The Economic Times</i>
13.	India's Ballistic Missile Test Likely to be Deferred Owing to Presence of Chinese Research Vessel in Indian Ocean Region; Indian Navy Closely Monitoring Situation	16 <i>The Economic Times</i>
14.	Closely Monitoring Chinese Ship Since it Entered Indian Ocean: Ministry of Defence	17 <i>India TV</i>
15.	India's Chief of Naval Staff on Official Japan Visit Between November 5-9	18 <i>Financial Express</i>
16.	Navy Chief's Japan Visit to Focus on Boosting Bilateral Defence Ties	18 <i>News on Air</i>
17.	Why Everyone in Arms Industry Loves a Good War	19 <i>The Times of India</i>
18.	Global Data Study Identifies VAMPIRE Anti-Drone System an Cost Effective Option for Ukraine	21 <i>Financial Express</i>
19.	Japan PM Vows to Strengthen Military at int'l Naval Review	21 <i>The Daily Pioneer</i>

20.	South Korea Scrambles Stealth Jets after Detecting North Korean Warplanes	<i>Hindustan Times</i>	23
21.	North Korea Fires More Missiles as U.S. Flies Bombers Over South	<i>The Hindu</i>	24
Science & Technology News			25-28
22.	अब शुक्र ग्रह और सूर्य के अध्ययन की तैयारी में भारत, चांद के अनसुलझे रहस्यों का भी लगेगा पता	<i>जागरण</i>	25
23.	ISRO Plans to Explore Permanent Dark Side of Moon in Collaboration with Japan	<i>India.com</i>	27
24.	NASA's Moon Rocket Artemis I Ready for Another Launch Attempt	<i>The Print</i>	27



शनिवार, 05 नवंबर 2022

DRDO ने बनाया ऐसा स्टील जो भारतीय युद्धपोतों को बनाएगी विध्वंसक, बचाएगी 3000 करोड़ की बचत

भारतीय नौसेना की जरूरत पूरी करने के लिए रक्षा अनुसंधान व विकास संगठन (डीआरडीओ) ने ऐसा खास स्टील तैयार किया है जो न केवल पोतों का समय बढ़ा देगा बल्कि हमले की ताकत में भी बहुत इजाफा करेगा। डीआरडीओ ने इस स्टील का नाम 249ए और 249बी या है। इसके कारण अब नौ सेना के पोत ज्यादा समय तक पानी में तैर पाएंगे। आत्मनिर्भर भारत की मुहिम रंग लाने लगी है। सैन्य संस्थानों ने एक के बाद एक लक्ष्य का साधने का काम किया है। फिर चाहे वे तेजस निर्माण की बात हो या फिर जंगी पोत के जलावतरण की। हर तरफ भारतीय संस्थानों का बोलबाला है। भारतीय नौसेना की जरूरत पूरी करने के लिए रक्षा अनुसंधान व विकास संगठन (डीआरडीओ) ने ऐसा खास स्टील तैयार किया है जो न केवल पोतों का समय बढ़ा देगा बल्कि हमले की ताकत में भी बहुत इजाफा करेगा। डीआरडीओ ने इस स्टील का नाम 249ए और 249बी या है। इसके कारण अब नौ सेना के पोत ज्यादा समय तक पानी में तैर पाएंगे।

खास इस्तेमाल हुआ शुरू

नौसेना के विभिन्न प्रोजेक्ट्स में यह सटील इस्तेमाल शुरू कर दिया गया है। इसके कारण नौसेना को 3000 करोड़ रुपए की बचत हुई है। पहले इसे आयात किया जाता था। इसके उत्पादन के स्टील अथॉरिटी ऑफ इंडिया सहित कुछ और इस्पात कंपनियों से हाथ मिलाया गया है। इससे केंद्र सरकार की आत्मनिर्भर भारत मुहिम को भी बल मिला है।

अब सभी युद्धपोत में यही स्टील

आइएनएस कोलकाता श्रेणी के तीन विध्वंसक (डेस्ट्रॉयर), आइएनएस विशाखापत्तनम श्रेणी के एक विध्वंसक और विमानवाहक पोत आइएनएस विक्रान्त में ये स्टील लगाए गए हैं। चार जंगी पोत मड़गांव

डॉक में बनाए गए हैं। मझगांव गोदी में विशाखापत्तनम श्रेणी के तीन युद्धपोत और चार निर्माणाधीन अन्य जलयान में यही लगाया जा रहा है।

विक्रांत का रनवे में बनाने में हुआ इस्तेमाल

भारतीय नौ सेना के हाल में ही लांच किए गए विमानवाहक युद्ध पोत आईएनएस विक्रांत का रनवे बनाने के लिए 249बी स्टील का इस्तेमाल किया गया। युद्धपोतों में स्टील सबसे अहम होता है। नौ सेना के लिए स्टील विकसित करने का काम डीआरडीओ ने 2008 में शुरू किया था।

<https://www.patrika.com/jaipur-news/drdo-made-such-steel-that-will-make-indian-warships-save-3000-crores-7852717/>



Sun, 06 Nov 2022

With Own Anti-Missile, India has Joined Select League of Nations. Here's A Look at India's BMD Programme

With the successful maiden flight test of the second phase of the ballistic missile defence (BMD) interceptor on November 2 from the APJ Abdul Kalam Island off the coast of Odisha, India has achieved a major milestone in the ultimate deployment of the indigenously developed anti-missile system, which is capable of targeting and neutralising an incoming long-range intercontinental ballistic missile (ICBM) fired by the enemy. The necessity to acquire such an anti-missile system was felt after the 1999 Kargil War, when Pakistan threatened India with its nuclear tipped intermediate range missiles, and also to tackle perceived threats from China, which possesses hundreds of such ICBMs and has also deployed them in the Tibet area directed against Indian cities.

On October 14, India stunned the world with the successful launch of submarine launched ballistic missile K-15, but developing an anti-missile system is much more complex than an offensive missile system and requires very advanced expertise in cutting-edge defence technologies. DRDO utilised the available talent in India and could achieve the feat indigenously. In spite of various strict international sanction regimes, especially directed against India, Indian missile scientists were able to equip the country's armed forces with short, intermediate and long-range ballistic missiles ranging from Prithvi of 300-km range to the intercontinental ballistic missiles of Agni series with a range of over 5,000 km. However, since India is surrounded by inimical forces, who have also acquired offensive missile systems, it was imperative for Indian strategic planners to hand over such defensive systems to the armed forces, which can destroy an incoming attacking missile high in the sky. This will save the nation from nuclear blackmail.

With technology sanctions regimes like the Missile Technology Control Regime (MTCR) in operation, India could not have availed any assistance even from friendly countries like Russia in developing very advanced missile defence systems. Hence, Indian missile scientists chalked out their own anti-missile development programme. The ambitious missile defence programme was launched in 2000 and since then many successful tests under Phase-1 of the BMD had been conducted, giving confidence to the scientists to go ahead with much more complex longer-range anti-missile systems.

Origin of Anti-Missile Systems and How AD-1 Works

According to a defence ministry official, the November 2 flight test was carried out with the participation of all BMD weapon system elements located at different geographical locations. Named Air Defence-1 (AD-1), the missile is a long-range interceptor missile designed for both the low exo-atmospheric and endo-atmospheric interception of long range ballistic missiles as well as fighter aircraft. The AD-1 is propelled by a two-stage solid motor and equipped with indigenously developed advanced control systems, navigation and guidance algorithm to precisely guide the vehicle to the target. Defence Minister Rajnath Singh described AD-1 as a unique interceptor with advanced technologies available with very few nations in the world. According to DRDO Chairman Dr SV Kamat, AD-1 will provide great operational flexibility to the users and have capability to engage many different types of targets.

Anti-missile systems appeared on the war front for the first time during the Gulf War in the early nineties when US forces deployed Patriot missile systems to destroy Iraqi Scud missiles. Later, the US released other much more advanced versions of Patriot, Aegis and THAAD (Terminal High Altitude Area Defence) systems. THAAD came under spotlight when the US decided to deploy them on the Polish borders with Russia and in South Korea to counter North Korean missiles. Russia and China had objected to the deployment of THAAD on their borders. Similarly, Pakistan has also expressed concerns over the Indian anti-missile development programme, as it would make Pakistani ballistic missiles infructuous.

Though Indian missile scientists have successfully completed Phase-1 of the anti-missile development programme, the armed forces had to wait for the completion of the final phase of the BMD programme, in view of the magnanimity of the threats faced. Under Phase 1, the interceptors had a limited range of 15 km to 80-100 km, and would have been able to tackle only intermediate range ballistic missiles, whereas India also faces a huge threat from long-range intercontinental ballistic missiles. Hence, until the development and deployment of such indigenous anti-missile systems, Indian policymakers decided to acquire the Russian S-400 anti-missile system, for which India had to spend a huge sum of over US\$ 5 billion so as to deter the adversaries from threatening India with missile attacks.

However, Indian officials believe that the results of the November 2 test are very encouraging and have generated confidence among policy planners to issue green signal for further tests and final sealing of the design. Indian officials also believe that India would no longer need to import such a system. The new interceptor will require a few more tests to validate various design parameters, after which the Phase-2 interceptor missile is expected to begin production for actual deployment within the next few years.

Though India is a latecomer in this interceptor missile race, it has still joined a select league of nations like the US, Russia and Israel that have deployed such systems. Though a BMD Program is under way in China, the Communist giant has never announced any progress in this field. China's inability to develop such complicated very advanced anti-missile systems is obvious from the fact that it had to acquire the Russian S-400 anti-missile systems in large numbers. In view of the high costs, India decided to acquire only five such systems. The delivery of S-400 to India has already begun, which is likely to be completed by the end of next year. Deployment of defensive missile systems is an extremely costly affair. However, in view of rising threat perception from India's neighbouring countries, the strategic planners had to continue with the interceptor missile development programme.

<https://news.abplive.com/india-at-2047/with-own-anti-missile-india-has-joined-select-league-of-nations-understanding-ballistic-missile-defence-bmd-programme-india-1561699>

DRDO on Twitter





पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

शुक्रवार, 04 नवंबर 2022

भारतीय सेना ने 'आत्मनिर्भरता को प्रोत्साहन देते हुए पांच मेक-II परियोजनाओं को मंजूरी दी

भारतीय सेना स्वदेशी विकास के माध्यम से विशिष्ट प्रौद्योगिकियों को लाने वाले "मेक प्रोजेक्ट्स" को प्रोत्साहन प्रदान करने के लिए कार्य कर रही है। फिलहाल जारी परियोजनाओं को और बढ़ावा देने के लिए भारतीय सेना ने अब पांच मेक II परियोजनाओं के परियोजना स्वीकृति आदेश (पीएसओ) को मंजूरी दे दी है। मेक II परियोजनाएं अनिवार्य रूप से उद्योग द्वारा वित्त पोषित परियोजनाएं हैं जिनमें प्रोटोटाइप के विकास के लिए भारतीय विक्रेताओं द्वारा डिजाइन एवं विकसित किए गए अभिनव समाधान शामिल हैं। सफल प्रोटोटाइप विकास के बाद आदेश का आश्वासन दिया जाता है।

निम्नलिखित परियोजनाएं हैं जिनके पीएसओ को मंजूरी दी गई है: -

हाई फ्रीक्वेंसी मैन पैकड सॉफ्टवेयर डिफाइंड रेडियो (एचएफएसडीआर)

14 विकासशील एजेंसियों (डीए) को मेक II योजना के तहत फ्रीक्वेंसी मैन पैकड सॉफ्टवेयर डिजाइन रेडियो (एचएफएसडीआर) के प्रोटोटाइप के विकास के लिए परियोजना स्वीकृति आदेश (पीएसओ) जारी किया गया है। प्रोटोटाइप के सफल विकास पर भारतीय सेना द्वारा 300 एचएफएसडीआर खरीदने की योजना है। अत्याधुनिक, हल्के वजन वाले एचएफएसडीआर बड़ी हुई सुरक्षा के साथ-साथ बड़ी हुई डेटा क्षमता और बैंड विड्थ के माध्यम से लंबी दूरी का रेडियो संचार प्रदान करेगा। यह जीआईएस का उपयोग करके मानचित्र आधारित नेविगेशन के साथ ब्लू फोर्स ट्रैकिंग की सुविधा प्रदान करेगा, जिससे वास्तविक समय में स्थितिजन्य जागरूकता बढ़ेगी। ये रेडियो सेट फिलहाल इन्वेंट्री में मौजूदा एचएफ रेडियो सेटों की जगह लेंगे, जिनमें सीमित डेटा हैंडलिंग क्षमता और पुरानी पड़ चुकी तकनीक है।

ड्रोन किल सिस्टम

RPAS/s ने आधुनिक युद्धक्षेत्र को बहुत प्रभावित किया है, भले ही ड्रोन से संबंधित प्रौद्योगिकियां लगातार विकसित हो रही हैं। इस क्षेत्र में विश्व स्तर के उत्पादों को विकसित करने के लिए स्वदेशी उद्योग के पास पर्याप्त विशेषज्ञता है। स्वदेशी ड्रोन रोधी पारितंत्र को और प्रोत्साहित करने के प्रयासों के तहत, भारतीय सेना ने प्रोटोटाइप के सफल विकास के बाद मेक II योजना के तहत ड्रोन किल सिस्टम के 35 सेटों की खरीद के लिए 18 विकासशील एजेंसियों (डीए) को परियोजना स्वीकृति आदेश (पीएसओ) को मंजूरी दी है। यह परियोजना एमएसएमई/स्टार्ट-अप के लिए आरक्षित है। ड्रोन किल सिस्टम कम रेडियो क्रॉस सेक्शन (आरसीएस) ड्रोन/मानव रहित एरियल सिस्टम (यूएस) के खिलाफ एक हार्ड किल एंटी ड्रोन सिस्टम है, जिसे दिन और रात दोनों समय सभी प्रकार के इलाकों में काम करने के लिए विकसित किया जा रहा है **इन्फैंट्री ट्रेनिंग वीपन सिम्युलेटर (आईडब्ल्यूटीएस)**

मेक II प्रक्रिया के तहत आईडब्ल्यूटीएस के 125 सेटों की खरीद के लिए प्रोटोटाइप विकसित करने के लिए चार विकासशील एजेंसियों (डीए) को परियोजना स्वीकृति आदेश (पीएसओ) जारी किया गया है। आईडब्ल्यूटीएस भारतीय सेना के साथ प्रमुख सेवा के रूप में पहली ट्राई-सर्विस मेक II परियोजना है। परियोजना एमएसएमई/स्टार्ट अप के लिए आरक्षित है। आईडब्ल्यूटीएस का उपयोग विभिन्न प्रकार के हथियारों पर युवा सैनिकों के निशानेबाजी कौशल को बढ़ाने के लिए किया जाएगा, यह युद्ध की स्थितियों के अनुरूप उपयोगकर्ता के अनुकूल ग्राफिक्स प्रदान करते हैं। आईडब्ल्यूटीएस एक आधुनिक प्रशिक्षण सुविधा है, जो गोला-बारूद पर बार-बार होने वाले खर्च को कम करने के अलावा फायरिंग रेंज की उपलब्धता और खराब मौसम की चुनौतियों से भी निजात दिलाएगी। प्रत्येक आईडब्ल्यूटीएस किसी भी समय 10 कर्मियों के प्रशिक्षण की सुविधा प्रदान करेगा।

155 मिमी टर्मिनली गाइडेड मुनिशन (टीजीएम)

मेक II योजना के तहत 155 मिमी टर्मिनली गाइडेड मुनिशन (टीजीएम) के विकास के लिए छह विकासशील एजेंसियों (डीए) को परियोजना स्वीकृति आदेश जारी किया गया है। सटीक स्ट्राइक क्षमता के बिना भारतीय सेना की सूची में गोला-बारूद के वेरिएंट रखे गए थे। इसलिए भारतीय सेना ने मिशन की उपलब्धि और न्यूनतम संपार्श्विक क्षति के लिए सुनिश्चित सटीकता और घातकता के साथ हाई वैल्यू टारगेट्स के खिलाफ 155 मिमी टीजीएम के लगभग 2000 राउंड की खरीद करने की योजना बनाई है।

मीडियम रेंज प्रिसिशन किल सिस्टम (एमआरपीकेएस)

डीएपी 2020 के मेक-II श्रेणी के तहत एमआरपीकेएस का एक प्रोटोटाइप विकसित करने के लिए 15 विकासशील एजेंसियों (डीए) को परियोजना स्वीकृति आदेश जारी किया गया है। इस प्रोटोटाइप के सफल विकास के बाद भारतीय सेना एमआरपीकेएस के 10 सेट खरीदेगी। मीडियम रेंज प्रिसिशन किल सिस्टम (एमआरपीकेएस), एक बार लॉन्च होने के बाद दो घंटे तक हवा में 'लॉइटर' कर सकता है

और 40 किमी तक की दूरी तक हाई वैल्यू टारगेट्स को रीयल टाइम ट्रैक कर उन पर निशाना साध सकता है। आने वाले समय में हम देखते हैं कि हमारा देश लोडिंग म्यूनिशन टेक्नोलॉजी में "आत्मनिर्भर" देश के रूप में बदल रहा है। भारतीय सेना पहले से ही पूंजी अधिग्रहण की मेक II प्रक्रिया के तहत जारी 43 परियोजनाओं को आगे बढ़ा रही है। 43 में से 17 परियोजनाओं को उद्योग से प्राप्त स्व-प्रेरणा प्रस्तावों के माध्यम से शुरू किया गया है, जिसने "मेक प्रक्रिया" में भाग लेने के लिए भारतीय रक्षा उद्योग में उत्साह और विश्वास पैदा किया है।

मेक II खरीद योजना ने विभिन्न प्रकार की हथियार प्रणालियों, गोला-बारूद और आधुनिक प्रशिक्षण प्रणालियों, जो वर्तमान में देश में उपलब्ध नहीं हैं, में उच्च स्तरीय प्रौद्योगिकी प्रणालियों के स्वदेशीकरण की प्राप्ति हेतु रक्षा उद्योग में डिजाइन और विकास को बढ़ाने के लिए प्रोत्साहन दिया है। फिलहाल जारी मेक II परियोजनाओं में तेजी लाने के अनेक उपायों के ठोस परिणाम सामने आए हैं। कुल 43 मेक II परियोजनाओं में से 22 अब प्रोटोटाइप विकास चरण में हैं, जो कि लागत के हिसाब से परियोजनाओं का 66% (27,000 करोड़ में से 18,000 करोड़ रुपये) है।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1873790>



Press Information Bureau
Government of India

Ministry of Defence

Fri, 04 Nov 2022

Indian Army Approves Five Make II Projects Providing Impetus to “Atma Nirbhaarta”

Indian Army is spearheading actions to provide impetus to “Make Projects” as the prime drivers of infusion of niche technologies through indigenous development. To give a further boost to the ongoing projects, Indian Army has now approved Project Sanction Orders (PSOs) of five Make II projects. Make II projects are essentially Industry funded projects involving design, development and innovative solutions by Indian vendors for development of prototypes. An assurance of order is given after successful prototype development.

Following are the projects whose PSOs have been approved:-

High Frequency Man Packed Software Defined Radio (HFSDR)

Project Sanction Order (PSO) for development of prototype of Frequency Man Packed Software Defined Radio (HFSDR) under Make II scheme has been issued to 14 Developing Agencies (DAs). 300 HFSDRs are planned to be procured by the Indian Army, on successful development of the prototype. State of the art, light weight HFSDR will provide long distance radio communication through enhanced data capability and band width coupled with enhanced security. It will facilitate blue force tracking with map based navigation using GIS, thereby

increasing real time situational awareness. These radio sets will replace the existing HF radio sets in the inventory, which have limited data handling capability and obsolete technology.

Drone Kill System

RPAS/ s have greatly impacted the modern battlefield even though drone related technologies are constantly evolving. The indigenous industry has adequate expertise to develop world class products in this field. As part of efforts to further encourage the indigenous anti-drone ecosystem, the Indian Army has approved Project Sanction Order (PSO) to 18 Developing Agencies (DAs) for procurement of 35 sets of Drone Kill Systems under the Make II scheme, post successful development of Prototype. The project is reserved for MSMEs/Start-ups. Drone Kill System is a hard kill anti drone system against low Radio Cross Section (RCS) Drone/ unmanned Aerial System (UAS), being developed to function in all types of terrains, both during day and night.

Infantry Training Weapon Simulator (IWTS)

Project Sanction Order (PSO) has been issued to four Developing Agencies (DAs) to develop the prototype for subsequent procurement of 125 sets of IWTS under the Make II procedure. The IWTS is the first tri service Make II project with the Indian Army as the lead service. The project is reserved for MSMEs/ Start ups. IWTS will be utilised to augment marksmanship skills of young soldiers on variety of weapons used by the , providing user friendly graphics to simulate battle scenarios. IWTS is a modern training aid, which will reduce recurrent expenditures on live ammunition, besides obviating the challenges of availability of firing ranges and inclement weather. Each IWTS will facilitate training of 10 personnel at any one point of time.

155mm Terminally Guided Munitions (TGM)

Project Sanction Order has been issued to six Developing Agencies (DAs) for development of 155 mm Terminally Guided Munition (TGM) under Make II scheme. Variants of ammunition were held in the inventory of the IA, sans, the precision strike capability. The IA therefore plans to procure approximately 2000 rounds of 155mm TGM against High Value Targets with assured Precision and Lethality for mission accomplishment and minimum collateral damage.

Medium Range Precision Kill System (MRPKS)

Project Sanction Order has been issued to 15 Developing Agencies (DAs) for developing a prototype of MRPKS under the Make-II category of DAP 2020. Post successful development of this prototype, the IA will procure 10 Sets of MRPKS. The Medium Range Precision Kill System (MRPKS), once launched can 'Loiter' in the air for up to two hours and can acquire, designate and engage real time high value targets up to 40 km. In times to come we see our country transforming as "AtmaNirbhaar" in Loitering Munition Technology. The Indian Army is already progressing 43 ongoing projects under the Make II procedure of Capital Acquisition. 17 out of 43 projects have been initiated through suo-moto proposals received from the industry, which has generated enthusiasm and confidence in the Indian defence industry for participation in the "Make procedure".

Make II procurement scheme has given an impetus to increase the Design & Development in the defence industry to achieve indigenization of high end technology systems in various types of weapon systems, ammunition and modern training systems, which are currently not available in the country. Multiple measures to expedite the ongoing Make II projects have resulted in

tangible outcomes. 22 out of 43 Make II projects are now in prototype development stage, which is 66 % of projects by cost (Rs 18,000 Crores out of 27,000 Crores).

<https://pib.gov.in/PressReleasePage.aspx?PRID=1873674>

THE HINDU BusinessLine

Fri, 04 Nov 2022

Indigenous Defence Units Respond to Innovation Challenge; 22 Projects in Prototype Development Stage

Drone kill system, software defined radio sets, infantry training weapon simulator, terminally guided munition and medium range precision kill system are five projects approved by Army for industry to design, develop and innovate solutions for making prototypes for each of them. An assurance of order will be given after successful prototype development by indigenous vendor, said the Ministry of Defence (MoD). “Multiple measures to expedite the ongoing Make II projects (through indigenous industry) have resulted in tangible outcomes. 22 out of 43 Make II projects are now in prototype development stage, which is 66 per cent of projects by cost (Rs 18,000 Crores out of Rs 27,000 Crores).” The Ministry of Defence informed that 17 out of 43 projects have been initiated through suo-moto proposals received from the industry, which has generated enthusiasm and confidence in the Indian defence industry for participation in the “Make procedure”.

Facilitate tracking

The Army has issued project sanction order (PSO) for development of prototype of Frequency Man Packed Software Defined Radio (HFSDR) under Make II to 14 developing agencies as the force plans to procure 300 of radio sets for long distance communication and to replace existing HF sets, which have limited data handling capability and obsolete technology. State of the art, light weight HFSDR will facilitate blue force tracking with map-based navigation using GIS, thereby increasing real time situational awareness, said the Ministry. The Ministry said that innovation of the drone kill system has been reserved for MSMEs and start-ups and PSO has been issued to 18 developing agencies for procurement of 35 sets under the Make II scheme. Drone Kill System, elaborated the MoD, is a hard kill anti drone system against low Radio Cross Section (RCS) Drone/ Unmanned Aerial System (UAS), being developed to function in all types of terrains, both during day and night.

Reduce expenditure

Likewise, for the Infantry Training Weapon Simulator (IWTS), PSO has been issued to 4 developing agencies for making the prototype for subsequent procurement of 125 sets simulators which will not only augment marksmanship skill of young soldiers but reduce expenditure on firing, the ministry stated. Each IWTS will facilitate training of 10 personnel at any one point of time. Given the Army’s requirement to procure approximately 2000 rounds of 155mm terminally guided munitions (TGM) against high value targets with assured precision and lethality for

mission accomplishment, the ministry said, PSO has been issued to 6 developing agencies (DAs) for their development.

Army has also issued PSO to 15 developing agencies (DAs) for developing a prototype of medium range precision kill system (MRPKS) given their demand for ten such sets. The Medium Range Precision Kill System (MRPKS), once launched can 'loiter' in the air for up to two hours and can acquire, designate and engage real time high value targets up to 40 km, stated the MoD as it believes that India will be able to achieve self-reliance in this area of weapon system development.

<https://www.thehindubusinessline.com/news/indigenous-defence-units-respond-to-innovation-challenge-22-projects-in-prototype-development-stage/article66096711.ece>



Press Information Bureau
Government of India

Ministry of Defence

Sat, 05 Nov 2022

Maritime Partnership Exercise with Royal Australian Navy Conclude in the Bay of Bengal

A Maritime Partnership Exercise involving Royal Australian Navy(RAN) ships HMAS Adelaide and HMAS Anzac and Indian Navy Ships Jalashwa and Kavaratti along with their embarked helicopters was held in the Bay of Bengal from 02 to 03 Nov 2022. The exercises included tactical manoeuvres, helicopter landings and amphibious operations, which signified the high degree of interoperability between IN and RAN. RAN ships HMAS Adelaide and HMAS Anzac visited Visakhapatnam from 30 Oct to 01 Nov 2022.

This was part of Australia's Indo-Pacific Endeavour 2022 (IPE 22). The Australian Defence Forces were hosted by the Eastern Naval Command. Ships of the Indian Navy's Eastern Fleet as also personnel from the Indian Army and the Indian Air Force participated in various joint activities. The harbour phase included a wide range of professional interactions including experience sharing, joint planning activities and friendly sports exchanges. The successful completion of the exercise marks another milestone in the growing India-Australia military interactions.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1873957>



**Press Information Bureau
Government of India**

Ministry of Defence

Sat, 05 Nov 2022

Army Commanders' Conference Scheduled from 07 to 11 November 2022 at New Delhi

Army Commanders' Conference (ACC) is an apex-level biannual event which is an institutional platform for conceptual level deliberations, culminating in making important policy decisions for the Indian Army. The second ACC for the year 2022 is scheduled from 07 to 11 November 2022 at New Delhi. The event which is attended by senior officers of the Indian Army including the COAS, VCOAS, all Army Commanders and other senior officers is also a formal forum for the senior leadership of the Indian Army to interact with the senior officials of the Department of Military Affairs and Department of Defence. During the course of the conference, the apex leadership of Indian Army will brainstorm on current/emerging security and administrative aspects to chart the future course for the Indian Army.

Discussions pertaining to transformational imperatives for a future ready force, progress on capability development & modernisation, framework for enhanced operational effectiveness of Indian Army, changes being incorporated to promote Atmanirbharta, implementation of the new Human Resource management policy and future challenges to progressive military training will form part of the deliberations. In-depth discussions on various agenda points projected by the Army Commanders, including an update by CINCAN and briefings on various issues by the various Principal Staff Officers are also scheduled. Other activities planned during the conference also include talks by eminent subject experts on "Contemporary India - China relations" as well as "Technological Challenges for National Security". During the conference, the Raksha Mantri Shri Rajnath Singh is scheduled to address and interact with the Army Commanders on 10 November 2022. The Chief of Defence Staff and the Chiefs of the Indian Navy and the Indian Air Force are also scheduled to address the senior leadership of Indian Army on avenues for promoting tri-service synergy.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1873881>

THE ECONOMIC TIMES

Sun, 06 Nov 2022

Arunachal Police Officers Receive Training in Mandarin

Rashtriya Raksha University has trained first batch of 16 police officers from Arunachal Pradesh in Chinese language, that is Mandarin, and is in the process of imparting similar training to the personnel of Indo-Tibetan Border Police and Himachal and Ladakh police, ET has learnt. Speaking to ET, university's outreach officer Kumar Sabyasachi said: "RRU's purpose is to provide holistic security and strategic education for overall national security. We have trained

16 Arunachal police officers who are deployed in border areas in Chinese language and have signed a memorandum of understanding with Arunachal Pradesh government to set up our branches in Pasighat.” The centre was opened in May this year.

Sabyasachi added, “RRU is in discussion with ITBP, Himachal and Ladakh administration to impart language training to their officers and set up centres in border states to overcome challenges faced by border police.” There have been several instances of standoff and faceoff between the patrolling units of India and China due to the language issues. The training will also help the forces in intelligence gathering, officials said. The Indian Army along with ITBP is primarily responsible for guarding the Line of Actual Control (LAC) with China. ITBP is deployed along the 3,488-kilometre India-China border. Ladakh, Himachal Pradesh, Sikkim and Arunachal share borders with China. The 2020 military standoff and skirmishes between the Chinese and Indian forces were reported at various locations along the borders, including Pangong Lake and Galwan in Ladakh. As many as 20 soldiers including a Colonel were killed in the violent clashes in Ladakh. Indian and Chinese forces have recently completed the disengagement process, but disputes remain, with China’s People’s Liberation Army continuing to block India’s access to traditional patrolling areas along LAC in the Depsang Plains and Charding Nala.

The Gandhinagar-based university was earlier known as Raksha Shakti University and was set up in 2010 by the Gujarat government when Narendra Modi was the chief minister. It was given a national university status through the Rashtriya Raksha University Act passed by Parliament in October 2020. Besides Arunachal, the university has signed agreements with the Uttar Pradesh government, National Security Guards, Indian Navy and Delhi Police for providing training and knowledge in various fields related to policing and security. According to the university, as many as 1,000 students are enrolled at the Gandhinagar branch and 40 at the Pasighat centre.

<https://economictimes.indiatimes.com/news/defence/arunachal-police-officers-receive-training-in-mandarin/articleshow/95342413.cms>

THE HINDU
BusinessLine

Fri, 04 Nov 2022

P81 Aircraft Delivered ‘Valuable Strategic Communication’ During IOR Operations: Navy Chief

Navy chief Admiral R Hari Kumar on Thursday said the P8I, an anti-submarine, long-range reconnaissance aircraft, has delivered “valuable strategic communication” in operations across the Indian Ocean Region (IOR). He cautioned Naval Commanders about the rise of non-state actors and the expanding influence of large corporations which, “continue to influence our strategic and security calculus”. The P81, inducted into the Navy in 2013, has long-range surveillance, electronic warfare, imagery intelligence, ASW missions and search and rescue capabilities, employing a modern mission suite and sensors.

Winding up the second edition of the Naval Commanders’ Conference, Admiral Kumar said, “Terrorism, guns and narcotics smuggling, and other such threats will continue to pose

challenges. Therefore, while ensuring broader maritime security, coastal security, LND, and harbour defence will also place demands on us and would require focused attention of all Operations Commanders”. He said the security situation is evolving rapidly, and the changes will need to be factored into everything we do – planning, deployment, maintenance, and human resource development. “In navigating the turbulent security scenario, I am convinced that remaining a ‘Combat Ready, Credible, Cohesive and Future Proof Force’, is vital,” he told his top brass. He dwelled upon the achievements of the last six months and said operational deployments have emphasised our credibility, with a footprint covering all the major oceans.

He recalled the maiden concurrent deployment of our ships across six continents on Independence Day this year, “served as valuable signalling to underscore our credibility – at home, in the region, and across the world”. Chief of Defence Staff General Anil Chauhan, in his maiden address to the naval commanders, reiterated the need for operational preparedness, Aatmanirbharta and further integration in the armed forces, to collectively meet India’s national security imperatives. The Chief of Army Staff, the Chief of Air Force Staff and the Chief of Integrated Defence Staff to the Chairman, and the Chiefs of Staff Committee (CISC) also interacted with the Naval Commanders and discussed avenues to further augment Tri-Services synergy and readiness. Along the sidelines of the conference, the Naval Commanders also interacted with ‘Think Tanks’ on strategic issues.

<https://www.thehindubusinessline.com/news/p81-aircraft-delivered-valuable-strategic-communication-during-ior-operations-navy-chief/article66092251.ece>



रविवार, 06 नवंबर 2022

चीन से सटी एलएसी पर दम दिखाने के लिए तैयार है, स्वदेशी कॉम्बैट हेलीकॉप्टर

पाकिस्तान सीमा पर अपनी ताकत दिखाने के बाद स्वदेशी कॉम्बैट हेलीकॉप्टर (LCH) अब चीन से सटी एलएसी पर दम दिखाने के लिए तैयार हैं. भारतीय सेना लाइट कॉम्बैट हेलीकॉप्टर (एलसीएच)-प्रचंड की पहली स्क्वाड्रन असम के मिसामारी में तैनात करने की तैयारी कर रही है जहां से अरुणाचल प्रदेश से सटी चीन सीमा की निगहबानी की जाती है. जानकारी के मुताबिक, इसी महीने एलसीएच-प्रचंड (Light Combat Helicopter) की इंडक्शन सेरेमनी मिसामारी बेस पर होने जा रही है. असम के सोनितपुर इलाके के मिसामारी बेस पर थलसेना की एविएशन कोर का पहले से ही एक बड़ा बेस है और यहां एडवांस लाइट हेलीकॉप्टर (एलएच) और इजरायल से लिए गए हेरॉन ड्रोन तैनात रहते हैं. यही वजह है कि थलसेना अपने प्रचंड हेलीकॉप्टर की यूनिट को यहां तैनात करने जा रही है

पहली खेप में कितने एलसीएच हेलीकॉप्टर मिलने हैं?

भारतीय सेना को पहली खेप में पांच एलसीएच हेलीकॉप्टर मिलने हैं। इनमें से एक पहले ही मिल चुका है और जल्द ही बाकी भी मिलने वाले हैं। हाल ही में वायुसेना ने प्रचंड हेलीकॉप्टर की पहली यूनिट को पाकिस्तानी सीमा के करीब जोधपुर एयर बेस पर तैनात की थी। 3 अक्टूबर को प्रचंड की इंडक्शन सेरेमनी में खुद रक्षा मंत्री राजनाथ सिंह शामिल हुए थे।

कितने हेलीकॉप्टर किस सेना के लिए

प्रधानमंत्री नरेंद्र मोदी की अध्यक्षता वाली सुरक्षा की कैबिनेट कमेटी (सीसीएस) ने इसी साल मार्च में 15 स्वदेशी लाइट अटैक हेलीकॉप्टर (एलसीएच) खरीदने की मंजूरी दी थी। 3387 करोड़ में ये हेलीकॉप्टर एचएएल से खरीदे गए हैं। इनमें से 10 हेलीकॉप्टर वायुसेना के लिए हैं और 05 भारतीय सेना (थल सेना) के लिए हैं। वायुसेना को अब तक 04 एलसीएच मिल चुके हैं जबकि थलसेना को एक मिले है।

एलसीएच हेलीकॉप्टर की खासियत

अधिकारियों ने बताया, हल्के लड़ाकू हेलिकॉप्टर हर मौसम में दुश्मन का मुकाबला करने में सक्षम हैं। ये हेलिकॉप्टर अधिक सक्रिय, गतिशील, एक्सटेंडेड रेंज, ऊंचाई के इलाकों, चौबीसों घंटे तैनाती, सर्च और रेस्क्यू, दुश्मन के एयर डिफेंस पर हमला और काउंटर इमरजेंसी ऑपरेशन में अहम भूमिका निभाने में सक्षम हैं।

<https://www.abplive.com/news/india/indian-defence-news-light-combat-helicopter-lch-rajnath-singh-difence-minister-ann-2252415>

The Tribune

Sun, 06 Nov 2022

Light Combat Helicopter to be Inducted into Aviation Brigade this Month

The Indian Army is set to operationalise the first squadron of indigenous Light Combat Helicopter (LCH) this month. It will be based at Missamari air base in Assam and will be part of the aviation brigade tasked to defend the strategically vital western part of Arunachal Pradesh. Missamari is located on the foothills of the Himalayas and is tasked to defend, among other places, the Tezpur-Bomdila-Tawang-Bum La axis. China had invaded the same route in 1962. The LCH was inducted into the Indian Air Force in October. Simultaneously, five copters were handed over to the Army Aviation Brigade. The copters have reached Missamari and are being integrated with other assets of the brigade before a formal induction that will take place later this month.

Powered by two Turbomeca Shakti engines, the copter has a service ceiling of 6,500 meters (21,000 ft), making it ideal to fly over the highest of Himalayan passes. The 5.8-tonne helicopter carries a turret gun, a rocket firing system and air-to-air missiles. The copter can be used against enemy tank formations, infantry and also unmanned aerial vehicles (UAVs). The fuel tanks of the copter are self-sealing and the pilots will be protected behind a bulletproof glass shield. It has a built-in crashworthiness of landing gear, crew seats and fuel tanks. It carries an onboard electronic warfare. The display panel is compatible to allow pilots wearing night vision goggles to see the display. The Army Aviation Brigade at Missamari was raised in March last year. It has a squadron of weapon system integrated (WSI) version of the Advanced Light Helicopter (ALH) carrying the mistral air-to-air missiles. The copter can handle reconnaissance, troop transport, anti-tank warfare and close air support.

A unit of ALH copters is also part of the brigade for logistics needs. A specialised UAV unit of the brigade is tasked to keep an eye on the Line of Actual Control (LAC). The UAV maintains surveillance and provides real-time imagery to commanders on the ground in forward areas. The Army Aviation and the Indian Air Force have joined hands for future operations. The IAF's US-made Chinook and the Russia-made Mi17 helicopters are co-located with the Army Aviation as part of the effort to quickly deploy troops in the valleys of Arunachal Pradesh. Historically, Missamari air base was used by the allied forces to transport personnel, supplies and equipment between India and Kunming, China, during World War II.

<https://www.tribuneindia.com/news/nation/light-combat-helicopter-to-be-inducted-into-aviation-brigade-this-month-448317>

THE ECONOMIC TIMES

Sun, 06 Nov 2022

Navy Plans to Stop Chinese Spy Ship from Entering India's Exclusive Economic Zone

The Indian Navy will not allow the Yuan Wang-6 to enter the country's Exclusive Economic Zone (EEZ) that extends up to 200 nautical miles into the sea. Though it is a known fact that the Yuan Wang-6 is a spy ship of the People's Liberation Army Navy (PLAN), sent to the Indian Ocean Region to track India's missile tests from the APJ Abdul Kalam Island off the Odisha coast, it is officially registered as a research and survey vessel. While foreign vessels, including warships, can freely sail through the EEZ, Indian law forbids any survey, research or exploration there by a foreign nation without permission. In 2019, the Indian Navy forced the Chinese research vessel Shi Yan 1 out of India's EEZ after it was found lurking near Port Blair. The Shi Yan 1 is also considered a PLAN spy ship masquerading as a research vessel. That move by the Indian Navy had led to a diplomatic row with China but India had put her foot down.

According to sources, the Indian Navy will do the same this time around if the Yuan Wang-6 attempts to enter India's EEZ. The destination of this vessel is not marked to any port but to 'open sea' and that is where she will have to remain, a senior official said. "We are constantly monitoring her every movement. Our surface and sub-surface assets are tracking the Yuan Wang-6. So are our Unmanned Aerial Vehicles (UAVs) and long-range maritime surveillance

aircraft. In fact, we are also in a position to find out what this ship is tracking. Though we can't do anything till she is in the open seas, action can be taken once she attempts to enter our EEZ. Had she been a normal PLAN warship, we could have done nothing due to the international right to passage laws.

"However, a foreign survey and research vessel can't be allowed to operate in our EEZ. She won't be able to get close to our coastline. We know that Yuan Wang-6 has powerful equipment on board that can track from hundreds of nautical miles away, but there is nothing anybody can do so long as she is in international waters," the official said. India's Territorial Waters extend to 12 nautical miles from the nearest low tide mark on shore. No foreign warship or submarine can enter this zone without permission from the Government of India. Even if permission is granted, foreign submarines have to traverse these waters on the surface with their countries' flags flying. It is the same for warships. There are no restrictions on other foreign vessels. As the Yuan Wang-6 is not registered as a naval vessel, she may attempt to enter India's Territorial Waters, if not prevented from entering the EEZ. This could land India on a sticky wicket.

"The only problem is if the Chinese vessel receives permission from any one of our maritime neighbours to enter their territorial waters. We share our maritime boundary with Bangladesh and Sri Lanka. Near these countries, we can't enforce our EEZ laws as the sea is contiguous. That is why we have International Maritime Boundary Lines to demarcate territory. Now, if Bangladesh allows the Yuan Wang-6 to dock at Chittagong or Sri Lanka grants permission to her at Hambantota Port, she will be lying extremely close to our coastline and tracking everything," another official said. Sri Lanka is neck deep in debt and has been forced to lease away the Hambantota Port to China. In August this year, the Yuan Wang-5, another spy ship from China, docked at Hambantota despite India's reservations. But then, Sri Lankan authorities could do little, except defer the arrival of the ship for some time, as much of Hambantota Port is in Chinese hands.

https://m.economictimes.com/news/defence/indian-navy-plans-to-stop-chinese-spy-ship-from-entering-indias-eez/amp_articleshow/95340832.cms

THE ECONOMIC TIMES

Sat, 05 Nov 2022

India's Ballistic Missile Test Likely to be Deferred Owing to Presence of Chinese Research Vessel in Indian Ocean Region; Indian Navy Closely Monitoring Situation

The user-trial of ballistic missile of the Agni series by the Strategic Forces Command next week is likely to be deferred owing to the presence of a Chinese research vessel in the Indian Ocean. The Indian Navy has been closely monitoring the movement of the vessel from the instance it entered the Indian Ocean Region. The over 22,000-tonne Yuan Wang-6, which is equipped with large antennae, advanced surveillance equipment and sensors capable of electronic snooping, monitoring satellite launches and tracking trajectories of long-range ballistic missiles, was sailing off the Bali coast in Indonesia early on Friday morning. "The Indian Navy has been closely monitoring the Chinese research vessel as soon as it entered the IOR. Indian Navy's assets which

are Mission deployed in the IOR and the aerial surveillance capabilities ensure that the Navy maintains a comprehensive maritime domain awareness in the region," ANI quoted defence sources as saying. Indian Navy has also been tracking its movement closely in the area and high altitude long-range unmanned aerial vehicles will keep a close watch and if it comes closer to Indian waters, an Indian surface warship may have a rendezvous with it. The Chinese also send these research vessels to keep track of their satellite launches but this time, its purpose may be to track Indian missile launches that are planned by the Defence Research and Development Organization in the next few months.

India has been dealing with such spy vessels that remain in international waters but can detect and track activities using their equipment. "India had earlier issued a NOTAM (notice to airmen) with an expanded no-fly zone over the Bay of Bengal for the test of a long-range ballistic missile on November 10-11. A new AD-1interceptor missile for Phase-II of the indigenous two-tier ballistic missile defence (BMD) system was also tested from the Abdul Kalam Island off the Odisha coast just two days ago," said a TOI report. In early-August, India had conveyed its serious concerns to Sri Lanka about the docking of Yuan Wang-5 at its southern port of Hambantota. This had initially led Colombo to defer the docking but then in a U-turn had allowed it from August 16 to 22. The US too had red-flagged the presence of the Chinese vessel at Hambantota.

<https://economictimes.indiatimes.com/news/defence/indias-ballistic-missile-test-likely-to-be-deferred-owing-to-presence-of-chinese-research-vessel-in-indian-ocean-region-indian-navy-closely-monitoring-situation/articleshow/95315485.cms>



Fri, 04 Nov 2022

Closely Monitoring Chinese Ship Since it Entered Indian Ocean: Ministry of Defence

Senior officials of the Ministry of Defence said that they had been tracking the Chinese ship, Yuan Wang 6, that had entered the waters of the Indian Ocean. The move comes just ahead of India's planned missile test later in the month off the coast of Odisha. Earlier, a similar incident took place when a Chinese ship had docked in the Sri Lankan port of Hambantota. Despite security concerns raised by India, the Chinese research vessel Yuan Wang 5 reached Sri Lanka's Hambantota Port on August 16, Daily Mirror had reported. The ship was welcomed by Sri Lankan port officials and Chinese officials from the ship company. The ship had been slated to arrive on August 11, but Sri Lanka's foreign ministry asked to postpone the docking until further consultations took place. The ministry said that the ship was given permission to dock in Hambantota until August 22. It said the two sides had agreed the ship would keep its identification systems on and would not carry out any research activities while in Sri Lanka waters.

<https://www.indiatvnews.com/news/india/chinese-spy-ship-yuan-wang-vi-found-in-indian-ocean-closely-monitoring-since-entry-ministry-of-defence-missile-test-launch-latest-updates-2022-11-04-821347>

Fri, 04 Nov 2022

India's Chief of Naval Staff on Official Japan Visit Between November 5-9

Admiral R Hari Kumar, Chief of the Naval Staff (CNS) is on an official visit to Japan between November 5-9 Nov 22. He will witness the International Fleet Review (IFR) conducted by the Japan Maritime Self-Defence Force (JMSDF), the CNS will attend the 18th WPNS between November 7-8 at Yokohama, being hosted by Japan, as the current Chair of WPNS. In addition to representing India and the Indian Navy during Defence Force (JMSDF) at Yokosuka on November 6 to commemorate the 70th Anniversary of its formation. During the visit, as one of the Observer Navies in the Western Pacific Naval Symposium (WPNS) the IFR and WPNS, Admiral R Hari Kumar will also be in attendance for the inauguration of the 2022 edition of Exercise MALABAR, being held at Yokosuka with the participation of Australia, Japan and the USA.

Initiated in 1992, this year marks the 30th anniversary year of Exercise MALABAR. Adm R Hari Kumar would also be interacting with his counterparts and other Heads of Delegations from close to 30 countries participating in the IFR, WPNS and MALABAR. Indian Naval Ships Shivalik and Karmota also arrived at Yokosuka, Japan on November 2 to participate in the IFR and Exercise MALABAR – 2022. The presence of these indigenously built ships will be an opportunity to showcase Indian Shipyards' ship-building capabilities during a large international gathering. The visit of the CNS to Japan signifies a high level of bilateral defence engagements with Japan, as well as India's active support and participation in multilateral engagements.

<https://www.financialexpress.com/defence/indias-chief-of-naval-staff-on-official-japan-visit-between-november-5-9/>

NewsOnAIR 

Sun, 06 Nov 2022

Navy Chief's Japan Visit to Focus on Boosting Bilateral Defence Ties

Chief of Naval Staff Admiral R Hari Kumar has embarked on an official visit to Japan from November 5 to 9. He is scheduled to attend the International Fleet Review (IFR) conducted by the Japan Maritime Self-Defence Force (JMSDF) in commemoration of the 70th anniversary of its formation at Yokosuka today. In the ongoing Japan visit, the CNS will also attend the 18th Western Pacific Naval Symposium (WPNS) as the Indian Navy is one of the observer navies in the symposium. The 18th WPNS is being hosted by Japan, as the current chair of WPNS, at Yokohama from November 7 to 8.

What's more?

Apart from attending the IFR and 18th WPNS, CNS Admiral R Hari Kumar will also be present at the inauguration of Exercise MALABAR 2022. Exercise MALABAR, which also marks its

30th anniversary this year, is being held at Yokosuka with the participation of the QUAD nations- India, USA, Japan and Australia. To participate in the IFR and Exercise MALABAR, Indian Naval Ships Shivalik and Kamorta also arrived at Yokosuka, Japan on November 2. The participation of these indigenously built ships in the multi-national events serves as an opportunity for India to display its ship-building capacity.

On the sidelines of the IFR, WPNS and Exercise MALABAR, the Navy chief is expected to meet and interact with his counterparts and other delegation from around 30 foreign countries. The visit of the CNS to Japan shows a high level of bilateral defence ties with Japan, as well as India's strong support and involvement in multilateral activities.

<https://newsonair.com/2022/11/06/navy-chiefs-japan-visit-to-focus-on-boosting-bilateral-defence-ties/>

THE TIMES OF INDIA

Sat, 05 Nov 2022

Why Everyone in Arms Industry Loves a Good War

In its ninth month the Ukraine war has entered a risky and unpredictable phase. Russia has not only resumed attacks on multiple Ukrainian cities – including the capital Kyiv – that are away from the actual battlefield, but also mused about tactical nuclear weapons. In response, Ukraine's Western backers are further stepping up military assistance. On October 28, the US authorised another \$275 million-worth of arms, munitions and equipment for Ukraine. This brings the total American military assistance to \$18. 5 billion since the beginning of the Biden administration. In the days ahead, Ukraine is expected to receive bigger quantities of more sophisticated weapons, such as air-defence systems and hi-tech drones.

Rising Defence Spend

With so much money for new orders, the global defence industry has hit a sweet spot. This is also because, as a March report by Janes points out, Russia's invasion of Ukraine has pushed up everyone's defence spending. Globally, the total spend will be a record \$2. 08 trillion this year, boosted by recent spending increases across Europe that has added \$30. 7 billion to its defence budgets this year, with 80% of this attributed to Germany.

Ukraine's Supply Lines

An analysis of the military aid provided to Ukraine shows the scale of the military spend and the quantities of weapons being moved. According to the Ukraine Support Tracker, an initiative of Germany's Kiel Institute For The World Economy, between January 4 and October 3 this year the US committed 27. 6 billion euros in military assistance to Ukraine, of which 15. 2 billion euros was towards specific weapons and equipment. This was followed by Poland's pledge of 1. 8 billion euros in specific military hardware, the UK's 1. 5 billion euros and Germany's 0. 7 billion euros. A list of the military items actually delivered to Ukraine provides clues to what kinds of weapons need to be replaced in the inventories of the donor nations, and which arms manufacturers are benefitting from fresh orders. As per the tracker, some of the significant military equipment delivered by the US includes Stinger anti-aircraft systems (made by Raytheon), Javelin anti-tank weapon systems (Raytheon and LockheedMartin), Switchblade

tactical unmanned aerial system (AeroVironment), M777 howitzer (BAE Systems), HIMARS multiple rocket launchers (Lockheed Martin), and a variety of ammunitions and armoured tactical vehicles.

Meanwhile, the significant UK deliveries include Starstreak anti-aircraft systems (Thales), NLAW anti-tank weapon (Saab Bofors Dynamics-Thales), and armoured vehicles like the Mastiff 6x6 (Force Protection Inc). Germany has provided Gepard rapid-fire armoured vehicles and Panzerfaust 3 antiarmour weapons (Dynamit Nobel AG), while France has supplied CAESAR howitzers (Nexter Systems).

Defence Cos Raking

It In Since many of these platforms need to be replenished in the inventories of donor nations, fresh orders are being placed and production chains are being ramped up. As a result, arms manufacturing companies have seen their stocks trend upwards since the start of the war. In fact, defence stocks have outperformed global markets this year. Since the beginning of the war in February, shares of BAE Systems had risen by 37% in September. Over the same period, Lockheed Martin saw a growth of 8%, General Dynamics (makers of armoured vehicles) 5. 6%, Northrop Grumman (makers of warheads and hypersonic missiles) 26%, and AeroVironment 80%.

New Players Cash

In Add to this windfalls for previously little-known defence firms like Turkey's Baykar Makina, makers of the Bayraktar TB2 drones that achieved an almost legendary status among Ukrainian forces in the earlier part of the war. Baykar is owned by Selcuk Bayraktar – son-in-law of Turkish President RecepTayyip Erdogan – and his brother Haluk. Kyiv had been buying Baykar drones even before the start of the war and there are talks of the Turkish company even setting up a factory in Ukraine, although some complications appear to have cropped up in that project. In August, the companyhad said it was working on increasing its production capacity and that it had a threeyear order backlog.

On the other side, Russia has turned to Iranian-made drones like the surveillance and attack Mohajer 6 – which is analogous to the Bayraktar TB2 – and the Shahed-136 kamikaze drones (manufactured by Iranian Aircraft Industrial Company) that have been used against critical Ukrainian infrastructure in recent weeks. Interestingly, according to a new report from the Institute for Science and International Security in the US, the Iranian drones have been found to be manufactured with Chinese components. In fact, the Shahed-136 drone uses an engine made by Beijing MicroPilot Flight Control System, which is a copy of a German engine. Clearly the war in Ukraine has not only been good for defence firms' balance sheets, it is also spurring the testing of new systems, weapons collaborations and tactics. The conflict is heralding a new era of warfare with greater integration between troops and unmanned platforms. Arms merchants are already prepared for the next big.

<https://timesofindia.indiatimes.com/times-special/why-everyone-in-arms-industry-loves-a-good-war/articleshow/95310801.cms>

Fri, 04 Nov 2022

Global Data Study Identifies VAMPIRE Anti-Drone System an Cost Effective Option for Ukraine

Data and analytics company, Global Data has identified the VAMPIRE anti-drone system as a cost-effective solution to Ukraine compared to the MiG-29s, S-300 and NASAMS ground defence systems which the country is currently using in tackling Russian attack. The use of drones and loitering munitions by Russia in recent months has come at a relatively low financial cost but has increased the costs for Ukraine to launch effective anti-air systems, says GlobalData. Whilst Ukraine has had a high degree of success in combatting these attacks by Russia, the VAMPIRE anti-drone system is seen as a cheaper option compared to utilising aircraft or ground defence systems. This can be easily mounted on the back of a civilian truck, and will be delivered to Ukraine in mid-2023. The system is being produced by L3Harris at a cost of around \$27,000 per unit. William Davies, Associate Analyst at GlobalData, explained, “The estimated cost of the Shahed loitering munition used by Russia is between \$10,000-50,000 , and as such is relatively cheap to deploy.

Along with the use of COTS drones in the battlefield, Russia, which, at the start of the war was using ineffective and expensive domestic drones, is becoming a serious threat to Ukrainian civilians and its military infrastructure.” The advantage of the VAMPIRE system is it is easy to mobilise as needed, apart from the low cost and meeting Ukraine’s anti-drone needs. Davies added that, “The deployment of the VAMPIRE system will give Ukraine the freedom to mobilise its anti-aircraft systems to defend key infrastructure, but the range limit of the system is around 2 miles, and this combined with the fact that it won’t appear in Ukraine until the middle of 2023 means it is not yet a miracle solution to Ukraine’s drone problems.” The utilisation of converted commercial drones alongside traditional anti-air systems could provide Ukraine with an effective multilayer air defence network. As unmanned systems continue to proliferate warfare, C-UAS will become increasingly vital.

<https://www.financialexpress.com/defence/global-data-study-identifies-vampire-anti-drone-system-an-cost-effective-option-for-ukraine/>



Mon, 07 Nov 2022

Japan PM Vows to Strengthen Military at int'l Naval Review

Japan's Prime Minister Fumio Kishida at an international fleet review Sunday said his country urgently needs to strengthen its military capabilities amid a worsening security environment in

the East and South China seas and threats from North Korea's nuclear and missile advancement and Russia's war on Ukraine. Eighteen warships participated in the review from 12 countries, including the United States, Australia, Canada, India, New Zealand, Singapore and South Korea, while the U.S. And France also sent warplanes. South Korea joined for the first time in seven years, in the latest sign of improvement in badly strained ties between Tokyo and Seoul over Japan's wartime atrocities. "The security environment in the East and South China seas, especially around Japan, is increasingly becoming more severe," Kishida said, noting North Korea's increased missile firings, including one that flew over Japan last month, and growing concern about the Russian invasion's impact in Asia. Avoiding disputes and seeking dialogue is important, Kishida said, but it is also necessary to be prepared for provocations and threats to peace and stability. He repeated his pledge to significantly reinforce Japan's military capability within five years.

Kishida said Japan urgently needs to build more warships, strengthen anti-missile capability and improve working conditions for troops. "We have no time to waste," Kishida said after his review aboard JS Izumo, where naval officers from the participating countries gathered to review a demonstration of the frigates, submarines, supply ships and warplanes in Sagami Bay southwest of Tokyo. The 248-meter- (813-foot) long Izumo has been retrofitted so that it can carry F-35Bs, stealth fighters capable of short take-offs and vertical landings, as Japan increasingly works side-by-side with the U.S. Military. Kishida said Japan will further strengthen the deterrence and response capability of the Japan-U.S. Alliance.

Later Sunday, Kishida was to visit the USS Ronald Reagan, the U.S. Navy's only forward-deployed aircraft carrier, off the U.S. Naval base of Yokosuka, with U.S. Ambassador to Japan Rahm Emanuel. Japan has steadily stepped up its international defense role and military spending over the past decade, and plans to double its military budget in the next five to 10 years to about 2% of its GDP, citing a NATO standard, amid threats from North Korea and China's growing assertiveness. Kishida's government is currently working on a revision to its national security strategy and mid- to long-term defense policies, and is considering allowing the use of pre-emptive strike capability in a major shift to Japan's self-defense-only postwar principle. Critics say allowing pre-emptive strike capability could violate Japan's pacifist Constitution. Apparently addressing concerns from Asian neighbors, Kishida said Japan will stick to its postwar pledge as a "pacifist nation" and continue to explain its security policy to gain understanding, while asking other countries to do the same. Many Asian countries, including South Korea, were victims of Japanese aggression in the first half of the 1900s, and an attempt by Japan to increase its military role and spending could be a sensitive issue. Sunday's international fleet review marks the 70th anniversary of the founding of Japan's postwar navy, called the Maritime Self-Defense Force, seven years after Japan was demilitarized after its World War II defeat. The naval ships and warplanes were to participate in joint exercises later on Sunday and Monday. It was the first time Japan hosted an international fleet review in 20 years. China did not take part in the review but is to participate in the two-day Western Pacific Naval Symposium to be held in Yokohama from Monday. Naval officers from about 30 countries are expected to attend the gathering to discuss maritime security.

<https://www.dailypioneer.com/2022/world/japan-pm-vows-to-strengthen-military-at-int-l-naval-review.html>

South Korea Scrambles Stealth Jets after Detecting North Korean Warplanes

South Korea's military scrambled stealth jets on Friday after detecting the mobilisation of 180 North Korean warplanes, Seoul said as it conducted large-scale joint air drills with the United States which have infuriated Pyongyang. North Korea has launched a record-breaking blitz of missile launches this week, including a failed intercontinental ballistic missile test on Thursday. Seoul and Washington extended their largest-ever joint air drills through Saturday in response to the North's flurry of projectiles. "Our military detected around 180 North Korean warplanes" mobilised in Pyongyang's airspace, Seoul's Joint Chiefs of Staff said, adding that Seoul "scrambled 80 fighter jets including F-35As" while jets involved in the joint drills were also "maintaining readiness".

Shortly after South Korea announced the decision to extend the joint drills on Thursday, Pyongyang launched three more short-range ballistic missiles, calling the move "a very dangerous and wrong choice". Hours later, the North fired 80 artillery rounds that landed in a maritime "buffer zone", Seoul's military said. The barrage was a "clear violation" of the 2018 agreement that established the buffer zone in a bid to reduce tensions between the two sides, Seoul's Joint Chiefs of Staff said. The artillery fire came after Pyongyang fired about 30 missiles Wednesday and Thursday, including an intercontinental ballistic missile and one that landed near South Korea's territorial waters for the first time since the end of the Korean War in 1953. US Defence Secretary Lloyd Austin described Pyongyang's ICBM launch as "illegal and destabilising", and Seoul and Washington vowed to pursue new measures to demonstrate their "determination and capabilities" against the North's growing threats. Experts and officials have said Pyongyang is ramping up its tests in protest over the US-South Korean drills. Washington and Seoul have repeatedly warned that Pyongyang's recent launches could be a precursor to a nuclear test, which would be its seventh. Pyongyang has called the joint air drills, dubbed Vigilant Storm, "an aggressive and provocative military drill targeting" North Korea, and threatened that Washington and Seoul would "pay the most horrible price in history" if it continued.

<https://www.hindustantimes.com/world-news/south-korea-scrambles-stealth-jets-after-detecting-north-korean-warplanes-101667545681599.html>

North Korea Fires More Missiles as U.S. Flies Bombers Over South

North Korea added to its recent barrage of weapons demonstrations by launching four ballistic missiles into the sea on November 5, as the United States sent two supersonic bombers streaking over South Korea in a duelling display of military might that underscored rising tensions in the region. South Korea's Joint Chiefs of Staff said that the four short-range missiles fired from a western coastal area around noon flew about 130 kilometres (80 miles) toward the country's western sea. The North has test-fired more than 30 missiles this week, including an intercontinental ballistic missile on Thursday that triggered evacuation alerts in northern Japan, and flew large numbers of warplanes inside its territory in an angry reaction to a massive combined aerial exercise between the United States and South Korea.

It marked the first time since December 2017 that the bombers were deployed to the Korean Peninsula. The exercise involved around 240 warplanes, including advanced F-35 fighter jets from both countries. North Korea's Foreign Ministry late on Nov. 4 described the country's military actions this week as an appropriate response to the exercise, which it called a display of U.S. "military confrontation hysteria". It said North Korea will respond with the "toughest counteraction" to any attempts by "hostile forces" to infringe on its sovereignty or security interests. South Korea's Joint Chiefs of Staff said the participation of the B-1Bs in the joint drills demonstrated the allies' readiness to "sternly respond" to North Korean provocations and the U.S. commitment to defend its ally with the full range of its military capabilities, including nuclear.

B-1B flyovers had been a familiar show of force during past periods of tensions with North Korea. The planes last appeared in the region in 2017, during another provocative run in North Korean weapons demonstrations. But the flyovers had been halted in recent years as the United States and South Korea stopped their large-scale exercises to support the former Trump administration's diplomatic efforts with North Korea and because of the COVID-19 pandemic. The allies resumed their large-scale training this year after North Korea dialled up its weapons testing to a record pace, exploiting a divide in the U.N. Security Council over Russia's war on Ukraine as a window to accelerate arms development. North Korea hates such displays of American military might at close range. The North has continued to describe the B-1B as a "nuclear strategic bomber" although the plane was switched to conventional weaponry in the mid-1990s.

Vigilant Storm had been initially scheduled to end on Nov. 4, but the allies decided to extend the training to Nov. 5 in response to a series of North Korean ballistic launches on Nov. 3, including an ICBM that triggered evacuation alerts and halted trains in northern Japan. Nov. 3 launches came after the North fired more than 20 missiles on Nov. 2, the most in a single day. Those launches came after North Korean senior military official Pak Jong Chon issued a veiled threat of a nuclear conflict with the United States and South Korea over their joint drills, which the North says are rehearsals for a potential invasion. South Korea also on Friday scrambled about

80 military aircraft after tracking about 180 flights by North Korean warplanes inside North Korean territory. The South's Joint Chiefs of Staff said the North Korean warplanes were detected in various areas inland and along the country's eastern and western coasts, but did not come particularly close to the Koreas' border.

The South Korean military spotted about 180 flight trails from 1 p.m. to 5 p.m., but it wasn't immediately clear how many North Korean planes were involved and whether some may have flown more than once. In Nov. 4 statement attributed to an unidentified spokesperson, North Korea's Foreign Ministry said the United States and South Korea had created a seriously "unstable atmosphere" in the region with their military exercises. It accused the United States of mobilising its allies in a campaign using sanctions and military threats to pressure North Korea to unilaterally disarm. "The sustained provocation is bound to be followed by sustained counteraction," the statement said. North Korea has launched dozens of ballistic missiles this year, including multiple ICBMs and an intermediate-range missile flown over Japan. South Korean officials say there are indications North Korea in coming weeks could detonate its first nuclear test device since 2017. Experts say North Korea is attempting to force the United States to accept it as a nuclear power and seeks to negotiate economic and security concessions from a position of strength.

<https://www.thehindu.com/news/international/north-korea-fires-missiles-into-sea-amid-us-south-korea-drills/article66099565.ece>

Science & Technology News



सोमवार, 07 नवंबर 2022

अब शुक्र ग्रह और सूर्य के अध्ययन की तैयारी में भारत, चांद के अनसुलझे रहस्यों का भी लगेगा पता

भारत जल्द ही शुक्र ग्रह और सूर्य के अध्ययन के लिए खुद की तकनीक विकसित करने जा रहा है। गुजरात के अहमदाबाद स्थित फिजिकल रिसर्च लेबोरेटरी के निदेशक डा. अनिल भारद्वाज ने कहा कि आकाश में चल रही हलचल पर भारत नजर बनाए हुए है। वर्ष 1975 में पहला उपग्रह आर्य भट्ट छोड़ने के बाद भारत ने अंतरिक्ष विज्ञान को तेजी से आगे बढ़ाया और स्वयं के प्रक्षेपण केंद्र बनाए। उन्होंने कहा कि हमारे चंद्रयान और मंगल मिशन सफल रहे हैं। भविष्य में हम शुक्र ग्रह और सूर्य के अध्ययन के लिए अपनी तकनीक विकसित करने जा रहे हैं। जापान की एयरो स्पेस एक्सप्लोरेशन एजेंसी (जाक्सा) के

सहयोग से हम चंद्र लैंटर और रोवर को चांद की डार्क साइट में स्थापित करने के मिशन पर तेजी से काम कर रहे हैं। इस मिशन को लेकर जाक्सा के साथ वार्ता चल रही है।

जापान के साथ काम कर रहा इसरो

उत्तरांचल यूनिवर्सिटी में आयोजित राष्ट्रीय संगोष्ठी 'आकाश तत्व' में अंतिम दिन पहले व दूसरे सत्र में विशेषज्ञों ने आकाश को लेकर विभिन्न पक्षों पर अपने विचार रखे। डा. अनिल भारद्वाज ने कहा कि जापान के सहयोग से इसरो चांद के अनसुलझे रहस्यों का पता लगाने की दिशा में काम कर रहा है। आदित्य एल-वन मिशन पर भी तेजी से काम किया जा रहा है। जार्ज मेसन विवि अमेरिका के प्रो. जे. शुक्ला ने जलवायु परिवर्तन और मौसम का अनुमान लगाने की वर्तमान स्थिति पर विस्तार से अवगत कराया।

सूर्य के अंदर चल रही गतिविधियों के दूरगामी प्रभाव

दिन के प्रथम सत्र में डीआरडीओ के विज्ञानी अंकुश कोहली ने वातावरण में उपांतरण और भू-स्थित अनेक तकनीक का भारत पर दूरगामी प्रभाव से सतर्क रहने की सलाह दी। आइआइटी मुंबई की प्रो. गीता विचारे ने सूर्य के अंदर चल रही गतिविधियों के कारण बड़ी मात्रा में मिलने वाले विकरणों और प्लाज्मा के रूप में मिलने वाले आवेशित कणों का सोलर विंड के कारण पृथ्वी के चुंबकीय क्षेत्र पर पड़ने वाले प्रभाव पर विचार रखे। उन्होंने कहा कि इसमें इतनी ऊर्जा होती है कि वह हमारे संचार तंत्र, जीपीएस, तेल संयंत्रों, इलेक्ट्रिक ग्रिड जैसे तंत्र को नष्ट कर सकते हैं।

सूर्य पर विश्वभर में हो रहे शोध

नासा के विज्ञानी डा. एन गोपाल स्वामी ने सूर्य पर विश्वभर में हो रहे शोध और सूर्य पर हो रही घटनाओं के पृथ्वी पर प्रभाव का विस्तृत वर्णन किया। आइआइटी कानपुर के प्रो. मुकेश शर्मा ने पूरे देश, विशेषकर राजधानी दिल्ली में वायु प्रदूषण संबंधी शोध के आधार पर बताया कि वर्तमान में वायु की गुणवत्ता अत्यंत खराब व चिंताजनक है। इसे सुधारने के लिए हमें कार्बन उत्सर्जन को सीमित करने की विभिन्न विधियों पर काम करना होगा। सड़कों की धूल, वाहनों, घरों, फैक्ट्रियों से होने वाले प्रदूषण को आकाश में जाने से बचाना होगा। आइआइटी दिल्ली के प्रो. मुकेश खरे ने स्वच्छ हवा और साफ आकाश की अवधारणा को सब तक पहुंचाने व इस पर चल रहे कार्यों का विवरण दिया। दिल्ली विवि के प्रो. एसके ढाका ने दिल्ली में ऐरोसोल की अधिकता व पर्यावरणीय डाटा को प्रस्तुत किया और इसमें सुधार हेतु सुझाव दिए।

<https://www.jagran.com/news/national-isro-new-mission-for-study-of-venus-and-sun-india-japan-working-on-mysteries-of-moon-23187220.html>

ISRO Plans To Explore Permanent Dark Side Of Moon In Collaboration With Japan

ISRO is planning to collaborate with the Japanese Aerospace Exploration Agency (JAXA) for sending a lunar rover to explore the permanent shadow region of the moon. After missions to the moon and Mars, the Indian Space Research Organisation (ISRO) has now set its eyes on Venus and also plans to explore the dark side of the moon, while partnering with Japan. Making a presentation on ISRO's future missions at the Akash Tattva conference, Anil Bhardwaj, Director of the Ahmedabad-based Physical Research Laboratory, told PTI that the space agency also planned to send a probe to Mars. Bhardwaj added that it was in talks with the Japanese Aerospace Exploration Agency (JAXA) for sending a lunar rover to explore the permanent shadow region of the moon.

Lunar Rover to Explore Dark Side of the Moon

As per the initial plans, a lunar lander and rover built by ISRO will be put into orbit by a Japanese rocket with a planned landing near the south pole of the moon. "The rover will then travel to the permanent shadow region of the moon which never sees sunlight," Bhardwaj said. He said the exploration of the region was interesting as anything that has remained in the PSR zone was akin to staying in deep freeze for times immemorial.

Unique Mission

Bhardwaj said the Aditya L-1 would be a unique mission in which a 400-kg class satellite carrying the payload would be placed in an orbit around the Sun in such a way that it can continuously view the star from a point called the Lagrange Point L-1. The orbit would be located 1.5 million kilometres away from the Earth and it would try to understand the coronal heating, solar wind acceleration and the initiation of coronal mass ejection, flares and near-earth space weather. Bhardwaj said the Aditya L-1 and the Chandrayaan-3 missions would be taken up on priority as early as next year and were likely to be followed by the mission to Venus and the mission to the moon with JAXA.

<https://www.india.com/science/isro-plans-to-explore-permanent-dark-side-of-moon-in-collaboration-with-japan-5727587/>

ThePrint

NASA's Moon Rocket Artemis I Ready for Another Launch Attempt

Following several repairs amid reports of fuel leaks, NASA's Artemis I mega moon rocket is back on the launchpad on Friday (local time) ahead of the third launch attempt, said officials.

The space agency gears up for another attempt to get the Artemis I mission off the ground. The uncrewed test mission is slated for November 14, with a 69-minute launch window that opens at 12:07 a.m. ET. The launch will stream live on NASA's website, reported CNN. Fuel leaks have kept the rocket grounded since August. The rocket had been stowed away for weeks after issues with fuel leaks that thwarted the first two launch attempts and then a hurricane Ian rolled through Florida, forcing the rocket to vacate the launchpad and head for safety.

The Space Launch System rocket began the hours-long process of trekking 4 miles (6.4 kilometers) from its indoor shelter to Pad 39B at NASA's Kennedy Space Center in Florida late Thursday evening. It arrived at its destination nearly 9 hours later, reported CNN. The Artemis team again is monitoring a storm that could be heading toward Florida, but officials felt confident to move ahead with the rollout, according to Jim Free, associate administrator for NASA's Exploration Systems Development Mission Directorate. The unnamed storm could develop near Puerto Rico over the weekend and will slowly move northwest early next week, said meteorologist Mark Burger, the launch weather officer with the US Air Force at Cape Canaveral.

It is NASA's most significant step to get astronauts back on the moon by 2025. The space agency is nearing the 50th anniversary of its last human moon landing: Apollo 17 in December 1972. The Artemis I mission is expected to pave the way for other missions to the moon. After takeoff, the Orion capsule, which is designed to carry astronauts and sits atop the rocket during liftoff, will separate as it reaches space. It'll fly empty for this mission, apart from a couple of mannequins. The Orion capsule will spend a few days manoeuvring out to the moon before entering its orbit and beginning the trek back home days later, reported CNN. Overall, the mission is expected to last for 25 days, with the Orion capsule's splashdown in the Pacific Ocean off San Diego set for December 9.

The purpose of the journey is to gather data and test out the hardware, navigation and other systems to ensure both the SLS rocket and Orion capsule are ready to host astronauts. The Artemis programme aims to land the first woman and first person of colour on the lunar surface this decade. The Artemis II mission, slated for 2024, is expected to follow a similar flight path around the moon and will have a crew on board. And in 2025, Artemis III is expected to land astronauts on the lunar surface for the first time since NASA's Apollo programme.

<https://theprint.in/world/nasas-moon-rocket-artemis-i-ready-for-another-launch-attempt/1199294/>

