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Press Information Bureau
Government of India
Prime Minister's Office

Fri, 19 Nov 2021 7:16PM

PM attends ‘Rashtra Raksha Samparpan Parv’ in Jhansi, Uttar Pradesh

Paid tributes to Rani Laxmibai and hero heroines of 1857 war of Independence; remembered Major Dhyanchand

The Prime Minister registers as the first member of the NCC Alumni Association

“On the one hand, the strength of our forces is increasing, at the same time, the ground is also being prepared for the capable youth to protect the country in future”

“The government has started admission of daughters in Sainik Schools. In 33 Sainik Schools, the admission of female students has already started from this session”

“For a long time, India has been among the largest arms buyer countries in the world. But today the mantra of the country is - Make in India, Make for the world”

Prime Minister Shri Narendra Modi attended ‘Rashtra Raksha Samparpan Parv’ in Jhansi, Uttar Pradesh. Prime Minister Shri Narendra Modi dedicated several new initiatives of the Ministry of Defence to the Nation in a grand ceremony celebrating ‘Rashtra Raksha Samarpan Parv’ organised in the precincts of Jhansi Fort. These projects include Launch of NCC Alumni Association, the Prime Minister was registered as the first member of the association; Launch of National Programme of Simulation Training for NCC Cadets; Kiosk to pay tribute to the fallen heroes at National War Memorial; Mobile app of National War Memorial; DRDO Designed and Developed Advanced Electronic Warfare Suite ‘Shakti’ for Indian Naval Ships; Light Combat Helicopter and drones. He also laid the foundation stone of the Rs 400 crore project of Bharat Dynamics Ltd at Jhansi Node of the UP Defence Industrial Corridor.



The Prime Minister also laid the foundation stone of the 600 MW Ultramega Solar Power Park at Garautha in Jhansi. It is being constructed at a cost of over Rs 3000 crore, and will help provide the dual benefits of cheaper electricity and grid stability. The Prime Minister also inaugurated Atal Ekta Park in Jhansi. Named after Former Prime Minister Shri Atal Bihari Vajpayee, the park has been built at a cost of over Rs 11 crore, and is spread across an area of about 40,000 square metre. It will also house a library, as well as a statue of Shri Atal Bihari Vajpayee. The statue has been built by the renowned sculptor Shri Ram Sutar, the man behind the Statue of Unity.

Addressing the gathering, the Prime Minister noted the birth anniversary of Rani Laxmibai, the pinnacle of valor and might and said today this land of Jhansi is witnessing the grand Amrit Mahotsav of freedom! And today a new strong and powerful India is taking shape on this land. Prime Minister said he feels pride in representing the birthplace of Rani Laxmibai i.e. Kashi. The Prime Minister also extended warm wishes for the Prakash Purab of Guru Nanak Dev Ji, Kartik Purnima and Dev-Deepawali. The Prime Minister paid tribute to many heroes and heroines for their contribution to the history of valor and sacrifice. “This land has also been a witness to the bravery and military prowess of Veerangana Jhalkari Bai, who was an inseparable ally of Rani Laxmibai. I also bow at the feet of that immortal heroine of the freedom struggle of 1857. I bow to the Chandelas-Bundelas, who wrote immortal tales of Indian valor and culture from this land, who made India proud! I bow to the pride of Bundelkhand, those brave Alha-Udals, who are still a symbol of sacrifice and sacrifice for the protection of mother-land” the Prime Minister narrated.

The Prime Minister also remembered Major Dhyan Chand, son of Jhansi and talked about the renaming of the highest award in sports excellence after the Hockey legend.

The Prime Minister remarked that today, on the one hand, the strength of our forces is increasing, but at the same time, the ground is also being prepared for the capable youth to protect the country in future. The 100 Sainik Schools, which are starting, will work in the coming times to give the future of the country in powerful hands. He said that the government has started admission of daughters in Sainik Schools. In 33 Sainik Schools, the admission of female students has already started from this session. Daughters like Rani Laxmibai will also emerge from Sainik Schools, who will take the responsibility of defense, security and development of the country on their shoulders.

The Prime Minister, who was registered as the first member of NCC Alumni Association, called upon the fellow alumni to come forward in service to the nation and contribute in whatever manner possible.

With the historical Jhansi fort behind him, the Prime Minister said that India never lost any battle due to lack of valor. If Rani Laxmibai had resources and modern weapons at par with the British, then the history of the country's independence might have been different, he said. The Prime Minister said for a long time, India has been among the largest arms buyer countries in the world. But today the mantra of the country is - Make in India, Make for the world. Today India is working to make its forces self-reliant. Jhansi will be a major player in this enterprise, he added.

The Prime minister said events like ‘Rashtra Raksha Samparpan Parv’ will go a long way in creating an environment of Aatmnirbharta in the defence sector. He said we need to celebrate our national heroes and heroines in the similarly grand manner.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1773303>



पत्र सूचना कार्यालय
भारत सरकार

प्रधानमंत्री कार्यालय

Fri, 19 Nov 2021 7:16PM

प्रधानमंत्री ने उत्तर प्रदेश के झांसी में 'राष्ट्र रक्षा समर्पण पर्व' में भाग लिया

रानी लक्ष्मीबाई के साथ-साथ 1857 के स्वतंत्रता संग्राम के वीरों एवं वीरांगनाओं को श्रद्धांजलि अर्पित की; मेजर ध्यानचंद को स्मरण किया

प्रधानमंत्री ने 'एनसीसी पूर्व छात्र संघ' के प्रथम सदस्य के रूप में पंजीकरण कराया

'आज एक ओर हमारी सेनाओं की ताकत बढ़ रही है, तो साथ ही भविष्य में देश की रक्षा के लिए सक्षम युवाओं के लिए जमीन भी तैयार हो रही है'

'हमारी सरकार ने सैनिक स्कूलों में बेटियों का दाखिला शुरू कर दिया है। 33 सैनिक स्कूलों में इस सत्र से छात्राओं का दाखिला शुरू भी हो गया है'

'लंबे समय से भारत को दुनिया के सबसे बड़े हथियार खरीदार देशों में गिना जाता रहा है। लेकिन आज देश का मंत्र है - मेक इन इंडिया, मेक फॉर द वर्ल्ड'

प्रधानमंत्री श्री नरेन्द्र मोदी ने उत्तर प्रदेश के झांसी में 'राष्ट्र रक्षा समर्पण पर्व' में भाग लिया। प्रधानमंत्री श्री नरेन्द्र मोदी ने झांसी किले के प्रांगण में आयोजित 'राष्ट्र रक्षा समर्पण पर्व' के एक भव्य समारोह में रक्षा मंत्रालय की कई नई पहलों को राष्ट्र को समर्पित किया। इन परियोजनाओं में एनसीसी पूर्व छात्र संघ का शुभारंभ भी शामिल है, प्रधानमंत्री को इस संघ के प्रथम सदस्य के रूप में पंजीकृत किया गया। एनसीसी कैडेटों के लिए राष्ट्रीय सिमुलेशन प्रशिक्षण कार्यक्रम का शुभारंभ; राष्ट्रीय युद्ध स्मारक पर शहीदों को श्रद्धांजलि देने के लिए कियोस्क; राष्ट्रीय युद्ध स्मारक का मोबाइल ऐप; भारतीय नौसेना के जहाजों के लिए डीआरडीओ द्वारा डिजाइन एवं विकसित उन्नत इलेक्ट्रॉनिक वारफेयर सूट 'शक्ति'; हल्का लड़ाकू हेलीकाप्टर और ड्रोन भी इन परियोजनाओं में शामिल है।



प्रधानमंत्री ने झांसी के गरौठा में 600 मेगावाट के अल्ट्रा मेगा सौर ऊर्जा पार्क की आधारशिला भी रखी। इस ऊर्जा पार्क का निर्माण 3000 करोड़ रुपये से अधिक की लागत से किया जा रहा है और यह सस्ती बिजली एवं ग्रिड स्थिरता के दोहरे लाभ प्रदान करने में मदद करेगा। प्रधानमंत्री ने झांसी में अटल एकता पार्क का भी उद्घाटन किया। पूर्व प्रधानमंत्री श्री अटल बिहारी वाजपेयी के नाम पर रखा गया यह एकता पार्क 11 करोड़ रुपये से अधिक की लागत से बनाया गया है और लगभग 40,000 वर्गमीटर में फैला हुआ है। इस पार्क में एक पुस्तकालय के साथ-साथ श्री अटल बिहारी वाजपेयी की एक प्रतिमा भी होगी। इस

प्रतिमा का निर्माण प्रसिद्ध मूर्तिकार श्री राम सुतार ने किया है, जिन्होंने स्टैच्यू ऑफ यूनिटी का निर्माण किया था।

इस अवसर पर एक जनसभा को संबोधित करते हुए प्रधानमंत्री ने वीरता और पराक्रम की प्रतीक रानी लक्ष्मीबाई की जयंती का उल्लेख किया और कहा कि आज झांसी की यह धरती आजादी के भव्य अमृत महोत्सव की साक्षी बन रही है! और आज इस धरती पर एक नया सशक्त और सामर्थ्यशाली भारत आकार ले रहा है। प्रधानमंत्री ने कहा कि उन्हें रानी लक्ष्मीबाई की जन्मस्थली यानी काशी का प्रतिनिधित्व करने पर गर्व महसूस होता है। प्रधानमंत्री ने गुरु नानक देव जी के प्रकाश पर्व, कार्तिक पूर्णिमा और देव-दीपावली की भी हार्दिक शुभकामनाएं दीं। प्रधानमंत्री ने वीरता और बलिदान के इतिहास में योगदान के लिए कई नायकों और नायिकाओं को श्रद्धांजलि दी। प्रधानमंत्री ने कहा, “यह धरती रानी लक्ष्मीबाई की अभिन्न सहयोगी रहीं वीरांगना झलकारी बाई की वीरता और सैन्य कौशल की भी साक्षी रही है। मैं 1857 के स्वतंत्रता संग्राम की उस अमर वीरांगना के चरणों में भी नमन करता हूँ। मैं नमन करता हूँ इस धरती से भारतीय शौर्य और संस्कृति की अमर गाथाएं लिखने वाले चंदेलों-बुंदेलों को, जिन्होंने भारत की वीरता का लोहा मनवाया! मैं नमन करता हूँ बुंदेलखण्ड के गौरव, उन वीर आल्हा-ऊदल को, जो आज भी मातृ-भूमि की रक्षा के लिए त्याग और बलिदान के प्रतीक हैं।”

प्रधानमंत्री ने झांसी के सपूत मेजर ध्यानचंद को भी याद किया और खेलों में उत्कृष्टता के लिए दिए जाने वाले सर्वोच्च पुरस्कार का नाम बदलकर हॉकी के इस दिग्गज के नाम पर रखने के बारे में बात की।

प्रधानमंत्री ने कहा, “आज एक ओर हमारी सेनाओं की ताकत बढ़ रही है, तो साथ ही भविष्य में देश की रक्षा के लिए सक्षम युवाओं के लिए जमीन भी तैयार हो रही है। ये 100 सैनिक स्कूल जिनकी शुरुआत होगी, ये आने वाले समय में देश का भविष्य ताकतवर हाथों में देने का काम करेंगे।” उन्होंने कहा, “हमारी सरकार ने सैनिक स्कूलों में बेटियों के एडमिशन की शुरुआत की है। 33 सैनिक स्कूलों में इस सत्र से गर्ल्स स्टूडेंट्स के एडमिशन शुरू भी हो गए हैं। सैनिक स्कूलों से रानी लक्ष्मीबाई जैसी बेटियाँ भी निकलेंगी जो देश की रक्षा-सुरक्षा, विकास की जिम्मेदारी अपने कंधों पर उठाएंगी”

एनसीसी पूर्व छात्र संघ के पहले सदस्य के रूप में पंजीकृत प्रधानमंत्री ने साथी पूर्व छात्रों से राष्ट्र की सेवा के लिए आगे आने और हर संभव तरीके से योगदान देने का आह्वान किया।

प्रधानमंत्री ने कहा, “मेरे पीछे ये ऐतिहासिक झांसी का किला, इस बात का जीता जागता गवाह है कि भारत कभी कोई लड़ाई शौर्य और वीरता की कमी से नहीं हारा! रानी लक्ष्मीबाई के पास अगर अंग्रेजों के बराबर संसाधन और आधुनिक हथियार होते, तो देश की आजादी का इतिहास शायद कुछ और होता।” उन्होंने कहा, “लंबे समय से भारत को दुनिया के सबसे बड़े हथियार खरीदार देशों में गिना जाता रहा है। लेकिन आज देश का मंत्र है-मेक इन इंडिया, मेक फॉर द वर्ल्ड। आज भारत अपनी सेनाओं को आत्मनिर्भर बनाने के लिए काम कर रहा है।” उन्होंने कहा कि झांसी इस उद्यम का प्रमुख क्षेत्र बनकर उभरेगा।

प्रधानमंत्री ने कहा कि 'राष्ट्र रक्षा समर्पण पर्व' जैसे आयोजन रक्षा क्षेत्र में आत्मनिर्भरता का वातावरण तैयार करने में बेहद मददगार साबित होंगे। उन्होंने कहा कि हमें अपने राष्ट्रीय नायकों और नायिकाओं का इसी तरह भव्य तरीके से गुणगान करने की जरूरत है।

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Press Information Bureau
Government of India

Ministry of Defence

Sun, 21 Nov 2021 1:28PM

INS Visakhapatnam commissioned into Indian Navy in the presence of Raksha Mantri Shri Rajnath Singh at Naval Dockyard, Mumbai

Indigenously developed missile destroyer packed with state-of-the-art weapons & sensors with modern surveillance radars

Raksha Mantri describes it as a symbol of India's growing maritime prowess

Key Highlights of RM's speech:

- *INS Visakhapatnam will strengthen maritime security & protect national interests*
- *Giant leap towards achieving 'Make in India, Make for the World'*
- *Public-private partnership will soon make India a global shipbuilding hub*
- *Indian Navy's primary objective is to keep Indo-Pacific open, safe & secure*
- *We envision a rule-based Indo-Pacific in which interests of all participating countries are protected*
- *Rule-based freedom of navigation & security of sea lanes must for stability & economic progress*

INS Visakhapatnam, a P15B stealth guided missile destroyer, was commissioned into the Indian Navy in the presence of Raksha Mantri Shri Rajnath Singh at the Naval Dockyard, Mumbai on November 21, 2021. The event marks the formal induction of the first of the four 'Visakhapatnam' class destroyers, indigenously designed by the Indian Navy's in-house organisation Directorate of Naval Design and constructed by Mazagon Dock Shipbuilders Limited, Mumbai.

In his address, the Raksha Mantri termed INS Visakhapatnam as a symbol of the growing maritime prowess of the country and a major milestone in achieving Prime Minister Shri Narendra Modi's vision of 'Make in India, Make for the World'. He added that the ship is a reminder of ancient and medieval India's maritime power, shipbuilding skills and glorious history. Shri Rajnath Singh exuded confidence that the state-of-the-art ship, equipped with latest systems and weapons, will strengthen the maritime security and protect the interests of the Nation. He defined the ship as one of the most technologically advanced guided missile destroyers in the world which will cater to the present & future requirements of the Armed Forces and the Nation as a whole.

Shri Rajnath Singh appreciated the self-reliance efforts of the Indian Navy, terming Navy's order of 39 of the 41 ships and submarines from Indian shipyards as a testament to their commitment towards achieving 'Aatmanirbhar Bharat'. He described the development of Indigenous Aircraft Carrier 'INS Vikrant' as an important milestone in their path to achieve 'Aatmanirbharta'. "The carrier will increase our reach from the Indian Ocean to the Pacific and Atlantic Ocean. Its commissioning will be a golden moment in the history of the Indian Defence. It will be the best occasion to celebrate the 75th anniversary of India's independence and the 50th anniversary of India's victory in 1971 war," he said.

The Raksha Mantri praised the Indian Navy's consistent efforts to participate in various outreach programmes of the industries and increase indigenised items under 'Float', 'Move' and 'Fight' categories. Stressing on the need to maintain the momentum, he expressed confidence that "the steps taken by the government will continue to provide boost to the self-reliance efforts and we

will soon build ships not just for India, but for the entire world". He assured of Government's continuous support to achieve this vision.

Saying that global security reasons, border disputes and maritime dominance have forced countries to move towards strengthening their military power, Shri Rajnath Singh exhorted the public & private sector to take advantage of Government's policies, work together and make India an indigenous shipbuilding hub. He listed out a number of reforms undertaken by the Government through which the public and private sector companies can make their mark in the international market. The steps include simplification of licensing process; speeding up Acceptance of Necessity (AoN) & Request for Proposal (RFP) process; setting up of Defence Industrial Corridors in Uttar Pradesh & Tamil Nadu; positive indigenous lists of over 200 items; Defence Acquisition Procedure 2020 and earmarking around 64 per cent of its modernisation funds under capital acquisition budget for 2021-22 for procurement from domestic companies.

The Raksha Mantri emphasised on the need to keep the Indo-Pacific region open, safe and secure, terming it as the primary objective of the Indian Navy. He asserted that India's interests are directly linked with the Indian Ocean and the region is crucial for the world economy. "Challenges such as piracy, terrorism, illegal smuggling of arms and narcotics, human trafficking, illegal fishing and damage to the environment are equally responsible for affecting the maritime domain. Therefore, the role of the Indian Navy becomes very important in the entire Indo-Pacific region," he added. The Raksha Mantri underscored the importance of a rule-based freedom of navigation and security of sea lanes in the present era of globalisation to ensure stability, economic progress and development of the world.

Shri Rajnath Singh reiterated that India, as a responsible maritime stakeholder, is a supporter of consensus-based principles and a peaceful, open, rule-based and stable maritime order. "In the 'United Nations Convention on the Law of the Sea' (UNCLOS) of 1982, territorial waters of nations, exclusive economic zones and the principle of 'Good order at sea' have been propounded. Some irresponsible nations, for the sake of their narrow partisan interests, keep on giving new and inappropriate interpretations to these international laws from hegemonic tendencies. The arbitrary interpretations create obstacles in the path of a rule-based maritime order. We envision a rule-based Indo-Pacific, with freedom of navigation, free trade and universal values, in which the interests of all the participating countries are protected," he said.

The Raksha Mantri lauded the Indian Navy for taking forward the Prime Minister's vision of SAGAR (Security and Growth for All in the Region) with the spirit of friendship, openness, dialogue and co-existence with the neighbours.

INS Visakhapatnam measures 163m in length, 17m in breadth with a displacement of 7,400 tonnes and can rightfully be regarded as one of the most potent warships to have been constructed in India. The ship is propelled by four powerful Gas Turbines, in a Combined Gas and Gas (COGAG) configuration, capable of achieving speeds in excess of 30 knots. The ship has enhanced stealth features resulting in a reduced Radar Cross Section (RCS) achieved through efficient shaping of hull, full beam superstructure design, plated masts and use of radar transparent materials on exposed decks.

The ship is packed with sophisticated state-of-the-art weapons and sensors such as Surface-to-Surface missile and Surface-to-Air missiles. It is fitted with a modern surveillance radar which provides target data to the gunnery weapon systems of the ship. The anti-submarine warfare capabilities are provided by the indigenously developed rocket launchers, torpedo launchers and ASW helicopters. The ship is equipped to fight under Nuclear, Biological and Chemical (NBC) warfare conditions.

A unique feature of this ship is the high level of indigenisation incorporated in the production, accentuating the national objective of 'Aatmanirbhar Bharat'. Some of the major indigenised equipment/system onboard INS Visakhapatnam include Combat Management System, Rocket Launcher, Torpedo Tube Launcher, Integrated Platform Management System, Automated Power Management System, Foldable Hangar Doors, Helo Traversing system, Close-in Weapon System and the Bow mounted SONAR.

Named after the historic city of Andhra Pradesh on the east coast, Visakhapatnam, the 'City of Destiny', the ship has a total complement of about 315 personnel. Enhanced crew comfort is a significant feature of INS Visakhapatnam, which has been ensured through ergonomically designed accommodation based on 'modular' concepts. The ship will be under the command of Captain Birendra Singh Bains, a Navigation & Direction specialist.

With the changing power dynamics in the Indian Ocean Region, INS Visakhapatnam will augment the Indian Navy's mobility, reach and flexibility towards accomplishment of its tasks and goals.

Chief of the Naval Staff Admiral Karambir Singh, Member of Parliament Shri Arvind Sawant, Flag Officer Commanding-in-Chief, Western Naval Command Vice Admiral R Hari Kumar, Chairman & Managing Director, Mazagon Dock Shipbuilders Limited Vice Admiral Narayan Prasad (Retd) and other senior civil & military officials of Ministry of Defence were present during the commissioning ceremony of INS Visakhapatnam.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1773700>



पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Sun, 21 Nov 2021 1:28PM

रक्षा मंत्री श्री राजनाथ सिंह की उपस्थिति में आईएनएस विशाखापत्तनम नौसेना डॉकयार्ड, मुंबई में भारतीय नौसेना में कमीशन किया गया

*स्वदेश में विकसित मिसाइल विध्वंसक आधुनिक निगरानी
रडार के साथ अत्याधुनिक हथियारों एवं सेंसरों से लैस*

रक्षा मंत्री ने इसे भारत की बढ़ती समुद्री ताकत का प्रतीक बताया

रक्षा मंत्री के उद्बोधन की प्रमुख बातें:

- आईएनएस विशाखापत्तनम समुद्री सुरक्षा को मजबूत करेगा और राष्ट्रीय हितों की रक्षा करेगा
- 'मेक इन इंडिया, मेक फॉर द वर्ल्ड' को प्राप्त करने की दिशा में एक विशाल छलांग
- सार्वजनिक-निजी भागीदारी जल्द ही भारत को एक वैश्विक जहाज निर्माण केंद्र बनाएगी
- भारतीय नौसेना का प्राथमिक उद्देश्य हिंद-प्रशांत को खुला, सुरक्षित क्षेत्र बनाए रखना है
- हम एक नियम आधारित हिंद-प्रशांत क्षेत्र की कल्पना करते हैं जिसमें सभी प्रतिभागी देशों के हितों की रक्षा हो
- स्थिरता एवं आर्थिक प्रगति के लिए समुद्र में नौवहन की नियम आधारित आज़ादी तथा सामुद्रिक गलियारों की सुरक्षा जरूरी

आईएनएस विशाखापत्तनम, जो एक पी15बी स्टील्थ गाइडेड मिसाइल विध्वंसक है, को रक्षा मंत्री श्री राजनाथ सिंह की उपस्थिति में दिनांक 21 नवंबर, 2021 को नेवल डॉकयार्ड, मुंबई में भारतीय नौसेना में शामिल किया गया। यह आयोजन स्वदेशी रूप से भारतीय नौसेना के इन-हाउस संगठन नौसेना डिजाइन

निदेशालय द्वारा डिजाइन किए गए और मझगांव डॉक शिपबिल्डर्स लिमिटेड, मुंबई द्वारा निर्मित विशाखापत्तनम श्रेणी के चार में से पहले विध्वंसक के नौसेना में औपचारिक रूप से शामिल किए जाने का प्रतीक है ।

अपने संबोधन में रक्षा मंत्री ने आईएनएस विशाखापत्तनम को देश की बढ़ती समुद्री शक्ति का प्रतीक और प्रधानमंत्री श्री नरेन्द्र मोदी के 'मेक इन इंडिया, मेक फॉर द वर्ल्ड' के दृष्टिकोण को प्राप्त करने में एक मील का पत्थर बताया। उन्होंने कहा कि यह पोत प्राचीन और मध्यकालीन भारत की समुद्री शक्ति, जहाज निर्माण कौशल और गौरवशाली इतिहास की याद दिलाता है। श्री राजनाथ सिंह ने विश्वास व्यक्त किया कि नवीनतम प्रणालियों और हथियारों से लैस यह अत्याधुनिक जहाज समुद्री सुरक्षा को मजबूत करेगा और राष्ट्र के हितों की रक्षा करेगा। उन्होंने इस जहाज को दुनिया में सबसे तकनीकी रूप से उन्नत गाइडेड मिसाइल विध्वंसक के रूप में परिभाषित किया जो सशस्त्र बलों और पूरे राष्ट्र की वर्तमान एवं भविष्य की आवश्यकताओं को पूरा करेगा।

श्री राजनाथ सिंह ने आत्मनिर्भरता की दिशा में भारतीय नौसेना के प्रयासों की प्रशंसा की, तथा 41 जहाजों और पनडुब्बियों में से 39 के भारतीय शिपयार्ड से नौसेना के आदेश को 'आत्मनिर्भर भारत' प्राप्त करने में उसकी प्रतिबद्धता के एक वसीयतनामा बताते हुए भारतीय नौसेना के आत्मनिर्भरता की दिशा में किए जा रहे प्रयासों की सराहना की। उन्होंने स्वदेशी विमानवाहक पोत 'आईएनएस विक्रांत' के निर्माण को 'आत्मनिर्भर भारत' प्राप्त करने की दिशा में एक महत्वपूर्ण मील का पत्थर बताया । उन्होंने कहा, "यह विमानवाहक हिंद महासागर से प्रशांत महासागर और अटलांटिक महासागर तक हमारी पहुंच बढ़ाएगा। इसकी कमीशनिंग भारतीय रक्षा के इतिहास में एक स्वर्णिम क्षण होगा। यह भारत की आजादी की 75वीं वर्षगांठ और 1971 के युद्ध में भारत की जीत की 50वीं वर्षगांठ मनाने का सबसे अच्छा अवसर होगा।"

रक्षा मंत्री ने उद्योगों के विभिन्न आउटरीच कार्यक्रमों में भाग लेने और 'फ्लोट', 'मूव' और 'फाइट' श्रेणियों के तहत स्वदेशी वस्तुओं को बढ़ाने के लिए भारतीय नौसेना के निरंतर प्रयासों की प्रशंसा की। गति को बनाए रखने की आवश्यकता पर बल देते हुए उन्होंने विश्वास व्यक्त किया कि "सरकार द्वारा उठाए गए कदम आत्मनिर्भरता के प्रयासों को बढ़ावा देना जारी रखेंगे और हम जल्द ही न केवल भारत के लिए, बल्कि पूरी दुनिया के लिए जहाजों का निर्माण करेंगे।" उन्होंने इस दृष्टिकोण को प्राप्त करने के लिए सरकार के निरंतर साथ का आश्वासन दिया।

यह कहते हुए कि वैश्विक सुरक्षा कारणों, सीमा विवादों और समुद्री प्रभुत्व ने दुनिया के देशों को अपनी सैन्य शक्ति को मजबूत करने पर बाध्य किया है, श्री राजनाथ सिंह ने सार्वजनिक और निजी क्षेत्र को सरकार की नीतियों का लाभ उठाने, मिलकर काम करने और भारत को एक स्वदेशी जहाज निर्माण केंद्र बनाने का आह्वान किया। उन्होंने सरकार द्वारा किए गए कई सुधारों का जिक्र किया जिसके माध्यम से सार्वजनिक और निजी क्षेत्र की कंपनियां अंतरराष्ट्रीय बाजार में अपनी पहचान बना सकती हैं। इन कदमों में लाइसेंसिंग प्रक्रिया का सरलीकरण; आवश्यकता की स्वीकृति (एओएन) और प्रस्ताव के लिए अनुरोध (आरएफपी) प्रक्रिया में तेजी लाना; उत्तर प्रदेश और तमिलनाडु में रक्षा औद्योगिक गलियारों की स्थापना; 200 से अधिक वस्तुओं की सकारात्मक स्वदेशी सूची; रक्षा अधिग्रहण प्रक्रिया 2020 और घरेलू कंपनियों से खरीद के लिए 2021-22 के पूंजी अधिग्रहण बजट के तहत अपने आधुनिकीकरण कोष का लगभग 64 प्रतिशत हिस्सा; जैसे कदम शामिल हैं ।

रक्षा मंत्री ने हिंद-प्रशांत क्षेत्र को खुला और सुरक्षित रखने की आवश्यकता पर जोर देते हुए इसे भारतीय नौसेना का प्राथमिक उद्देश्य बताया। उन्होंने जोर देकर कहा कि भारत के हित सीधे हिंद महासागर से जुड़े हुए हैं और यह क्षेत्र विश्व अर्थव्यवस्था के लिए महत्वपूर्ण है। उन्होंने आगे कहा, "समुद्री डोमेन को प्रभावित करने के लिए समुद्री डकैती, आतंकवाद, हथियारों और नशीले पदार्थों की अवैध तस्करी, मानव तस्करी,

अवैध मछली पकड़ने और पर्यावरण को नुकसान जैसी चुनौतियां समान रूप से जिम्मेदार हैं। इसलिए पूरे हिंद-प्रशांत क्षेत्र में भारतीय नौसेना की भूमिका बहुत महत्वपूर्ण हो जाती है।" रक्षा मंत्री ने विश्व की स्थिरता, आर्थिक प्रगति और विकास सुनिश्चित करने के लिए वैश्वीकरण के वर्तमान युग में नौवहन की नियम-आधारित स्वतंत्रता और समुद्री मार्गों की सुरक्षा के महत्व को रेखांकित किया ।

श्री राजनाथ सिंह ने दोहराया कि भारत, एक जिम्मेदार समुद्री हितधारक के रूप में, सर्वसम्मति-आधारित सिद्धांतों और शांतिपूर्ण, खुली, नियम-आधारित और स्थिर समुद्री व्यवस्था का समर्थक है । 1982 के 'संयुक्त राष्ट्र कन्वेंशन ऑन द लॉ ऑफ द सी' (यूएनसीएलओएस) में, देशों के क्षेत्रीय जल, विशेष आर्थिक क्षेत्र और 'समुद्र में अच्छी व्यवस्था' के सिद्धांत को प्रतिपादित किया गया है। कुछ गैर-जिम्मेदार राष्ट्र, अपने संकीर्ण पक्षपातपूर्ण हितों के लिए, इन अंतरराष्ट्रीय कानूनों की आधिपत्य की प्रवृत्तियों से नई और अनुचित व्याख्याएं देते रहते हैं। मनमानी व्याख्याएं नियम-आधारित समुद्री व्यवस्था के मार्ग में बाधा उत्पन्न करती हैं।

उन्होंने कहा, "हम नेविगेशन की स्वतंत्रता, मुक्त व्यापार और सार्वभौमिक मूल्यों के साथ एक नियम-आधारित हिंद प्रशांत क्षेत्र की कल्पना करते हैं, जिसमें सभी भाग लेने वाले देशों के हितों की रक्षा की जाती है ।"

रक्षा मंत्री ने पड़ोसियों के साथ मित्रता, खुलेपन, संवाद और सह-अस्तित्व की भावना के साथ सागर (क्षेत्र में सभी के लिए सुरक्षा एवं विकास) के प्रधानमंत्री के दृष्टिकोण को आगे बढ़ाने के लिए भारतीय नौसेना की सराहना की।

आईएनएस विशाखापत्तनम की लंबाई 163 मीटर, चौड़ाई 17 मीटर है और विस्थापन की इसकी क्षमता 7,400 टन है और इसे भारत में निर्मित सबसे शक्तिशाली युद्धपोतों में से एक माना जा सकता है। जहाज को एक कंबाइंड गैस एंड गैस (सीओजीएजी) विन्यास में चार शक्तिशाली गैस टर्बाइनों द्वारा संचालित किया जाता है, जो 30 समुद्री मील से अधिक गति प्राप्त करने में सक्षम है। जहाज ने स्टील्ड विशेषताओं को बढ़ाया है जिसके परिणामस्वरूप घटा हुआ राडार क्रॉस सेक्शन, फुल बीम सुपरस्ट्रक्चर डिजाइन, प्लेटेड मस्तूल सुनिश्चित किए जा सके हैं, साथ ही खुले हुए डेक पर राडार पारदर्शी सामग्री का इस्तेमाल भी किया गया है ।

जहाज अत्याधुनिक हथियारों और सतह से सतह पर मार करने वाली मिसाइल और सतह से हवा में मार करने वाली मिसाइल जैसे सेंसर से लैस है। यह एक आधुनिक निगरानी रडार से सुसज्जित है जो जहाज के तोपखाने की हथियार प्रणालियों को टारगेट डेटा प्रदान करता है। पनडुब्बी रोधी युद्ध क्षमताएं स्वदेशी रूप से विकसित रॉकेट लॉन्चर, टारपीडो लॉन्चर और एएसडब्ल्यू हेलीकॉप्टरों द्वारा प्रदान की जाती हैं। जहाज परमाणु, जैविक और रासायनिक (एनबीसी) युद्ध की स्थितियों के तहत लड़ने के लिए सुसज्जित है।

इस जहाज की एक अनूठी विशेषता उत्पादन में शामिल उच्च स्तर का स्वदेशीकरण है, जो 'आत्मनिर्भर भारत' के राष्ट्रीय उद्देश्य पर जोर देता है । आईएनएस विशाखापत्तनम के कुछ प्रमुख स्वदेशी उपकरण/सिस्टम में कॉम्बैट मैनेजमेंट सिस्टम, रॉकेट लॉन्चर, टारपीडो ट्यूब लॉन्चर, इंटीग्रेटेड प्लेटफॉर्म मैनेजमेंट सिस्टम, ऑटोमेटेड पावर मैनेजमेंट सिस्टम, फोल्डेबल हैंगर डोर्स, हेलो ट्रेवर्सिंग सिस्टम, क्लोज-इन वेपन सिस्टम और बो माउंटेड सोनार शामिल हैं ।

पूर्वी तट पर आंध्र प्रदेश के ऐतिहासिक शहर, विशाखापत्तनम- 'द सिटी ऑफ डेस्टिनी' के नाम पर इस जहाज में लगभग 315 कर्मों हैं। चालक दल के लिए अधिक सुविधा आईएनएस विशाखापत्तनम की एक महत्वपूर्ण विशेषता है, जिसे 'मॉड्यूलर' अवधारणाओं के आधार पर एर्गोनॉमिक रूप से डिज़ाइन किए गए

एकोमोडेशन के माध्यम से सुनिश्चित किया गया है। यह जहाज नेविगेशन और डायरेक्शन विशेषज्ञ कैप्टन बीरेंद्र सिंह बैस की कमान में होगा।

हिंद महासागर क्षेत्र में बदलते शक्ति समीकरणों के साथ आईएनएस विशाखापत्तनम अपने कार्यों और लक्ष्यों की प्राप्ति के लिए भारतीय नौसेना की गतिशीलता, पहुंच और लचीलेपन को बढ़ाएगा।

नौसेना प्रमुख एडमिरल करमबीर सिंह, संसद सदस्य श्री अरविंद सावंत, फ्लैग ऑफिसर कमांडिंग-इन-चीफ, पश्चिमी नौसेना कमान वाइस एडमिरल आर हरि कुमार, अध्यक्ष और प्रबंध निदेशक, मझगांव डॉक शिपबिल्डर्स लिमिटेड वाइस एडमिरल नारायण प्रसाद (सेवानिवृत्त) और आईएनएस विशाखापत्तनम के कमीशनिंग समारोह के दौरान रक्षा मंत्रालय के अन्य वरिष्ठ नागरिक तथा सैन्य अधिकारी उपस्थित थे।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1773791>



Sat, 20 Nov 2021

PM hands over Advanced Electronic Warfare System 'Shakti' to Navy in UP

Prime Minister also presented the miniaturised model of Shakti EW System to the Chief of the Naval Staff at Jhansi Fort under the ongoing three-day 'Raksha Samarpan Parv', which will conclude today

Jhansi (Uttar Pradesh): Prime Minister Narendra Modi on Friday handed over an advanced electronic warfare system 'Shakti' to the Navy in the Jhansi city of Uttar Pradesh.

Shakti is meant for interception, detection, classification, identification and jamming of conventional and modern radars. It is developed by Defence Research and Development Organisation (DRDO) for the capital warships of the Navy.

Prime Minister also presented the miniaturised model of Shakti EW System to the Chief of the Naval Staff at Jhansi Fort under the ongoing three-day 'Raksha Samarpan Parv', which will conclude today.



Shakti is developed by DRDO for the capital warships of the Navy.

"Shakti will augment navy's electronic intelligence capability for early warning, ships' defence against missile attack, intelligence, surveillance and reconnaissance for maritime domain awareness and ensure electronic dominance in the maritime battlefield," it was announced in the event.

Twelve Shakti Systems, developed by Defence Electronics Research Laboratory of DRDO, are under production at Bharat Electronics Ltd trusted with more than fifty MSMEs at a total cost of ₹ 1,805 crores, said officials known with the development.

"First Shakti system has been installed on-board INS Visakhapatnam and second Shakti system is being installed on-board Indigenous Aircraft carrier, INS Vikrant," officials said.

"Further, systems are scheduled to be installed on-board capital warships under production including P-15B, P-17A and Talwar class follow-on ships," officials added.

In pursuance of the constant quest to enhance the capabilities of EW systems, the officials said that the Shakti system would replace earlier generation indigenous EW Systems.

According to the officials, Shakti is a true symbol of Atmanirbhar Bharat in the areas of advanced defence technologies.

The Prime Minister also handed over DRDO designed and Bharat Electronics Limited (BEL) manufactured advanced EW suite for naval ships including that for Indian Aircraft Carrier Vikrant. The advanced EW suite will be used in different naval ships including destroyers, frigates etc. and marks a big step towards 'Aatmanirbhar Bharat'.

(This story has not been edited by NDTV staff and is auto-generated from a syndicated feed.)

<https://www.ndtv.com/india-news/pm-hands-over-advanced-electronic-warfare-system-shakti-to-navy-in-up-2617527>



Sat, 20 Nov 2021

PM Modi hands over 'Made in India' combat chopper to IAF, advanced warfare suite to Navy in Jhansi

PM Modi formally hands over HAL's light combat helicopter to Indian Air Force, DRDO designed & BEL-manufactured Advanced Electronic Warfare suite for naval ships to the Indian Navy

Highlights

- *PM Modi handover DRDO's EW suite for Naval ships to the Indian Navy*
- *The ceremony was held as part of Rashtra Raksha Samarpan Parv at Jhansi*
- *PM Modi lays foundation stone of Rs 400 cr UP Defence Industrial Corridor project*

Prime Minister Narendra Modi visited Uttar Pradesh's Mahoba and Jhansi districts on Friday and launched multiple development projects. The Prime Minister inaugurated multiple projects in Mahoba and then visited Jhansi to dedicate to the nation multiple initiatives of the Defence sector at 'Rashtra Raksha Samarpan Parv', which commenced here on November 17 as part of 'Azadi Ka Amrit Mahaotsav' celebrations.

To give a thrust to Aatmanirbhar Bharat in the defence sector, the Prime Minister formally handed over indigenously designed and developed equipment to Armed forces Service Chiefs. These include handing over of Hindustan Aeronautics Limited (HAL) designed and developed Light Combat Helicopter (LCH) to Chief of the Air Staff; drones/UAVs designed and developed by Indian startups to Chief of the Army Staff; and Defence Research and Development Organisation (DRDO) designed and Bharat Electronics Limited (BEL) manufactured Advanced Electronic Warfare suite for naval ships to the Chief of Naval Staff.

The LCH incorporates advanced technologies and stealth features for effective combat roles. The deployment of Indian UAVs by Indian Armed Forces is also a proof of the growing maturity of the Indian drone industry ecosystem.

The Advanced Electronic Warfare (EW) System 'Shakti' has been designed and developed by Defence Electronics Research Laboratory (DLRL) Hyderabad a laboratory of DRDO for Capital Warships of the Indian Navy for the interception, detection, classification, identification and jamming of conventional and modern Radars. The Shakti EW system will provide an electronic layer of defence against modern radars and anti-ship missiles to ensure electronic dominance and survivability in the maritime battlefield.

This system will replace the earlier generation EW Systems of the Indian Navy, the Ministry of Defence said in a statement. The system has been integrated with the wideband Electronic Support



PM Modi handed over Made in India Light Combat Helicopter to the IAF during a ceremony in UP's Jhansi.

Measures (ESM) and Electronic Counter Measure (ECM) for the defence of Indian Navy Ships against missile attacks. The ESM of the system helps in finding accurate direction and interception of modern radars. The system has a built-in radar fingerprinting and data recording replay feature for post-mission analysis.

First Shakti system has been installed on-board INS Visakhapatnam and is being installed on-board Indigenous Aircraft Carrier, INS Vikrant. Twelve Shakti Systems are under production at Bharat Electronics Ltd (BEL) supported by more than fifty MSMEs at a total cost of Rs 1805 crores. These systems are scheduled to be installed on-board capital warships under production, including P-15B, P-17A and Talwar class follow-on ships. Defence Minister Rajnath Singh congratulated DRDO, Indian Navy and Industry Partners for the development of the Shakti EW System.

PM also launched the National Cadet Corps (NCC) Alumni Association and become first member of the association. The PM also inaugurated the National programme of simulation training for NCC cadets with the aim to scale up simulation training facilities for all the three wings of NCC.

Modi also dedicated to the nation augmented reality powered electronic kiosks at the National War Memorial, New Delhi which will enable visitors to pay floral homage to martyrs through the simple click of the button

The Prime Minister also inaugurated Atal Ekta Park in Jhansi. Named after former Prime Minister Shri Atal Bihari Vajpayee, the park has been built at a cost of over Rs 11 crore, and is spread across an area of about 40,000 square metres. It will also house a library, as well as a statue of Shri Atal Bihari Vajpayee. The statue has been built by the renowned sculptor Ram Sutar, the man behind the Statue of Unity.

<https://www.indiatvnews.com/news/india/jhansi-new-defence-projects-inaugurations-live-updates-pm-modi-handovers-shakti-ew-system-drdo-light-combat-helicopter-drones-indian-navy-745705>

IIT-Delhi sets up sponsored research parks for research worth Rs 700cr

New Delhi: The Indian Institute of Technology Delhi (IIT-D) is setting up sponsored research parks for various private companies to facilitate collaborative research and development of advanced technology.

The institute has received proposals of over Rs 700 crore from various private firms for industry partnership.

Several government institutions have also invested crores for doing collaborative research on a large scale with the IIT-D.

The Defence Research and Development Organisation (DRDO) is planning to invest around Rs 500 crore to design and develop defence equipment in collaboration.

At the special parks, which is being set up within the college campus, many big NGOs will also participate to promote industry collaboration.

These parks will be equipped with modern laboratories and supporting infrastructure to facilitate the research work of more than 100 companies. According to IIT-D Director V. Ramgopal Rao, several industries have shown interest in conducting sponsored research at the special parks, which have been set up in association with the DRDO, and have also invested in it.

The Tata Group has given over Rs 50 crore for conducting research. The DRDO, which has so far invested Rs 264 crore of the total Rs 500 crore, used to import defence machineries previously.

Now they can now develop these state-of-the-art technologies indigenously, he added. In addition to this, the Indian Navy, Ashoka University, National Law University Delhi (NLUD), Indraprastha Institute of Information Technology Delhi (IIITD), Indian Institute of Petroleum and Energy, Visakhapatnam (IPE) and the Bharat Heavy Electricals have also signed MoUs with IIT-D to establish avenues of engagement with industry, transfer knowledge and create value.

Anant Yardi, an IIT-D alumnus, has contributed \$10 million to the institute to support its state-of-the-art laboratories and its newly-established 'School of Artificial Intelligence'. Yardi, who is currently based in the US. was a student of IIT-D in the 60s. According to Rao, with this type of contribution will assist IIT-D in fostering development of new research each day. IANS

<https://www.tribuneindia.com/news/jobs-careers/iit-delhi-sets-up-sponsored-research-parks-for-research-worth-rs-700cr-341057>

आईआईटी दिल्ली में स्पॉन्सर्ड रिसर्च, 700 करोड़ रुपए के प्रस्ताव हैं उपलब्ध

नई दिल्ली: देश में काम कर रही निजी कंपनियों को अब अपने उत्पाद बेहतर और विकसित करने के लिए आईआईटी दिल्ली का साथ मिलेगा। आईआईटी दिल्ली इन निजी कंपनियों के लिए विशेष स्पॉन्सर्ड रिसर्च पार्क शुरू करने जा रही है। आईआईटी इस प्रकार की प्रायोजित (स्पॉन्सर्ड) रिसर्च और कोलैबोरेटिव अनुसंधान पर जोर देगी। संस्थान के पास इस फिलहाल प्रकार की स्पॉन्सर्ड रिसर्च के लिए निजी कंपनियों से 700 करोड़ रुपये से अधिक के प्रस्ताव हैं।

देश के कई बड़े उद्योग व कंपनियां रिसर्च के लिए न केवल आईआईटी की मदद लेंगी बल्कि स्वयं आईआईटी के साथ मिलकर रिसर्च भी करेंगी। कई सरकारी संस्थान तो पहले से ही व्यापक पैमाने पर आईआईटी दिल्ली के साथ कोलैबोरेटिव रिसर्च कर रहे हैं। रक्षा उपकरणों को विकसित करने वाला डीआरडीओ, आईआईटी दिल्ली में इसके लिए 500 करोड़ रुपए का निवेश कर रहा है।

स्पॉन्सर्ड रिसर्च के लिए आईआईटी में विशेष रिसर्च पार्क भी बनाया जा रहा है। आईआईटी दिल्ली के इस रिसर्च पार्क में देश की कई बड़ी गैर सरकारी संस्थाओं की भागीदारी होगी।

आईआईटी परिसर में 100 से अधिक उद्योगों के लिए यह रिसर्च पार्क होगा। संस्थान ने इस पहल के लिए आधुनिक प्रयोगशालाओं और सहायक बुनियादी ढांचे की स्थापना की है। आईआईटी दिल्ली के निदेशक वी.राम गोपाल राव के मुताबिक 100 से अधिक कंपनियों ने कैंपस में इस प्रकार की स्पॉन्सर्ड रिसर्च को लेकर दिलचस्पी दिखाई है। इनमें से कई कंपनियों ने इसमें निवेश भी किया है। टाटा समूह ने स्पॉन्सर्ड रिसर्च के तहत आईआईटी दिल्ली को 50 करोड़ दिए हैं।

आईआईटी के निदेशक वी. रामगोपाल राव ने कहा कि रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) के साथ मिलकर इस प्रकार का एक एडवांस सेंटर आईआईटी दिल्ली में बनाया गया है।

डीआरडीओ रक्षा उपकरण विकसित करने वाला सरकारी संस्थान है। डीआरडीओ अभी तक विभिन्न परियोजनाओं, रिसर्च एवं उपकरणों के विकास हेतु आईआईटी दिल्ली को 265 करोड़ रुपए दे चुका है। आईआईटी दिल्ली के निदेशक ने बताया कि 100 से अधिक विशेषज्ञ फैकेल्टी मेंबर डीआरडीओ की समस्याओं का समाधान जुटाने के लिए रिसर्च वर्क में लगे हैं।

डीआरडीओ के साथ मिलकर की जा रही इस रिसर्च का एक बड़ा फायदा यह हुआ है कि अभी तक बड़ी तादाद में डीआरडीओ को उपकरणों का आयात विदेशों से करना पड़ता था लेकिन अब इस रिसर्च के चलते आयात में भारी कमी आई है। आईआईटी दिल्ली के सहयोग से डीआरडीओ के बेहतरीन उपकरण देश में ही तैयार किए जा रहे हैं।

डीआरडीओ भारत सरकार के रक्षा मंत्रालय का आर एंड डी विंग है, जो अत्याधुनिक रक्षा प्रौद्योगिकियों और महत्वपूर्ण रक्षा प्रौद्योगिकियों और प्रणालियों में आत्मनिर्भरता हासिल करने के लिए कार्य करता है।

इसके अलावा भारतीय नौसेना, अशोक विश्वविद्यालय, राष्ट्रीय विधि विश्वविद्यालय, दिल्ली (एनएलयूडी), इंद्रप्रस्थ सूचना प्रौद्योगिकी संस्थान दिल्ली (आईआईआईटीडी), भारतीय पेट्रोलियम और ऊर्जा संस्थान, विशाखापत्तनम (आईआईपीई) भारत हेवी इलेक्ट्रिकल्स आदि ने आईआईटी दिल्ली के साथ एमओयू किए हैं।

वहीं आईआईटी दिल्ली के एक पूर्व छात्र अनंत यार्डी आईआईटी दिल्ली को 10 मिलियन अमरीकी डालर यानी करीब का योगदान दिया है। यार्डी यह योगदान आईआईटी दिल्ली में अत्याधुनिक प्रयोगशालाओं और नए स्थापित किए गए स्कूल ऑफ आर्टिफिशियल इंटेलिजेंस को बढ़ावा देने के लिए कर रहे हैं। अनंत फिलहाल अमेरिका में रह रहे हैं। 60 के दशक में वह आईआईटी दिल्ली के छात्र थे।

आईआईटी दिल्ली के निदेशक का कहना है कि इस प्रकार के योगदान से दिल्ली आईआईटी की क्षमता का विकास हो सकेगा एवं नए शोध किए जा सकेंगे।

<https://newstodaynetwork.com/desh/%E0%A4%86%E0%A4%88%E0%A4%86%E0%A4%88%E0%A4%9F%E0%A5%80-%E0%A4%A6%E0%A4%BF%E0%A4%B2%E0%A5%8D%E0%A4%B2%E0%A5%80-%E0%A4%AE%E0%A5%87%E0%A4%82-%E0%A4%B8%E0%A5%8D%E0%A4%AA%E0%A5%89%E0%A4%A8%E0%A5%8D%E0%A4%B8%E0%A4%B0%E0%A5%8D%E0%A4%A1-%E0%A4%B0%E0%A4%BF%E0%A4%B8%E0%A4%B0%E0%A5%8D%E0%A4%9A-700-%E0%A4%95%E0%A4%B0%E0%A5%8B%E0%A4%A1%E0%A4%BC-%E0%A4%B0%E0%A5%81%E0%A4%AA%E0%A4%8F-%E0%A4%95%E0%A5%87/cid5794403.htm>

THE TIMES OF INDIA

Sat, 20 Nov 2021

PM Modi lays foundation stone of UP Defence Corridor project worth Rs 400 crore in Jhansi

Jhansi: Prime Minister Narendra Modi on Friday laid the foundation stone of the Uttar Pradesh Defence Industrial Corridor project worth Rs 400 crores in Jhansi.

The Prime Minister laid the foundation stone of the much-awaited significant project on the concluding three-day 'Rashtra Raksha Samarpan Parv' event being organized by the Ministry of Defence (MoD) along with the government of Uttar Pradesh here in the city.

The Centre has decided to set up two Defence Industrial Corridors in the country-- one in Tamil Nadu and the other in Uttar Pradesh. The Uttar Pradesh Defence Industrial Corridor has nodes at Agra, Aligarh, Jhansi, Chitrakoot, Lucknow and Kanpur.



For the Jhansi node of the Uttar Pradesh Defence Industrial Corridor, the state government has made nearly 1,034 hectares of land made available.

Bharat Dynamics Ltd, a Defence Public Sector Undertaking (DPSU), is setting up a plant for the propulsion system for Anti-Tank Guided Missiles in the Jhansi node. It will be spread over 183 acres of land in Jhansi. The facility will involve an investment of Rs 400 crores.

The project is expected to provide direct employment to 150 people and indirect employment to nearly 500 people.

Besides, the Prime Minister dedicated and launched several new initiatives of MoD to the nation in a grand ceremony organized in the precincts of Jhansi Fort.

The Ministry of Defence has taken several steps to promote 'Aatmanirbhar Bharat' in defence in the last two years. These include the issue of positive indigenization lists, earmarking of 64 per cent of capital procurement budget for the domestic industry, promotion of startups under

Innovations For Defence Excellence (iDEX) initiative, speeding up of capital acquisition process and setting up of Defence Industrial Corridors among others.

As a demonstration of the thrust on 'Aatmanirbhar Bharat', the Indian Army, Indian Air Force and Indian Navy are adopting indigenously designed and developed platforms for their use. Three platforms were formally handed over by the Prime Minister to respective Service Chiefs in the event. These platforms depict maturing of the Indian defence industry ecosystem with contributions from Defence Research and Development Organization (DRDO), DPSUs and Defence industry and startups.

<https://timesofindia.indiatimes.com/india/pm-modi-lays-foundation-stone-of-up-defence-corridor-project-worth-rs-400-crore-in-jhansi/articleshow/87803112.cms>



Mon, 22 Nov 2021

BDL's new unit at Jhansi to make missile propulsion systems

The systems will be used in anti-tank guided missiles and futuristic missiles

Hyderabad: Bharat Dynamics Limited (BDL) chairman and managing director Commodore Siddharth Mishra (Retd) said that the upcoming Jhansi unit will be manufacturing propulsion systems to be used in all anti-tank guided missiles and futuristic missiles manufactured by the company on Saturday.

“This is an important step towards the backward integration plan being implemented to further strengthen the capability to deliver world-class weapon systems. We propose to invest up to ₹400 crore for various technologies at this location,” he said.

The upcoming unit will be the sixth manufacturing unit and the first one in northern part having its registered office here.

Prime Minister Narendra Modi had laid the foundation stone for setting up this manufacturing unit in Uttar Pradesh in the ‘Defence Corridor’ on Friday in the presence of Defence Minister Rajnath Singh, Chief Minister Yogi Adityanath and other dignitaries.

The company has acquired the land and is planning to commence operations by 2023, which would create lot of employment opportunities for people in the region once fully operational with many ancillary units in the small, medium and micro enterprises to come up.

The Ministry of Defence firm is one among the few companies in the world having state-of-the-art facilities for manufacture and supply of anti-tank guided missiles, surface-to-air missiles, air-to-air missiles, air-to-surface missiles, underwater weapons and counter measures systems for the armed forces, informed the CMD in an official release. BDL has also designed and developed drone-delivered bombs and the focus will continue to be on the concept of indigenisation across its programmes with the average percentage between 80-90%.

“This philosophy helped us reduce the import cost and offer competitively priced products to the armed forces. This has been very important factor since the armed forces are getting latest products with assured product life cycle support from BDL,” said Mr. Mishra.

In line with the ‘AatmaNirbhar Bharat’ initiative of the Government, BDL has furthered its indigenisation processes by involving several vendors including MSMEs, who indigenise components through the ‘Srijan’ portal, he said and pointed out the firm has a ‘robust vendor echo system’ and a strong supply chain spread across the county.

The strong in-house R&D division with talent drawn from premier institutions has been leveraging emerging technologies like Artificial Intelligence (AI) to develop state-of-the-art weapons including next generation missile programmes.

Agreements were signed with foreign original equipment manufacturers and start-up companies to develop weapons of next generation. Torpedoes were exported to a friendly 'foreign' country and other leads were being explored, the released added.

<https://www.thehindu.com/news/cities/Hyderabad/bdls-new-unit-at-jhansi-to-make-missile-propulsion-systems/article37616874.ece>



Sun, 21 Nov 2021

HAL gears up to manufacture 30 Light Combat Helicopters a year, has order to make 150 of them for IAF, Army

By Ravi Sharma

Buoyed by the maiden delivery of its indigenously designed, developed and manufactured Light Combat Helicopter (LCH) to the Indian Air Force (IAF), Hindustan Aeronautics Limited (HAL) has announced that it is embarking on a grandiose plan to produce around 30 LCHs per annum.



According to A.R. Madhvan, HAL's Chairman and Managing Director, the defence major is on cue to deliver, within a year, the 15 twin-engine, 5.8-tonne-class attack helicopters that the IAF has ordered. HAL, he added was looking at a total order of 150 LCHs for both the IAF and the Army.

On November 20, a spokesperson for HAL said: "HAL has proactively initiated advance action towards launching the production activities of 15 LCH LSP (limited series production) with internal funding. Material procurement for all the 15 helicopters have been completed. Three helicopters are ready for delivery to users and the balance helicopters are in advanced stages of production. In addition, HAL has initiated various planning activities and has drawn a detailed master plan for achieving the peak rate production capacity of 30 helicopters per annum in order to cater to production of balance 145 LCHs."

Prime Minister Narendra Modi had symbolically handed over the first of the LCHs to Chief of the Air Staff Air Chief Marshal Vivek Ram Chaudhari at a function at Jhansi, Uttar Pradesh, on November 19.

The genesis for the LCH goes back to 1999, when post the Kargil war, the need was felt in the IAF, for an effective helicopter weapons platform that could deliver precision strikes at high altitude. The design and development of the LCH was sanctioned by the government in October 2006, with the Indian Army joining the programme in December 2013, leading to a total projected requirement of 160 LCHs.

While the IAF issued its air staff qualitative requirements (ASQRs) in July 2016 for a batch of limited series production helicopters, the platform's Initial Operational Clearance (IOC) was accorded by the Centre for Military Airworthiness and Certification (CEMILAC) in August 2017. Subsequently, the Indian Army variant was cleared by CEMILAC in February 2019. HAL is hopeful, that the LCH, which is a unique helicopter in its class and weight category, will find takers from overseas as well.

<https://frontline.thehindu.com/dispatches/hal-gears-up-to-manufacture-30-light-combat-helicopters-a-year-has-order-to-make-150-of-them-for-iaf-army/article37595373.ece>

HAL to deliver first Light Combat Aircraft Tejas Mk-1A in March 2024

The government had placed an order to procure 83 LCA Tejas Mk-1A aircraft for the Indian Air Force worth around Rs 47,000 crore to HAL

By Anish Kumar

Jhansi: In a major boost to India's Aatmanirbhar Bharat initiative, the state-owned plane maker, HAL will deliver the first Light Combat Aircraft Tejas Mk-1A in March 2024.

Sharing the details about the status of the aircraft, HAL CMD R Madhavan said, "We have got an order last year during the Aero India show. After that we started working on that. We are supposed to deliver the first one in T0+36, inclusive of design." The design activity is already going on and "by next year middle we plan to fly first prototype of this configuration. We are sure that we can finish the testing before the deadline," the HAL CMD said.



The government had placed an order to procure 83 LCA Tejas Mk-1A aircraft for the Indian Air Force worth around Rs 47,000 crore to HAL. The aircraft will come with several enhancements from its previous variant. It will be equipped with AESA radar, external self-protection jammer pods, advanced beyond-visual-range (BVR) missiles and digital radar warning receivers missiles among others.

The order was placed amidst the depleting squadrons of the IAF. In a scenario of two-front war, Indian Air Force required 42 squadron to deal with the crisis. Currently, it stands around 32 with four to retire in next two years.

Giving an impetus to indigenisation, the government is pushing for the home-made fighter jets. For procurement of 114 Multirole Combat Aircraft, the government has floated a tender.

Days after taking charge as IAF chief, ACM VR Chaudhari had said that the project to induct 114 aircraft would be carried out under Make in India project. He also added that these aircraft would replace the fleets of Jaguars, Mirages and MiG-29s.

Prime Minister Narendra Modi will be handing over one LCH helicopter to the IAF chief, ACM VR Chaudhari at Jhansi.

The Cabinet Committee on Security has cleared to procure 15 LCH for the Indian Armed Forces, including 10 for IAF and 5 for the Indian Army.

Expressing confidence, Madhavan said that "we are capable to deliver 15 helicopters within a year." It is pertinent to mention here that the LCH was used in Ladakh last year amidst the ongoing border tension with the China's PLA in the region. The chopper is fully tried and tested in extremely tough circumstances operating at over 16,000 feet with new weapon systems.

"This will be proven to be a very important successful product for us as well as to IAF and the Army. There is no helicopter as such of this kind with our armed forces. This is the first helicopter in the weight category and the capability we look at," the HAL CMD said. He further added that since its a home-made system as and when IAF decides on any other weapon systems it can be easily and smoothly integrated on to the helicopter. "We are looking for an order of 150 plus," he added.

<https://newsable.asianetnews.com/india-defence/hal-to-deliver-first-light-combat-aircraft-tejas-mk-1a-in-march-2024-dnm-r2tmss>

Rajnath commissions Navy's most capable warship INS Visakhapatnam

The 7,400-tonne ship is the lead vessel in a new class of four guided missile destroyers that Mazagon Dock Ltd, Mumbai is building under Project 15B

By Ajai Shukla

The Indian Navy commissioned its tenth destroyer on Sunday, the 7,400-tonne Indian Naval Ship (INS) Visakhapatnam. This is the lead vessel in a new class of four guided missile destroyers that Mazagon Dock Ltd, Mumbai (MDL) is building under Project 15B for Rs 35,800 crore, or Rs 8,950 crore per vessel.

The next three Project 15B destroyers will join the navy's fleet at one-year intervals. They are named INS Mormugao, Imphal and Surat.

The tradition of naming the navy's destroyers after Indian cities began with Project 15 – which yielded INS Delhi in 1997, INS Mysore in 1999 and INS Mumbai in 2001.

This was followed by Project 15A, with Prime Minister Narendra Modi commissioning the lead warship, INS Kolkata, in MDL on 16 Aug 2014. INS Kolkata was followed by INS Kochi in 2015 and INS Chennai in 2016.

However, even after all four destroyers of Project 15B are commissioned, the navy will have to make do with just 10 destroyers, since three old Rajput-class vessels, which were bought from Moscow in the mid-1980s, are on the verge of being decommissioned from service.

In contrast, China's navy – the People's Liberation Army (Navy), or PLA(N) – has a fleet of 42 destroyers. These include four massive 13,000 tonne Renhai-class cruisers known as the Type 055; 21 modern 7,500 tonne Luyang III-class destroyers known as the Type 052; six older 7,000 tonne Luyang II-class destroyers known as the Type 052C; and eleven older and less capable destroyers of the Type 051C, 052B, 051B, 052 and the Soviet-era Sovremenny-class.

Undeterred by the PLA(N)'s overwhelming numerical advantage, Defence Minister Rajnath Singh sharply criticised China, without naming it, for eroding the "rule-based and stable maritime order" and "freedom of navigation and security of sea lanes".

Upholding the United Nations Convention on the Law of the Sea (UNCLOS) of 1982 as the basis for good order at sea, Singh stated: "Some irresponsible nations, for the sake of their narrow partisan interests, keep on giving new and inappropriate interpretations to these international laws from hegemonic tendencies. These arbitrary interpretations create obstacles in the path of a rule-based maritime order."

"We envision a rule-based Indo-Pacific, with freedom of navigation, free trade and universal values, in which the interests of all the participating countries are protected," he said.

The defence minister appreciated the navy's self-reliance efforts, pointing out that 39 of the 41 warships and submarines on order, including the first indigenous aircraft carrier, INS Vikrant, are being built in Indian shipyards.

INS Visakhapatnam will be the navy's most potent warship. It is propelled by four gas turbines that allow it to travel in excess of 30 knots (55 kilometres per hour). The warship incorporates stealth features, with a reduced radar cross section (RCS) achieved through efficient shaping of



Defence minister Rajnath Singh (left) and Admiral Karambir Singh (right) at the commissioning of INS Visakhapatnam

hull, full beam superstructure design, plated masts and use of radar transparent materials on exposed decks.

Its weapons and sensor suite is world class, with protection against enemy aircraft and incoming anti-ship missiles being provided out to 70 kilometres by the eponymous Indo-Israeli Medium Range Surface-to-Surface Missile (MR-SAM), coupled with the Multi-Function Surveillance and Threat Alert Radar (MF-STAR).

The destroyer's ground attack capability and anti-ship capability is achieved through a bank of Indo-Russian BrahMos cruise missiles that are fired through vertical launch canisters to targets up to 295 kilometres away. The 76 millimetre main gun is built in Bharat Heavy Electricals Ltd, Haridwar.

Protection against submarines are provided by indigenous rocket launchers, torpedo launchers and anti-submarine warfare (ASW) helicopters. The ship is equipped with nuclear, biological and chemical (NBC) warfare protective equipment, with its entire requirement of air being filtered through NBC filters.

INS Visakhapatnam has achieved a 75 per cent indigenisation level through an indigenous combat management system (CMS), rocket and torpedo launchers, and digitised control systems such as an integrated platform management system (IPMS), automated power management system (APMS), foldable hangar doors, helo traversing system, close-in weapon system and bow mounted sonar.

Even the DMR 249A warship-grade steel that the Visakhapatnam is built from has been indigenously manufactured by the Steel Authority of India Ltd (SAIL)

The ship has a total complement of about 315 personnel. Its first commanding officer will be Captain Birendra Singh Bains.

https://www.business-standard.com/article/current-affairs/rajnath-commissions-navy-s-most-capable-warship-ins-visakhapatnam-121112100614_1.html

Speed of over 30 knots, equipped with indigenous weapons: Know more about INS Visakhapatnam

Addressing the commissioning ceremony, defence minister Rajnath Singh said that with the successful commissioning of INS Visakhapatnam, there should be no doubts that India in future will not only build ships for itself but also for the entire world

By Harshit Sabarwal, Edited by Meenakshi Ray

New Delhi: INS Visakhapatnam, the first stealth-guided missile destroyer ship of Project 15B, was commissioned on Sunday at the naval dock in Mumbai in the presence of defence minister Rajnath Singh.

Addressing the commissioning ceremony, Rajnath Singh said that with the successful commissioning of INS Visakhapatnam, there should be no doubts that India in future will not only build ships for itself but also for the entire world.

“Not just Make in India, we will also accomplish the dream of Make for the World,” the defence minister said during the ceremony.

The Centre earlier said in a statement that INS Visakhapatnam will reaffirm India’s presence amongst an elite group of countries with the capability to design and build advanced warships.



Defence minister Rajnath Singh receives a memento from Chief of Naval Staff Admiral Karambir Singh during the commissioning ceremony of the INS Visakhapatnam, at the naval base in Mumbai on November 21, 2021. (AFP)

Here is what you need to know more about the destroyer ship:

1. INS Visakhapatnam was constructed using indigenous steel DMR 249A. It is among the largest destroyers made in the country and has an overall length of 163 metre and displacement of over 7,400 tonne.
2. The ship is capable of undertaking multifarious tasks and missions spanning the full spectrum of maritime warfare.
3. INS Visakhapatnam is equipped with major indigenous weapons such as indigenous medium range surface to air missile systems, surface to surface missiles, torpedo tubes and launchers.
4. It also has medium and short-range guns, anti-submarine rockets and advanced electronic warfare and communication suits.
5. The ship has a capacity of accommodating 312 crew members and has an endurance of 4,000 nautical miles.
6. It is propelled by a powerful combined gas and gas propulsion which enables the speed of more than 30 knots. The ship can also embark by a powerful combined gas and gas propulsion which enables.
7. INS Visakhapatnam comprises a very high level of automation along with sophisticated digital networks. It also has a combat management system and an integrated platform management system.

<https://www.hindustantimes.com/india-news/indian-navy-commissions-ins-visakhapatnam-know-more-about-the-destroyer-ship-101637480640418.html>

INS Visakhapatnam to join Navy, know its specialty

By Nikesh Mandal

Today, INS Visakhapatnam is set to join the Indian Navy. Let me tell you all that the induction of INS Visakhapatnam will greatly enhance India's maritime strength. Let me tell you that it has been made with 75% indigenous equipment under the Self-Reliant India Campaign. In fact, INS Visakhapatnam is considered to be one of the most powerful warships built in India.



Let me tell you all that INS Visakhapatnam was designed by the Directorate of Naval Design. It has been built by Mazagon Dockyard Limited. It is part of the Navy's Project P15B. According to reports, Defence Minister Rajnath Singh will formally induct INS Visakhapatnam into the Indian Navy at the Naval Dockyard in Mumbai today.

Chief of the Naval Staff Admiral Karambir Singh is the Chief Guest at the function where Singh is the guest of honour. Let me tell all of you that INS Visakhapatnam was built using indigenous steel DMR 249A and is one of the largest destroyers manufactured in India, with a total length of 163 metres and displacement of more than 7400 tonnes.

What is INS the specialty of Visakhapatnam:

- Equipped with 32 Barak 8 missiles to avoid airstrikes.
- The missile hits the surface to the air.
- 6 BrahMos is equipped with missiles.
- Maximum speed 55. 56 kmph.
- Four gas turbine engines provide strength.

<https://english.newstracklive.com/news/navy-inducts-ins-visakhapatnam-mc23-nu612-ta325-1193760-1.html>

This innovative Ladakhi greenhouse is letting farmers grow tomatoes in freezing winter

Designed and developed by a team of researchers at the Defence Institute of High Altitude Research (DIHAR) led by senior scientist Dr Tsering Stobdan, Ladakhi farmers now have a passive solar greenhouse that allows them to grow vegetables throughout the year.

By Rinchen Norbu Wangchuk, Edited by Yoshita Rao

In Ladakh, the availability of locally grown fresh vegetables is usually restricted to summer months given how the region is characterised by extreme variations in temperature, particularly during the long and harsh winter season when temperatures hit as low as -30°C .

(Above image of a farmers inside the Ladakh Greenhouse growing tomatoes)

These long winters reduce the cropping season to barely four or five months in a year. Other factors include low precipitation largely in the form of heavy snowfall, high wind velocity, sparse plant density, thin atmosphere with high volumes of UV radiation and a fragile ecosystem.

As a consequence, most farmers pursue single-cropping, while double cropping is only possible in parts of Ladakh, which fall under the altitude of 3,000 metres above mean sea level.

The lack of locally grown vegetables necessitates obtaining them from outside the region through goods trucks that come from Manali (480 km) and Srinagar (420 km) and cargo planes from Delhi or Chandigarh where the freight costs sometimes go up to Rs 110 per kg.

Prices were soaring so high during the winter season that in 2019 the Leh district administration had to artificially fix the retail price of fresh vegetables like tomato (Rs 110/kg), okra (Rs 130/kg), cauliflower (Rs 110/kg) and spinach (Rs 110/kg), just to name a few. In fact, according to a market survey organised in February 2019, it was found that fresh vegetables are nearly three times costlier in Leh than they are in Delhi during the winter season.

To address this critical concern of the Ladakhi people, researchers at the Defence Institute of High Altitude Research (DIHAR) led by senior scientist Dr Tsering Stobdan have developed a new model of the Ladakh Greenhouse, a passive solar greenhouse, for local farmers.

“We studied the positives and drawbacks of traditional greenhouses, which are used extensively in Ladakh. Accordingly, four major changes were made. We replaced the polyethylene sheet with a triple layer polycarbonate sheet. This results in over 7-8 degree Celsius increase in temperature at



(Above image of a farmers inside the Ladakh Greenhouse growing tomatoes)



Ladakh Greenhouse covered in snow during peak winter months



The older iteration of the passive solar greenhouse

night during the winter season since polycarbonate has much better insulating properties. Second, the unbaked mud bricks were replaced with stone walls since the latter has more heat absorbing capacity. The heat absorbed during day time is released back into the greenhouse at night. Third, we have constructed the greenhouse three feet below the ground level. Therefore, the ground heat helps in keeping the greenhouse warm in winter. Finally, we standardised the length, height and width of the greenhouse,” says Dr Stobdan, speaking to The Better India.

The three different standardised Ladakh Greenhouse Models include:

- 1) Commercial: 90x27x9 feet (length x Width x Height) — approximate cost: Rs 9.5 lakh
- 2) Medium: 60x24x8.5 feet — approximate cost: Rs 5 lakhs
- 3) Domestic: 32x18x8 feet — approximate cost: Rs 3 lakh

“The general perception is that the smaller the greenhouse the better is its heat retention capacity. However, we found that the reverse is true. Easily hand operated ventilators in these newly designed and developed greenhouses make it easy to regulate the temperature during summer months. Inside the Ladakh Greenhouse, the maximum temperature recorded is 45 degree Celsius in summer months. The lowest temperature recorded in peak winter months is 1 degree Celsius. That’s the reason why tomatoes are growing inside the greenhouse. Moreover, it is easy to operate. There is not even a single electronic gadget that farmers have to use here. It is entirely a passive solar greenhouse,” explains Dr. Stobdan.

“DIHAR developed the technology, but they have transferred it to the Department of Agriculture, UT Ladakh. The installation of the Ladakh Greenhouse is being done by the department. We are providing farmers with 75% subsidy for the construction of this greenhouse. Thus far, we have installed about 100 such greenhouses for farmers in Ladakh, which include the Medium type one and for domestic use,” says Tashi Tsetan, the Chief Agricultural Officer of UT (Union Territory) Ladakh.

“During the installation process, the farmer’s job is only to construct the walls. The department has to provide cladding materials (polycarbonate sheets), frame, door and window and ventilators, etc,” Tsetan adds.

Evolution of Greenhouses

Nonetheless, this isn’t the first version of a greenhouse to emerge in Ladakh. The first such greenhouse (glasshouse) in Ladakh was set up in 1964 at DIHAR, which was formerly known as Field Research Laboratory, for growing vegetables during winter months. When this didn’t work due to logistics and high costs, they conceived a low cost passive solar greenhouse in the late 1960s, where vegetables were ground in trenches covered with polyethylene sheets to prevent crops from getting frozen during the long and harsh winter season.

Given the lack of a retention wall above ground level and openness, the produce fell prey to stray animals. Making matters worse, the rate of adoption of this greenhouse was low. To address this, the first version of the Ladakhi Greenhouse was designed with mud brick walls on three sides (north, east and west), polyethylene cover on the south facing side and a roof on the side of the north wall. This innovation was popular for its greater heat retention abilities, allowing farmers in Ladakh to grow leafy vegetables like lettuce, spinach and coriander during winter.

Over the years, other agencies and organisations like GERES (Groupe Energies Renouvelables, Environnement et Solidarités), a French non-profit, Ladakh Environment and Health Organisation (LEHO), Ladakh Renewable Energy Development Agency (LREDA) and Sher-e-Kashmir University of Agriculture Sciences and Technology-Kashmir (SKUAST-K) have come with their modifications to the original Ladakhi Greenhouse model.

However, other concerns emerged with the first iteration of the Ladakhi Greenhouse. Certain vegetables like tomatoes, capsicum, cauliflower, cabbage, pumpkin and broccoli couldn’t grow because of freezing temperatures at night inside the greenhouse during winter months. During summer months, there was the issue of excessive heat generation inside the greenhouse with temperatures inside rising to a whopping 64 degrees Celsius. Farmers either would remove the cladding material or not use the greenhouse altogether during the summer season.

Also, the polyethylene sheet used in this greenhouse wouldn't last more than five years because of high wind speeds, heavy snowfall, and other extreme conditions and required either replacing or constant repairs. Finally, these greenhouses wouldn't last more than 10 years.

New and Improved Greenhouse

“We started working on this greenhouse in 2014. It took us three years to develop the first functional prototype. Our criteria for a functional greenhouse is growing tomatoes, a highly temperature-sensitive crop during winter seasons without any external heat/power source. In December 2017 we grew tomatoes inside the greenhouse for the first time. The new design was then studied further during the winter and summer for growing a variety of vegetables in Leh Ladakh. Our successful trials led to the designing of improved greenhouses of different sizes to meet varied farmer requirements based on availability of land and resources,” says Dr. Stobdan.

“I installed the Ladakh Greenhouse in October 2019 with support from the Defence Research & Development Organisation (DRDO). This is the third winter season where I have employed it. Prior to installing this greenhouse, I had installed two smaller ones covered in polyethylene sheets. The problem with these older greenhouses was that after November, they would freeze up inside. Last winter, I grew cauliflower, cabbage, spinach, methi, radish, tomatoes, mustard and coriander. After sowing these crops in October, by December I harvest my spinach. Cauliflower and the rest, I harvest in January,” says Tashi Tondup Angyal, a 56-year-old farmer from Thiksey, who was among the first adopters of a medium type greenhouse.

According to a document authored by nine researchers under the aegis of DIHAR in 2019, some of the salient features of the new and improved Ladakh Greenhouse include the walls on the east, west and north sides built with stone and cement, which they argue requires minimal maintenance. “The wall on [the] north side inside the greenhouse is used for fixing racks that can be used for different purposes. An outer mud-brick wall with insulation in between the two walls has also been studied,” explains the document (no link, a source shared it with me).

The second element to the new Ladakh Greenhouse is the use of “transparent UV stabilised triple layer polycarbonate panel is used for covering the south face of the greenhouse,” which they argue “has better heat retention capacity” and “retains an acceptable transparency even after 20 years of exposure to harsh climatic conditions of Ladakh”.

Another change to the earlier iterations of the old passive solar greenhouses is the use of sloped (to the north) Polyurethane Foam (PUF) roof which is durable, “has better insulation properties as compared to conventional wooden roofs” and “does not allow growth of molds and fungus”, which is a major concern in conventional Ladakhi greenhouses with wooden roofs.

Besides employing PUF, the other option is to go for a rust-resistant pre-coated “GI sheet topped with a layer of hay and soil as insulating material is also used for roofing”. Then, there are metallic or polycarbonate doors on the east well that require very little maintenance and manually, but easily operated, ventilators with metallic frames as well.

The temperature inside these greenhouses remains above freezing, even in December and January. With an extended shelf-life of up to 25 years, farmers can now cultivate crops all through the year.

“A variety of crops have been successfully grown inside the greenhouse during winter months—cauliflower, cabbage, broccoli, knol-khol, tomato and even mushroom. In a medium greenhouse one can obtain up to 325 kg of cauliflower/ greenhouse; 398 kg cabbage/ greenhouse; and 231 kg knol-khol/ greenhouse in Leh. These crops cannot grow well in traditional greenhouses. In the winter months, a variety of crops can be grown, which otherwise is not possible in a traditional greenhouse. During the summer months, a crop like cucumber would ordinarily enjoy a harvest from August onwards in the open field. Grown inside this greenhouse, however, harvest comes earlier in June, and we enjoy a higher crop yield of 4.5 kg per plant as opposed to 1.6 kg per plant on the open field — a 3-fold increase in crop productivity,” says Dr Stobdan.

“During the last winter season, after taking into account the vegetables we consumed in-house, we earned around Rs 75,000 from all the crops grown inside the Ladakh greenhouse. During the

summer months, leafy vegetables like coriander, spinach and radish don't grow very well. Instead, we grow tomatoes, okra, capsicum, brinjal, chilies, etc. Since we started using this greenhouse, I have cumulatively earned about Rs 1.75 lakh from all the crops grown inside excluding the items we consume in-house. Thanks to this greenhouse, my income from farming has increased. We are now easily able to grow vegetables during peak winter months in our greenhouse where we use polycarbonate sheets. In the summer, cauliflower sells for Rs 50 per kg, but by winter (January) we get about Rs 110 per kg," claims Tondup.

But even without this financial assistance, Dr Stobdan believes farmers can break-even on the investment they made on the greenhouse in six years.

"Our target is to ensure locals have access to green vegetables during the peak winter season. We have seen in these greenhouses that when the temperature outside is -30 degrees Celsius, inside it's 10 degrees Celsius. Besides farmers, entrepreneurs and other residents who can't find work during the winter season, can also earn well during the winter season by growing and selling all these vegetables which have a ready market. We have even made a crop calendar for farmers, helping them navigate what they can grow throughout the year in the greenhouse. Besides installation, we also give them some training about what crops they can grow during spring, summer and winter seasons," says Tsetan.

In the long run, the objective is to reduce dependence on fresh vegetables from outside the region — both during summer and winter. For this, the Ladakh UT administration's target is to establish 1,000 greenhouses in Ladakh, including Leh and Kargil district, in the next two years.

<https://www.thebetterindia.com/266439/this-innovative-ladakhi-greenhouse-is-letting-farmers-grow-tomatoes-in-freezing-winter/>

China raises red flag as Indian Army deploys ‘By far the most powerful weapon’ along the disputed border

By Ayush Jain

Since May 2020, the Indian Army and the Chinese PLA have been engaged in a bitter standoff at one of the harshest terrains in the world, Ladakh.

A place where one can get a sunburn and frostbite at the same time, matters do get serious especially with the onset of winters. The situation further worsens with the mass buildup of soldiers and military equipment.

It is no secret that the Indian Armed Forces are one of the most experienced armies in mountain warfare, having an active military presence even in Siachen Glacier – the highest battlefield on Earth.

They are further complemented by the Indo-Tibetan Border Police (ITBP), the one-of-its-kind paramilitary organization with expertise in high-altitude patrolling.

India has fought seven major wars and conflicts in the Himalayas and is constantly engaged in COIN and CT (Counter-Insurgency and Counter-Terrorism) operations. On the contrary, the PLA has the advantage of better technology and rapid transport infrastructure in the region but is restricted by the disadvantages of distant high-altitude airfields and experience.

Both nations have deployed highly destructive surface-to-surface cruise missiles which play a major role in acting as a deterrent for a full-scale escalation along the borders. The Indian deployment of BrahMos (supersonic) and Nirbhay (subsonic, nuclear-capable) cruise missiles, has made the PLA top brass uneasy.

Beijing has warned India against this deployment and has reciprocated by increasing its own missile deployments, calibrated to hit targets across the LAC. It is quite apparent that China does not take the deployment of BrahMos lightly.

BrahMos – Supersonic Cruise Missile

BrahMos is arguably “the only operational” and most versatile supersonic cruise missile in the world, having ship-launched, submarine-launched, air-launched, and terrain-launched variants for use by all three services.

Having a range of 300 kilometers and being supersonic all through flight, the missile can hit its target with pinpoint accuracy. Interestingly, India’s entry into the Missile Technology Control Regime (MTCR) has allowed for range-extension projects, and the country successfully tested the first extended-range BrahMos last year in September.

The range increases considerably when fired from an aerial platform, and in 2017 the Indian Air Force successfully tested a trisonic-class missile against a sea target.

The IAF announced the complete integration of BrahMos-A, the air-launched variant to the Su-30MKI in December 2019.

According to the BrahMos Aerospace Pvt Ltd, a joint venture between India and Russia responsible for the development of the missile, BrahMos provides many additional features compared to contemporary missiles such as 9 times more kinetic energy, 3 to 4 times more seeker range, 2.5 to 3 times more flight range, and 3 times more velocity.



A file photo of India test-firing the BrahMos missile

The missile also stands out in terms of ‘fire and forget’ principle of operation, high supersonic speed all through the flight, modularity, a lower radar signature, quicker engagement and reaction time, and pinpoint accuracy with high lethal power aided by large kinetic energy on impact.

Why Speed and Agility Matter

The prime feature of the BrahMos missile is its supersonic speed, which enables it to surpass most air defense systems in the world. In addition, it is designed to have a low radar signature, enhancing its survivability.

When the missile approaches the target, it performs an ‘S’ maneuver to decrease its probability of being intercepted. The successive variants employ even more complicated steep dive maneuvers to engage targets behind a mountain range.

BrahMos Aerospace is also working on BrahMos-II, a hypersonic (Mach 8) version of the missile having a range of over 600 kilometers. A shorter, lighter ‘NG’ variant is also being developed having the same range and speed as the current system.

Being lighter and more advanced, this variant will be ideal for arming IAF aircraft for precision strikes, and even the new P-75I class of submarines.

The Indian Navy has deployed warships in the South China Sea armed with BrahMos missiles, and also enjoys dominance over the Malacca Strait having its military bases in the Andaman Islands in close proximity to this vital chokepoint. This firepower edge provides the Indian warships with immense capabilities and a credible deterrence against the increasingly dominant and aggressive behavior of China.

The deployment of the BrahMos shows “India’s unstoppable greedy ambition to encroach on western China’s territory”, Song Zhongping, a Chinese military expert was quoted as saying Global Times, thus putting the entire onus of the conflict on New Delhi even as Beijing stays non-committal on the de-escalation matter.

Indian military expert who did not wish to be named said BrahMos cruise missile, by far, is the most powerful weapon deployed by the Indian Army along the disputed border. There is no doubt that the supersonic missile can wreak havoc on enemy defenses and military bases, but its deployment means adding more tensions on the border as China would now be forced to deploy similar missiles along the LAC.

<https://eurasianimes.com/china-raises-red-flag-as-indian-army-deploys-by-far-the-most-powerful-weapon-along-the-disputed-border/>

Chinese Naval forces may be ahead of India, but our ships hold key in Indian Ocean region

By Kanchan Sharma

The Indian Navy's warships, though lesser in number than that of PLAN, have ensured that in the event of a face-off either on land border or at sea, China's Malacca dilemma becomes its Indian Ocean dilemma.

Mazagon Dock Shipbuilders Limited (MDL) handed over the first Project 15B ship of Visakhapatnam Class to the navy last month in Mumbai. It will be a few months before she is commissioned and joins the fleet. On commissioning she will be christened INS Visakhapatnam, to be followed by Mormugao, Imphal and possibly Porbandar.



Visibly, the ship doesn't appear to be much different from her predecessors of project 15A ships (Kolkata, Chennai and Kochi); however, there are many upgrades that make the ship more potent and less visible to enemy radars.

The backbone of the electronics will ride Ethernet base affording the systems a much higher data rate for weapon systems and therefore greater accuracy. Electronic warfare systems have been upgraded to state-of-the-art and so has been the Combat Management System [indigenous].

These are indigenous, in addition to surface-to-surface and surface-to-air missiles. While Brahmos are a standard SSM fit, the LRSAM has an extended range built jointly with Israel. The surface search radar of yesteryears, Garpun, has been replaced by an indigenous radar built by the private sector.

A closer examination of the upper deck will reveal a number of stealthy features. The superstructure is more compact with improved area ruling. The helicopter hangar to has modifications, the helicopter traversing gear is railless. The deck protrusions have been designed for radar signature suppression. Even the heavy machine gun mounting on the deck is electro-optically controlled, thereby reducing the devices which needed mechanical and large fittings.

How does it alter the power equation in the Indian Ocean Region [IOR] or the Indo-Pacific vis-à-vis China?

CCP's Navy is larger than the US Navy; China's aim is to replace the US from its position as the unipolar hegemon of the world. China's economy, which is five times larger than India's, has recently overtaken the US as the largest economy in the world in GDP terms. When it comes to military technology, the US is likely to remain in leadership position for the foreseeable future. China is catching up quickly.

In US congressional hearings, the American generals and admirals have warned that China has overtaken the US in the areas of cyber, space and artificial intelligence. The recent test by China of sending a hypersonic missile around the globe and then targeting a pre-designated zone on the surface of the earth has sounded warning bells in the Pentagon. China has also established its own space station, Tiangong, positioned in low earth orbit between 340 and 450 km above the earth's surface. This station gives China the ability to research and explore outer space and possibly provide guidance to space-based weapons.

Therefore, India is not in military competition with China. While China has global ambitions, India sees its role in the IOR and the Indo-Pacific for specific tasks in partnership with the US, Japan and Australia. The destroyers of 15B Class add to the maritime muscle of India in the IOR.

Geography favours India in the IOR, with its long peninsula penetrating right in the middle of the Indian Ocean. Chinese maritime assets have a long distance to travel from Chinese ports to operate in the Indian Ocean, making them vulnerable to interdiction. China's nearly 80 per cent energy is sourced from Gulf, Africa and South America; all of which has to traverse the Indian Ocean and finally pass through the choke points in Malacca, Sunda and Lombok straits, making it susceptible to blockade.

The US has made it amply clear that no single Navy can ensure maritime security in the vast Indo-Pacific and therefore this congregation of Quad countries comprising Australia, Japan, India and the US. Indian Navy has a stated policy of its MBD (Mission Based Deployment) at seven sensitive locations in the IOR. The naval assets are so deployed 24x7 to link up with the Fusion Centre of IOR located in Gurugram, affording very robust Maritime Domain Awareness, key component of maritime security. This too is a cooperative architecture in which over 30 countries are participating. Five countries have positioned their naval liaison officers to the centre. White shipping data is shared by all participating countries and the fused picture is shared with all of them. It alarms the participants of any unauthorised presence of an unidentified vessel that could become a threat. The destroyers have the ability to traverse at high speeds and close the vessel for further action.

Present-day destroyers have multiple capabilities. In addition to long-range strikes against surface targets by their 16 Supersonic Brahmos missiles, they also have a credible defence against air or missile attack with their 32 long-range Barack Ng surface-to-air missiles. In addition, these ships are fitted with one of the best SONAR systems in the world, Humsa Ng, which is indigenous. The fire control system is wired with powerful anti-submarine rockets and torpedoes leaving little chance for the adversary's submarine to escape. The electronic warfare suites make the ship capable of jamming opposition radars and active homing missile warheads.

The close-in weapon systems are very unforgiving. With Delhi Class and Project 15A ships, Visakhapatnam and follow on ships make the fleets very potent. These ships are comparable to the best in the class anywhere in the world. The majority of ships built in India are the best examples of 'aatmanirbhar' India.

Warship building in India is very advanced. Having begun in the late 1960s with Leanders, today we build world-class ships. India has exported ships to friendly foreign countries. The ecosystem associated with shipbuilding has established a number of MSMEs, which serves as a source of employment. Being the largest and strongest resident Navy in the IOR, India is a preferred partner of the majority of countries in the IOR. Therefore, the handing over of this destroyer also reflects India's industrial prowess.

Unfortunately, China does not enjoy this reputation. It has few friends which leave it virtually fighting its own battles in the oceans. Cooperative arrangements amongst navies are necessary for maritime security of the oceans.

Chinese leader Hu Jintao had spoken of China's Malacca dilemma because of its dependence and vulnerability on this strait, so very essential for its energy security. China has been creating alternate routes overland by laying pipelines and offloading its crude in ports from where it can be transported over land and thereby reducing the passage of crude carriers through Malacca and other straits in Indonesian waters. The Indian Navy's warships, though lesser in number than that of PLAN, have ensured that in the event of a face-off either on land border or at sea, China's Malacca dilemma becomes its Indian Ocean dilemma.

(The writer is former Commander-in-Chief of Western Naval Command and Trustee, India Foundation. Views expressed are personal.)

<https://toysmatrix.com/chinese-naval-forces-may-be-ahead-of-india-but-our-ships-hold-key-in-indian-ocean-region/>

Defence Strategic: National/International



Press Information Bureau
Government of India

Ministry of Defence

Sun, 21 Nov 2021 10:12AM

6th Edition of Indo-France joint military exercise “EX SHAKTI 2021” being conducted in France

The Sixth Edition of Indo - France joint military exercise “Ex SHAKTI 2021” has commenced at the Military School of Draguignan, France with an opening ceremony on 15 Nov 21. The Indian Army contingent is being represented by a composite team of three Officers, three Junior Commissioned Officers and 37 soldiers from a battalion of Gorkha Rifles and support Arms.

The training so far has focused on aspects of joint planning, mutual understanding of conduct of operations and identification of coordination aspects required for jointly operating in a Counter Terrorism environment under United Nations mandate. The participating contingents have also been put through paces of combat conditioning and tactical training which included firing drills and ‘battle hardening’ work sessions. The exercise is being conducted in two phases which will culminate with a grueling 36 hours exercise to validate the standards achieved during the two phases.

The contingent apart from joint training went to visit MAZARGUES War Cemetery in Marseilles where 1,002 Indian soldiers of the First World War have been cremated. The Indian and French contingents together presented a Guard of Honor and paid their homage to commemorate the valour of the fallen bravehearts.



<https://pib.gov.in/PressReleasePage.aspx?PRID=1773638>

Army, navy and IAF get 6 months to respond to theatre command final proposal

While the army and the navy are all for theatre commands, the air force is trying to reconcile with the division of its air assets among respective theatre commands

By Shishir Gupta

New Delhi: The department of military affairs (DMA) has given the Indian Army, Indian Navy and the Indian Air Force service headquarters six months till mid-2022 to respond to its final military theatre commands proposal before commencing the raising of much required rationalised structures for countering adversaries. China has already integrated theatre commands with mixed element brigades and is now helping Pakistan to also reform its warfighting systems with theatre commands.

New military paradigm
A look at why restructuring defence forces is crucial

STRATEGIC IMPORTANCE
China has already integrated theatre commands and is also helping Pakistan reform its armed forces

In China's PLA	In Indian forces
3,488km of LAC is handled by the Chinese Western Theatre Command including elements of the air force, armour, artillery and rocket regiments	At the LAC, there are three commands – northern, central and eastern command – of the Indian Army along with similar three commands of the Indian Air Force
<ul style="list-style-type: none"> PLA theatre commander reports to Central Military Commission (CMC) under President Xi Jinping 	<ul style="list-style-type: none"> Army and IAF report to their respective chiefs, who in turn report to the defence minister with a dotted line to the PM

WHY THE DELAY?
While Army and Navy are all for theatre commands, IAF is trying to reconcile with the division of its air assets among respective theatre commands

A hurdle is the fact that service chiefs will no longer be No. 1 in their branches, but only be responsible for training, prioritisation of hardware purchases

According to officials in the know of the developments, the DMA under Chief of Defence Staff General Bipin Rawat has sent the final structure to the three-service headquarters for giving their considered view in writing to the defence ministry in the next 180 days. It is understood that once the army, navy and the air force come back to DMA with their suggestions or objections before the process of raising theatre commands begins with senior military commanders indicating that the new commands will be functioning by end-2022.

While the army and the navy are all for theatre commands, the air force is trying to reconcile with the division of its air assets among respective theatre commands. Fuelling discontent and new hurdles against the theatre commands is the fact that the service chiefs will no longer be numero uno of the respective military branches but will only be responsible for training and prioritisation of hardware purchases as part of the committee headed by the permanent chief of staff or the CDS in this case. It is this resistance to change or reform by the three services and the pressure from the

retired ex-servicemen lobby that has led to the defence ministry consulting all and sundry for military theatre commands.

Fact is that while the entire 3488 of Line of Actual Control is handled by the Western Theatre Command of the PLA including elements of the air force, armour, artillery and rocket regiments, it is faced with three—northern, central and eastern command—of the Indian Army along with similar three commands of the Indian Air Force. While the PLA theatre commander directly reports to the Central Military Commission (CMC) under President Xi Jinping, the Indian Army and Indian Air Force report to their respective chiefs like in World War II and who in turn report to the defence minister with a dotted line to the Prime Minister of India.

Even the Indian Navy is divided into western and eastern commands, whose commanders report to Chief of Naval Staff, while the Andamans and Nicobar Commander, the key to any sea battle in future, reports to the Chief of Integrated Defence Staff or CISC. Simply put, all the services operate within their own silos and rarely are on the same wavelength on crucial issues facing the security of the nation. But for record's sake, all the services have been talking about joint manship or battle synergy since the 1999 Kargil war.

While India, often described as raucous and chaotic democracy, takes its own time to reform and rationalise the Indian military amidst continuous state, by-elections, and general elections, it is faced with as authoritarian Communist China ruled by a dictator for life and a quasi-democracy in Pakistan where the army is forever in power and rules the roost. Indian military must reform or else it will be surprised again by the PLA like it was in May 2020 on the banks of the Pangong Tso.

<https://www.hindustantimes.com/india-news/army-navy-and-iaf-get-6-months-to-respond-to-theatre-command-final-proposal-101637481379968.html>



Mon, 22 Nov 2021

Air Force to start upgrading Rafale Fighter fleet from January 2022: Report

India has already received around 30 of these planes and three more of them would be arriving in the country on December 7-8.

New Delhi: Having already received around 30 Rafale combat aircraft from France, the Indian Air Force would start upgrading its fleet of French-origin fighters from January 2022, with India-specific enhancements.

"A high-level team of Indian Air Force officers is in France to evaluate the performance of the testbed aircraft with tail number RB-008 at the Istres airbase there. The aircraft has been equipped with all the India Specific Enhancements agreed upon between the two sides in the 2016 contract," government sources told ANI.



The upgrade of the aircraft would be carried out at the Ambala Air Force Station (FILE)

Once the enhancements are approved and accepted by the IAF, the upgrade is planned to be started from January next year onwards making the Indian planes more capable," they said. The India specific enhancements would include integration of highly capable missiles, low band jammers and satellite communication systems as per Indian requirements.

India has already received around 30 of these planes and three more of them would be arriving in the country on December 7-8.

As per the contract schedule, sources in the Air Force said kits would be brought to India from France and every month, three to four Indian rafales would be upgraded to the ISE standards. The last aircraft to arrive in India from France would be the RB-008 named after the former air force

chief Air Chief Marshal RKS Bhadauria (retd) who played a crucial role as the Deputy Chief to sign the contract worth over ₹ 60,000 crore with France under a government to government deal with France.

The upgrade of the aircraft would be carried out at the Ambala Air Force Station which is the first base of the plane in the country.

The Indian Air Force has also started the training of its pilots on the aircraft within the country itself after training its personnel in France. Once inducted fully, the fleet would have eight twin-seater trainer planes with tail numbers in the RB series while 28 single-seaters with BS tail number series.

The BS tail numbers are in honour of the former air force chief Air Chief Marshal BS Dhanoa who retired in 2019 after leading the Balakot airstrikes of February 26 2019.

India is now planning to go ahead with the case for acquiring 114 multirole fighter aircraft for which a case is to be moved to the defence ministry by the IAF in near future.

<https://www.ndtv.com/india-news/air-force-to-start-upgrading-rafale-fighter-fleet-from-january-2022-report-2619217>

THE TIMES OF INDIA

Mon, 22 Nov 2021

Indian Navy enhancing surveillance capability with new-age tech in bid to counter China

New Delhi: With China's growing assertiveness in the Indian Ocean, the Navy is planning to increase acquisition of a sizeable number of unmanned aerial and underwater platforms in the next few years to boost surveillance in the region.

The acquisition will be made as part of a roadmap on unmanned platforms, which was finalised at a conference of the top naval commanders last month that had extensively deliberated on the need to procure new-age platforms, people familiar with the development told PTI.

Though the Navy will primarily focus on acquiring the unmanned platforms from within the country, it will also look at the best available drones and other related systems in the global market.

"The key focus will be to boost the surveillance in the strategically key waterways, in sync with developments in the Indian Ocean region," another source told PTI.

The people said the key focus has been to enhance the capabilities in the areas of long-range anti-submarine warfare (ASW), surveillance and reconnaissance.

In sync with the roadmap for unmanned platforms, a third aircraft carrier is set to be designed to accommodate both fighter jets and a fleet of drones, they said.

Indian armed forces have been focusing on procuring unmanned platforms, including armed drones, following the eastern Ladakh standoff with China and a drone strike on the Jammu airbase.

This comes at a time when the Indian Navy got further boost today with the commissioning of indigenously-built stealth guided missile destroyer INS Visakhapatnam.

Speaking after commissioning the destroyer, defence minister Rajnath Singh reiterated that Indo-Pacific being a key route is important for the world economy and it is the primary objective of the Indian Navy to keep it secure.



File photo used for representation

"Indo-Pacific is a key route and it is important for the world economy. It is the primary objective of the Indian Navy to keep the route secure," Singh said today while speaking at the commissioning ceremony of the INS Visakhapatnam in Mumbai.

Push for predator drones

Sources also said that Navy is pushing for the procurement of 30 multi-mission armed Predator drones from the US, which will cost over \$3 billion (around Rs 22,000 crore).

They said the government is likely to clear the deal by March next year.

A proposal to acquire the MQ-9B long-endurance drones, armed with air-to-ground missiles, is likely to be cleared by the Defence Acquisition Council (DAC) by next month.

Various key aspects of the procurement, including the cost component and the weapons package, have already been finalised.

Though the procurement proposal has been moved by the Indian Navy, all three services are likely to get 10 drones each.

The remotely piloted drones, manufactured by US defence major General Atomics, are capable of remaining airborne for around 35 hours and can be deployed on a range of missions including surveillance, reconnaissance, intelligence gathering and destroying enemy targets.

The medium-altitude long-endurance (MALE) Predator-B drone is the first hunter-killer unmanned aerial vehicle (UAV) designed for long-endurance and high-altitude surveillance.

Last year, the Indian Navy received two Predator drones on lease from the US, primarily for surveillance over the Indian Ocean. *(With inputs from PTI)*

<https://timesofindia.indiatimes.com/india/indian-navy-enhancing-surveillance-capability-with-new-age-tech-in-bid-to-counter-china/articleshow/87834252.cms>



Sat, 20 Nov 2021

India to deploy two S-400 systems by early 2022, changes game with China

Two S-400 air defence systems will be operational in India early 2022 as two Russian trained teams are ready for the job. The Indian systems will balance the tactical disadvantage posed by Chinese S-400 deployments across Ladakh and Arunachal LAC.

By Shishir Gupta

New Delhi: With the induction of at least two regiments of S-400 air defence systems on north and east borders of India beginning 2022, the Modi government will finally balance the tactical disadvantage faced by the military after PLA's surprise May 2020 transgressions on 1,597-km Ladakh Line of Control (LAC).

According to diplomats based in Moscow, the advance elements of S-400 systems have already started arriving in India with deep penetration radars of the two systems (in sequence) in place next month. The two S-400 systems will be operational by early 2022 to match the Chinese deployment of the same Russian system across the Ladakh and Arunachal LAC. Two Indian military teams, trained in Russia, are ready to operate the S-400 system, which has a reach of nearly 400 km into enemy territory.

That India has been able to get two S-400 complexes in a short time is due to very close relationship between



It is only due to personal equation with PM Modi, that Russian President Vladimir Putin has decided to come to New Delhi on December 6. The only other time President Putin stepped out of Russia this year was to meet US President Joe Biden at Geneva on June 16.

Russian President Vladimir Putin and Prime Minister Narendra Modi. It is for this reason that President Vladimir Putin is making second exception this year to step out of his country to meet Prime Minister Narendra Modi on December 6. While President Putin has received guests at Black Sea resort of Sochi, the only time he stepped out of Russia was to meet US President Joe Biden on June 16 at Geneva. He has only held virtual summit with Chinese President Xi Jinping in June this year and will not travel to Beijing despite the two countries having an annual summit format on lines with India. Despite raging Covid conditions, Russia allowed Indian S-400 teams to train and opened manufacturing facilities shut down during spread of coronavirus pandemic in the past two years.

When the PLA caught the Indian Army by surprise on north banks of Pangong Tso, Galwan and Gogra-Hot Springs on May 2020, it was quite evident that the Chinese had plans to unilaterally change the LAC by imposing an already rejected 1959 line on Ladakh. The Indian military was pushed on the back foot with the PLA retaining with troops and weapon systems who had come for annual exercises across the Ladakh LAC in 2020 spring.

With men of 16 Bihar under Col Santosh Babu showing raw courage against marauding PLA troops at Galwan on June 15, the Modi government moved to correct the disadvantage that the army found itself on Ladakh LAC. First was the induction of T-90 tanks using Chinook helicopters on Ladakh LAC all the way up to Daulet Beg Oldi (DBO) sector along with deployment of troops. Second step was the induction of omni-role nuclear capable Rafale fighters into the theatre with long-range air-to-air missiles to give air superiority and land attack cruise missiles. Third step, the most important one, was the brilliantly planned military operation that led to Indian Army occupying heights on south banks of Pangong Tso on August 29-31. With PLA's Moldo garrison being threatened by Indian Army, the Chinese got the message and the two sides sagaciously decided to dis-engage from both banks of the saltwater lake. However, there was still a tactical mismatch with the Chinese threatening the Indian Air Force with deployed S-400 systems at Ngari Gar Gunsu and Nyingchi air bases in occupied Aksai Chin and across Arunachal Pradesh.

With the induction of S-400 systems on Indian soil, the Modi government has a reply to Chinese missiles and air force in case of a worst case scenario. As one system will be deployed in north, it will take care of two fronts in Ladakh as the deep penetration radars of S-400 will be able to pick up any fighter or missile targeting India.

While the Chinese and the Indian sides only reiterating their respective positions during the last round of WMCC this month, the Indian S-400 capability will make Beijing realise the futility of keeping forward deployments on the Ladakh and Arunachal LAC. Ensuring peaceful and tranquil LAC is the only way out for both the Asian giants.

<https://www.hindustantimes.com/india-news/india-to-deploy-two-s-400-systems-by-early-2022-changes-game-with-china-101637382419359.html>

Pondicherry University signs Memorandum of Understanding with armed forces

Army officers will be able to pursue postgraduate degrees and research

Puducherry: The Pondicherry University has signed a Memorandum of Understanding (MoU) with the Indian Army (Training Command) to enable Army officers to pursue postgraduate studies and research in various departments of the university.

At the MoU signing held recently, Vice-Chancellor of Pondicherry University Gurmeet Singh said the institution would assist the armed forces in any academic research required without any hesitation. The university would be happy to extend maximum help to officers of the Indian Army to enrol in as many departments as possible apart from the departments covered under the MoU in the future, Prof. Singh said.

Major General Vivek Kashyap, who represented the Indian Army's Training Command, while appreciating the efforts taken by Pondicherry University in providing knowledge to the officers, said the Indian Army would try to send more young officers for various courses like nanoscience and technology, artificial intelligence, strategic studies and many other courses as per the requirements of the Indian Army in the forthcoming academic years.

Major General Kashyap said the Indian Army looked to collaborate with the academic institutions to utilise young minds and attract them to join the armed forces. He also interacted with Amaresh Samanthuraya, registrar i/c, deans and faculties of departments were present at the signing.

Major General Kashyap later visited various departments of the University along with Subramanyam Raju, dean of international relations and MoUs, and S.I. Humayun, coordinator (MoU-Defence Services).

<https://www.thehindu.com/news/cities/puducherry/pondicherry-university-signs-memorandum-of-understanding-with-armed-forces/article37617648.ece>



Expanding possibilities: Representatives of Pondicherry University and the Indian Army (Training Command) with copies of the memorandum.

Hybrid warfare is the future of wars

*Fourth generation warfare warfare would be non-linear
with no definable battlefields and actions would occur concurrently*

By Deepak Sinha

One need not be particularly perceptive or savvy to realise that our regional and internal security environment is extremely fraught and fragile at the present time. The US withdrawal from Afghanistan and the subsequent collapse of the Government there, much like a house of cards, did come as an unpleasant surprise, especially as it turns out that the Pakistan's ISI supported Haqqani Faction now calls the shots within the Taliban. No wonder then that Pakistan is becoming increasingly emboldened and has once again turned its attention with renewed vigour towards fomenting trouble in Jammu and Kashmir and Punjab.



In conjunction with this, there has also been a ratcheting up of tensions along the LAC with China. Along with its continued intransigence in Eastern Ladakh, it also carried out a major incursion in the Barahoti Sector. In addition, it has reportedly established a large village cum military encampment, allegedly on our side of the border, in Arunachal Pradesh, with fresh reports of another as well. There are also similar reports of establishment of four such villages within Bhutanese territory as well.

There are also reports that it is constructing an alternative route into the Chumbi Valley, through Bhutanese territory, that would be less vulnerable to interference and interdiction from our positions in Sikkim. This construction, when connected to the stretch earlier constructed in the Doklam Plateau that leads to the foothills of the Jampheri Ridge, will substantially enhance the vulnerability of the strategically vital Siliguri Corridor that connects the North East.

Our internal situation, too, has similarly become increasingly brittle. Not only has the insurgency taken a turn for the worse in the Valley, given the steep rise in militant activity, but what has really added to the uncertainty is the targeted killings of civilians, especially from minority communities. In addition, the situation in the Poonch-Rajouri sector is fluid. Ongoing operations, in which the Army has suffered substantial casualties, commenced over a month ago, and still show no signs of ending. This suggests that militants are operating in strength, which is unexpected and reminiscent of the conditions that prevailed there a couple of decades ago. We are certainly owed an explanation as to how the situation was allowed to deteriorate to this extent.

The situation in the North East appears to be no better, as the recent ambush in Manipur, that resulted in the tragic death of the Commanding Officer of an Assam Rifles Battalion, along with that of his wife and child, and of four personnel of his escort detail, clearly shows. More importantly, the peace deal being negotiated with the NSCN(IM) appears to be going nowhere. This can only add to the frustration amongst militants and is hardly conducive to ensuring stability and peace in the region, more so, if the Chinese are back to their old tricks of supporting extremists there.

Over three decades ago, Prof William Lind and his colleagues published their pathbreaking paper, *The Changing Face of War: Into the Fourth Generation*, in the *United States Marine Corps Journal*. In it, they identified the central tenets of how fourth generation warfare has evolved and how it differs from its earlier avatars. In their view, each generational change has been marked by greater dispersion on the battlefield. Thus, fourth generation warfare “include(s) the whole of the enemy’s society,” and aims at the “goal of collapsing the enemy internally rather than physically destroying him.” In essence, they viewed fourth generation warfare as undefined, with the line

between war and peace, and civilian and military blurring, if not disappearing completely. Such a war would be non-linear with no definable battlefields, and actions would occur concurrently, with society as a cultural and not just a physical entity.

It is wholly inconceivable that our bureaucrats and military leadership are not fully conversant with the linkages and ramifications of these developments. One cannot, however, say the same for our political establishment. It seems to inhabit an alternate universe in which all that matters is promoting self-serving agendas, fuelling dissension and distrust, and winning the next election on the horizon. Unfortunately, by their actions and words, both the military leadership and civilian bureaucracy appear to have forsaken their own moral and constitutional responsibilities and are busy genuflecting to the powers that be.

The quicker we accept that we are already in the middle of a war, in which our very survival as a nation is at stake, the better. In the coming battles, no quarter will be given and losing is just not an option. Instead of creating polarised vote-banks and blaming sections of society for falling prey to enemy propaganda, it is time that the disparate elements of our political establishment came together to spread awareness as to the immense dangers we face. We can only surmount the challenges only if we face them unitedly regardless of religion, caste, creed, ethnicity or gender. It also calls for breaking down the silos in which the security establishment prefers to work by reorganising and reorienting them to be able to work together seamlessly to face the challenge that the fourth generation warfare Poses.

(The writer, a military veteran, is a Visiting Fellow with the Observer Research Foundation and a Senior Visiting Fellow with The Peninsula Foundation)

<https://www.dailypioneer.com/2021/columnists/hybrid-warfare-is-the-future-of-wars.html>

With S-400 in kitty, Modi, Putin may discuss acquiring Russian S-500, S-550 Missile Systems during India visit

By Prakash Nanda

Russian President Vladimir Putin is expected to visit India next month which will not only coincide with the delivery of the first lot of S-400 surface-to-air missile (SAM) systems but also be marked with the negotiations with Indian PM Narendra Modi for the potential sale of the super-advanced S-500 and S-550 missile systems, according to reliable sources.

If talks are fruitful, then India could become the first foreign buyer of the Russian-made S-500 and S-550 SAM air defense systems.

The preparation for Putin's visit to India is on and an official announcement of the exact dates is expected any time. Russia mentioned publicly for the first time on November 9 through its Defense Minister, General Sergei Shoigu, that Moscow is also developing the S-550 air-defense missile system.

The S-500 Prometey

The S-500 Prometey (Russian for Prometheus) is already developed and it was first tested successfully in July this year. In September, the Russian Armed Forces began receiving their first S-500 consignments, according to Russian Deputy Prime Minister Yuri Borisov.

And by October, the first S-500 brigade was deployed by the Russian Aerospace Forces' 15th Special Forces Army to cover Moscow and the country's Central Industrial Region.

The S-500's operational range is approximately 370 miles (600 kilometers), within which it reportedly can detect and simultaneously counter up to 10 ballistic supersonic terminal ICBM warheads flying at speeds up to 4.34 miles (7 kilometers) per second.

Beyond providing battlefield tactical air defense, the mobile S-500 Prometheus system is considered one of the most advanced in the world, reportedly capable of destroying volleys of hypersonic missiles currently under development by various countries.

Russian analysts claim that S-500 could even target satellites in low-earth orbit and fifth-generation stealth aircraft, in addition to its primary targets of cruise and ballistic missiles. Moreover, the system's survivability is allegedly enhanced by its high resistance to electronic interference.

The S-500 was developed by the Almaz-Antey Air Defence Concern to replace aging A-135 missile systems currently in use. It is considered a step up from the S-400 Triumph but would supplement that platform rather than replace it, it is said.

The S-550 SAM

As regards the S-550 SAM, it is believed to be developed on the basis of the S-500 Prometheus. It is to become the world's first mobile specialized missile defense (anti-ballistic missile—ABM) and anti-space defense system capable of effectively destroying ICBMs.

At present, countries such as Russia and the United States possess missile-defense systems that can accurately shoot down ICBM warheads. But, these systems are not mobile and are, instead,



The S-500 SAM system.

based in silos, increasing their vulnerability to a pre-emptive first strike. The S-550 will overcome this lapse.

The Russian news agency RIA Novosti reported on November 13 that “the new [S-550] mobile system is being developed as a version of the S-500 air-defense system and will specialize in anti-missile and anti-space defense tasks. Its capabilities to intercept warheads of ballistic missiles of various ranges, primarily intercontinental ones, as well as space attack weapons will be an order of magnitude higher than that of the S-400 and S-500, as well as American missile defense systems—THAAD and Aegis with SM-3 Block II B missiles”.

Now, how India fits into these schemes of things? According to Dmitry Shugaev, the head of Russia’s Federal Service for Military-Technical Cooperation (FSMTC), India could well become the first country to which Russia may export its most advanced S-500 Prometheus air-defense weaponry, given the depth of Indo-Russian military ties.

Longstanding Defense Ties

India has been a longstanding strategic partner of Russia. New Delhi has long employed Russian-made hardware including tanks, small arms, and aircraft, ships, carrier aircraft (INS Vikramaditya), and submarines, including nuclear ones.

India also is purchasing the S-400 Triumf. India and Russia are jointly producing BrahMos supersonic missiles and negotiating on the licensed manufacture of Ka-226T helicopters.

It is true that India’s partnership with the United States is growing stronger every passing day, and is being described as “a defining partnership for the 21st century”, and India has been designated a “major defense partner” of the US on par with NATO allies. However, India also professes a great friendship and unprecedented “strategic partnership” with Russia.

It is often ignored that New Delhi has purchased a hefty \$70 billion worth of arms from Moscow since 1991. India has absorbed a third of Russian arms exports over the past decade, far exceeding China’s arms purchases from Russia.

A study says that though American arms sales to India have grown from nothing to between \$16–18 billion over 15 years, New Delhi signed \$15 billion in new arms contracts with Moscow in the span of a year between 2018 and 2019.

Though SIPRI (Stockholm International Peace Research Institute) data differs from these figures “due to accounting procedures, anchoring years, and exchange rates”, the data given in the above study suggests that while Indian arms purchases from the US grew from zero in 2005 to \$4 billion over 15 years, in that same period, cumulative Indian arms purchases from Russia grew by seven times that figure.

In fact, this study’s analysis is that Russian-origin platforms in the Indian military which comprise “85 percent of major Indian weapons systems rather than the 60 percent figure often cited”, have created a “lock-in” effect. “The depth of relative support to India’s technology base and strategic systems have engendered a relatively high degree of indebtedness and trust in key strategic circles.”

It is not that India’s procurement of arms from Russia is friction-free. There has been an issue of quality. India has encountered several problems, including substandard systems or contractual obligations not being met.

In addition, when it comes to the supply of spare parts, Indian officials have privately complained about delays, price revisions, cost overruns, and demands for advance payments or new or long-term contracts, some even designed to leverage India’s dependence on Russia.

Finally, even as Russian co-development and technology transfers are routinely heralded and are the standard by which all other arms agreements are implicitly evaluated against, India remains perennially dissatisfied with the limits of technology transfers and access.

Partnership Dates Back To Soviet Era

However, despite Indian frustrations with issues of quality, spares, and maintenance costs of Russian-origin systems, the relationship with regard to arms business between the two countries will remain foremost because of the following reasons:

First, there is the factor of history, particularly the then Soviet help to India during the Cold War not only in armaments but also in the areas of non-military industries such as space and nuclear. This has produced some reservoir of familiarity and goodwill that have reified Russia–India cooperation after the dissolution of the USSR.

Secondly, given the accumulated stock, platform familiarity by operators, training, and organization around acquisition flows, India remains reliant on Russia to keep its military functioning.

Thirdly, India still considers Russian weapons cost-efficient. Ironic it may sound, but India's diversification from other Western suppliers like Israel, France, and later the United States has increased its bargaining power vis-à-vis Russia. This is all the more so as Moscow's economic need for foreign exchange through defense exports has grown manifold.

Russia is now more open to India's demand for licensed production or joint development on some technologically advanced systems, like cruise missiles, nuclear submarines, fighter aircraft, nuclear energy, and surface ships (including an aircraft carrier).

In fact, India is unlikely to find another state as willing as Russia is to develop high-level collaboration on advanced strategic systems. This only strengthens India's resolve to continue the relationship, as it is likely to bear fruit well into the future.

Fourthly, Russian support for Indian defense technology and indigenization cannot be overlooked. Russian arms sales, information sharing, collaboration, technology transfers, and hands-on technical guidance, often in the face of heavy US pressure, have made tremendous contributions to India's strategic deterrent.

There has been unmistakable Russian help, even though not conspicuous, in the development of Indian submarine-launched, intermediate-range, and intercontinental ballistic missile capabilities through indigenous SSBN, the INS Arihant.

Dozens of Russian engineers and advisors were dispatched to support India's Department of Atomic Energy and DRDO and assist with designs, precision equipment, and reactor miniaturization technology to fit it aboard a submarine, as admitted by late Ashok Parthasarathi, former science and technology advisor to the Indian Prime Minister.

Similarly, Russian space cooperation has played its role in India's newest breakthrough strategic developments—such as enhanced intelligence, surveillance, and reconnaissance (ISR) capabilities and improved navigational satellite systems.

Fifthly, and this is very important to realize, in all this Russia has not demanded special access to basing or intelligence facilities in India. Analysts say that Moscow has also not shaped the doctrinal concepts or strategic thinking of Indian officers.

There might have been some indirect influence of the sale of certain weapons platforms on Indian war doctrines, but these are marginal. Indian doctrines are still influenced by the British legacy; in fact, these have been more receptive of late to the Western (American) doctrines.

Considering all this, India may not disappoint the Russians by becoming the first customer of S-500, or for that matter S-550.

<https://eurasianimes.com/with-s-400-in-kitty-modi-putin-may-discuss-acquiring-russian-s-500-s-550-missile-systems-during-india-visit/>

As China flies nuclear bomber near the disputed border, Indian Air Force ‘Gears-Up’ to counter the PLAAF

By Sakshi Tiwari

Amid India-China border tensions, the Chinese PLAAF recently dispatched an H-6K bomber close to the LAC, the disputed border with India. Satellite imagery accessed by the media outlets has revealed that China’s Air Force (PLAAF) has three airbases opposite eastern Ladakh – Kashgar, Hotan and Ngari Gunsua.

Other Chinese airbases on the radar of Indian agencies include Shigatse, Lhasa Gongkar, Nyingchi, and Chamdo Pangta.

The two nuclear-armed neighbors have been locked in a border standoff for almost 18 months now. PLA has scaled up the deployment of troops, artillery, and air defense systems and India has taken appropriate countermeasures.



Air Chief Marshal VR Chaudhari visited Air Force Station, Leh on October 16, 2021. (IAF photo)

Indian Air Force has been in the process of making elaborate arrangements to swiftly counter any threat posed by the Chinese Air Force including acquiring the latest weapons and keeping its fighters up and ready for operations.

In the regular “Working Mechanism for Coordination and Consultation” (WMCC) meeting aimed at boundary resolution held recently, both India and China have together paved the way for the 14th round of Commander-level talks. While the Indian statement mentions the need for “complete disengagement”, the Chinese side has been reticent and only mentions “resolution of remaining issues”.

This half-hearted posturing from the Chinese side is in consonance with its hardened position and expansionist maneuvers at the LAC.

Indian Air Force chief Air Chief Marshal VR Chaudhari, after his visit to the forward areas last month, had stated that “the situation on the Line of Actual Control is that the Chinese Air Force is still present on three air bases on their side of the LAC. We are fully deployed and prepared on our side”.

Earlier this year, satellite imagery revealed that two PLAAF stealth J-20 fighters remain stationed at the Hotan airfield in the Xinjiang region. J-20 jets are the most powerful warplanes in the PLAAF’s arsenal and could be used in strike missions against Indian defenses.

Indian Air Force at LAC

India has been bolstering its air presence along the disputed border. It has about 25 airfields close to the LAC, Air Marshal Anil Chopra (retired) wrote in a piece for FirstPost.

“IAF is very well placed with nearly 25 airfields capable of launching operations against China. China effectively has three airfields close to eastern Ladakh, and around eight in Tibet. One more is coming up in Xinjiang. They are trying to upgrade infrastructure but have the disadvantage of very high altitude. IAF will be able to launch a much larger number of missions”, Chopra explained.

Since the India-China confrontation erupted, IAF has deployed its aging but battle-proven Mirage 2000 jets at the LAC that are equipped with lethal missiles for air-to-ground and air-to-air missions.

The French manufactured Mirage 2000s had originally been procured to counter the Pakistani F-16A/B but were also used to strike ‘terror hideouts’ in Balakot in 2019. The aircraft was also used against Pakistan during the 1999 Kargil war.

Owing to its competence and excellent performance for the Indian Air Force, New Delhi recently signed a deal with Dassault Aviation to procure 24 phased-out Mirage 2000 aircraft to strengthen its aging fleet of this 4th generation fighters and for critical spare parts needed to carry out a mid-life upgrade.

Another aircraft that has made its presence felt near LAC is India’s most powerful air dominance fighter jet – the Su-30MKI. It is a twin-jet multi-role combat aircraft that could fire BrahMos supersonic cruise missiles and has exceptional dogfighting capabilities. India currently has approximately 272 Sukhoi-30MKI fighter jets.

These aircraft were first deployed at the forward bases near LAC last year alongside Rafales and Mig-29s.

After the Galwan Valley clashes, MiG-29s were dispatched to the forward bases. In July last year, ANI released videos and images of this fighter aircraft conducting night operations near the LAC in a bid to step up vigil.

Earlier this year, satellite imagery showed at least 3 MiG-29s at one of the forward bases. The actual number was expected to be higher. In the backdrop of the conflict and before the arrival of the Rafale, media reports had also hinted at the naval variant of the MiG-29 i.e. the Mig-29K’s deployment at the northern border.

India currently operates three squadrons of the MiG-29 and has bought another one to add to the existing fleet. The MiG-29 is a twin-jet combat aircraft that has been upgraded to MiG-29UPG which has superior capabilities like advanced EW suite, high thrust to air ratio, and a better navigation system, to name a few.

Apart from the existing fleet of aircraft, the Indian Air Force has also been modernizing its fleet. The delivery of the Dassault Rafales which started in 2020 will be complete by early next year.

One squadron was stationed at Ambala which could be swiftly dispatched to Ladakh and another in Hasimara, West Bengal which could be sent to the Arunachal Pradesh sector of the LAC, if needed.

Rafales supplied to IAF have been modified according to India’s needs. Some of these modifications include radio altimeter, radar warning receiver, low band jammer, flight data recorder, high-altitude engine start-up, synthetic aperture radar, ground moving target indicator and tracking, infrared search and track, helmet-mounted display, missile approach warning systems, and very high-frequency range decoys.

It is also fitted with French manufactured HAMMER air-to-ground missiles, Meteor air-to-air missiles and SCALP land-attack missiles. It could pose a formidable threat to the PLAAF with its advanced capabilities, experts have argued.

More Firepower

The IAF had also deployed Apache attack choppers and Chinook heavy-lift helicopters to transport troops to various forward locations. The IAF has a fleet of 22 AH-64E Apache helicopters, according to Boeing.

The Apache’s thrust and lift, combined digital operability, better survivability, and cognitive decision-aiding capabilities make it an elite fighting force capable of completing any mission under any conditions, according to its maker.

On the other hand, the newly procured Chinooks are heavy-lift copters with a twin-engine, tandem-rotor design. They are capable of airlifting a variety of military and non-military loads into remote locations which is why it was dispatched to the LAC.

The Indian Air Force also deployed transport aircraft like the Lockheed Martin C-130J Super Hercules and the Boeing C-17 Globemaster, as earlier reported by the EurAsian Times.

India's armed forces had earlier this year begun preparations for the stocking up of winter supplies including heavy weapons, ammunition, communication equipment, heaters, fuel, food and essential commodities which were essentially transported by the C-17 and the C-130J. India currently has 11 C-17 and 9 C-130J.

The Indian Navy's surveillance aircraft, Poseidon 8I anti-submarine warfare aircraft, had also been deployed in eastern Ladakh to carry out surveillance along the LAC. The P-8I was also used at the time of the Doklam crisis of 2017 in order to monitor the movement of Chinese troops.

The P-8I is designed to protect India's coastlines and territorial waters and is primarily used for Intelligence, Reconnaissance and Surveillance functions.

In February 2020, the Indian Chief of Defense Staff Gen. Bipin Rawat stated, "I came to know about the capabilities of the P-8I anti-submarine warfare planes after they were deployed in Doklam for surveillance." The planes are also deployed in Ladakh during the ongoing standoff with China.

A large fleet of Israeli-made Heron medium-altitude long-endurance (MALE) drones has been monitoring the LAC in the hilly terrain and relaying vital data and photographs to command and control centers.

The Heron TP drones are equipped with automatic takeoff and landing (ATOL) and satellite communication (SATCOM) systems for an extended range.

In addition to the drones, the Indian Army's aviation branch has been deploying the Weapon System Integrated (WSI) model of the Advanced Light Helicopter Rudra in the region, giving its tactical tasks in the region more teeth. Rudra is an attack helicopter manufactured for the Indian Army.

The Indian Air Force is also procuring the S-400 air defense system from Russia. The delivery of the first batches has already begun and would be complete by this year.

The S-400 Triumf is one of the world's most modern and powerful air defense systems, capable of defending against practically any type of aerial attack, including drones, missiles, rockets, and even fighter jets.

The system is a long-range surface-to-air missile system designed to operate as a shield over a certain area. It would be an asset for the Indian Armed Forces once deployed at the LAC.

Additionally, India has placed an order for the French-manufactured HAMMER missiles for its indigenously built LCA Tejas aircraft, as reported by EurAsian Times. The HAMMER, when integrated with the LCA Tejas, will allow it to hit ground targets and hardened bunkers at ranges up to 70 km.

<https://eurasianimes.com/border-indian-air-force-gears-up-to-counter-china/>

India will soon have satellite based Quantum Communications Systems - ISRO Chairman K. Sivan

K Sivan, Chairman, ISRO & Secretary, Department of Science, says the space agency is ready to embrace a new chapter in space -- to build/ launch satellites & payloads in collaboration with Indian space startups. It aims to have clusters of small satellites for precision observation. In the wide ranging conversation with BW Businessworld's Manish Kumar Jha, Sivan talks about the space draft policy, Chandrayaan 2 payloads (new findings), Gsat1, Mission Gaganyaan (unmanned), NavIC, SAR and collaboration with other leading space agencies like US space Agency NASA & Russia's Roscosmos.

By Manish Kumar Jha

Manish K. Jha: Space exploration has acquired a new dimension along the commercial spectrum. India is also treading to unlock such potential. In this regard, Department of Space is drafting revised policy frameworks and regulations. What are the focus areas that will set forth the greater aerospace industrial ecosystem in India?

K. Sivan: Basically, now that we are talking about unlocking India's potential in the space sector, not only ISRO but a lot of industries as well as startups are capable of doing space activities. These activities involve launching satellites and providing services across certain sectors. And when it comes to these sectors there are some things that we should understand.



Space activities include International Obligations for a space system. Also, the government is responsible for space activities happening in the country. So when International Obligations are there, when we allow people to do space activities, we need to have a policy framework.

So we are drafting 10 policies, for instance, Satcom policy, remote sensing policy, satellite launching policy, space exploration policy, EPDA policy. These policies will ensure that we have a good system for people to do the job without any hindrance.

Manish K. Jha: While ISRO has been involved with the world's leading and complex projects in space, in terms of commercial value, India's share of the \$447 bn space economy is only ~ 2 %. How could we unlock the potential and utilize our advancement in the space to monetize and sustain the research program of the next generation?

K. Sivan: This is mainly because the work was contained within the ISRO alone and the number of people involved in the act were very few. There is a need to understand space systems. By opening up the space sector to the industry, definitely the economy is going to benefit, our share is going to increase. So more number of people will come into the picture, more number of private players will be there and the economy will benefit. We are not constrained by lack of technology, however we have limited resources. We are not able to produce a large number of satellites.

Another factor is, if we look at the space economy, the launch vehicle or satellite contributions are very less, whereas the ground systems as well as the applications are more.

By opening up or unlocking this potential we will be able to capture the downstream activities also. And via the process we will be able to boost our economy.

Manish K. Jha: ISRO has gathered the latest data from Chandrayaan-2 orbiter payloads through scientific observations of the moon by remote sensing and in-situ techniques. What are the latest findings?

K. Sivan: There are a lot of interesting observations by the Chandrayaan orbital mission. We had the Chandrayaan mission in two parts -- the science part and the landing part. For the landing part we couldn't succeed because of failure in the system. The science part by the orbital is still on. This system has been going on for over seven years. We have gathered a huge amount of data and some of it is very interesting.



Our Chandrayaan payload is able to capture nano-solar fliers. There are some strong observations on the water molecules, a lot of new things are coming.

Manish K. Jha: ISRO had a breakthrough technological moment by testing a free space quantum communication. How will it translate into greater distance and quantum communications between satellite and ground stations?

K. Sivan: Basically, quantum communications have a major application, a major use of secure communications. Now the communication system is very open even though it's encrypted. And with advanced computers anybody can hack the system.

So we want to secure communications and quantum communication technology is going to give a major input in that direction.

In fact, we have already worked out the experiment in our space application center -- in that they were able to establish quantum communications between two buildings which are 300 metres away. Now another research is going on in the physical research laboratory that involves quantum which is much more secured. That is already re-established. Already in the Raman Research Institute we did a project, research is going on in ISRO centres as well as other labs.

All this we are going to put together and demonstrate satellite based quantum communications. Once that is done we will be establishing the satellite based communication through experimental mission and we will be able to do actual system by combining the terrestrial system with the space based satellite system. With that we will be able to have a quantum communication system that will be highly secured.

Manish K. Jha: So we are the pioneers in this area?

K. Sivan: The technology is already with China, other countries are also working on it. We are not the pioneers but we are not lagging behind in this technology.

Manish K. Jha: GISAT-1 aims to capture real-time images. How does it add to defence capabilities? Can the satellite capture and track the underwater movement or hyperspectral imaging under a dense forest or mountain?

K. Sivan: The strategic area is not a part of this, so that is defined and we are only providing the satellite. All other things they are handling. So it's not a part of ISRO. That's all.

Manish K. Jha: What is the latest update on NavIC (Navigation with Indian Constellation) which is the independent standalone navigation satellite system of India? Does NavIC have the required constellation of satellites and ground stations to achieve the scale and effectiveness in terms of position, navigation, and timing?

K. Sivan: We have seven satellite constellations for NavIC and this gives very accurate results. The clocks were imported and some failures were there in the clocks. So to overcome the failures in the clocks we have indigenously developed the atomic clocks in our system.

Our space applications have developed the atomic clocks and we got very good results. In the near future we will be launching our navigation satellite with our indigenous atomic clocks, thus the satellite navigation constellation will give accurate results.

Manish K Jha: Within two years in all likelihood?

K. Sivan: Yes, that is already in place. We will augment this. Satellites have a lifetime. So we wanted to replace the satellites. So this system is going to be a continuous process. We are going to include the advancement in the atomic clocks also.

Manish K. Jha: Due to the COVID-19 induced logistics issue, the first uncrewed mission of Gaganyaan is extended. What is the development stage now? What are the elements of collaboration with DRDO on the mission?

K. Sivan: The Gaganyaan mission is not an ISRO mission alone, it is a national mission because there are a lot of collaborations required with the different laboratories of DRDO. It is the first requirement. That way we are interacting with the DRDO labs to get the required systems. Also, these systems require international collaborations. We are interacting with Russia, France, Japan and the US for some of the subsystems. Because of COVID there is some delay but I am sure that we will be having an uncrewed mission.

We need to have two uncrewed missions before a real mission. We are planning the first mission next year to validate some of the technologies. So in case there is any deficiency in the technology, which we will be able to gauge only through flight, the information can be utilized to enhance the technical robustness.

So for the next mission we will ensure that everything is organized, then only we will go for the manned mission.

Manish K. Jha: So when do you think, we will be having a manned mission? And how many crew will be there?

K. Sivan: It is too early to tell right now. We want to see the first uncrewed mission results. We are waiting for that, then only we can talk about the next part.

(ISRO has successfully conducted the third long duration hot test of the liquid propellant Vikas Engine for the core L110 liquid stage of the human rated GSLV MkIII vehicle, as part of the engine qualification requirements for the Gaganyaan Programme. The engine was fired for a duration of 240 seconds at the engine test facility of ISRO Propulsion Complex (IPRC), in Tamil Nadu.)

Manish K. Jha: There are multiple organizations to explore the commercial viability of space related activities: New Space India Limited (NSIL), Antrix Corporation, Indian Space Promotion and Authorization Centre (INSPACE). How all these will translate into value creation in the space sector?

K. Sivan: We are bringing private players to do the space activity, we wanted to have a mechanism for authorization and regulation. Also, we are using the New Space India Limited (NSIL) for all the commercial missions. Earlier all the missions of ISRO, whether commercial or scientific or technical, were done by ISRO only. Now commercial missions are transferred to NSIL so that ISRO can concentrate mostly on technology development, capacity building, infrastructure building so that the load will be reduced. So it's not changing anything, it's only expansion of the space activities.

Manish K. Jha: What could be the potential opportunity for young startups in India?

K. Sivan: I think the startups are doing extremely well. They are involved in rockets, space crafts, space situational awareness and many other areas. Going by the interactions I have had with them, they are extremely bright and I am sure they will come up with innovative solutions.

These solutions are going to be cost-effective and I have a feeling that we are going to capture the global market too.

Manish K. Jha: What could be the potential opportunity for satellite manufacturing/technology, data communications, synthetic aperture radar (SAR) and payload related activities for the private sector Indian space entities?

K. Sivan: There are a lot of opportunities available. By opening up the payload, ISRO may not take up the payload there. What I am saying is that they can produce and launch a satellite and provide the service. So the small entrepreneurs are involved in making advanced satellites with an innovative payload. It will be a very good thing and if they are launching, they can have the constellation or different types of satellites. It will be beneficial for the common people as well as for them.

Manish K. Jha: What does it take to create such a center of excellence that others don't have?

K. Sivan: Definitely, the way we are expanding the space activities, unlocking India's potential in the space sector by doing this way and by bringing the change. I am sure we will succeed in other areas.

<http://www.businessworld.in/article/India-Will-Soon-Have-Satellite-Based-Quantum-Communications-Systems-ISRO-Chairman-K-Sivan-/21-11-2021-412474/>

New tracking method in high-powered jet engines paves the way for optimal combustion

Have you ever experimented with food dye? It can make cooking a lot more fun, and provides a great example of how two fluids can mix together well—or not much at all.

Add a small droplet in water and you might see it slowly dissolve in the larger liquid. Add a few more drops and perhaps you'll see a wave of color spread, the colored droplets spreading and breaking apart to diffuse more thoroughly. Add a spoon and begin stirring quickly, and you'll probably find that the water fully changes color, as desired.

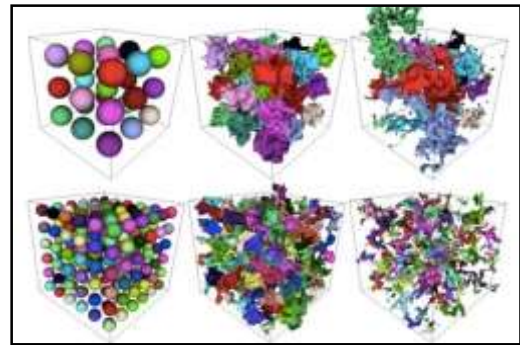
Researchers at the USC Viterbi School of Engineering, led by Ivan Bermejo-Moreno, assistant professor of aerospace and mechanical engineering, studied a similar phenomenon with gases at high speeds, with an eye toward more efficient mixing to support supersonic scramjet engines. In the study, published in *Physics of Fluids*, USC Viterbi Ph.D. Jonas Buchmeier, along with Xiangyu Gao (USC Viterbi Ph.D. '20) and former visiting M.Sc. student Alexander Bußmann (Technical University Munich), developed a novel tracking method that zoomed in on the fundamentals of how mixing happens. The study helps understand, for example, how injected fuel interacts with the surrounding oxidizers (air) in the engine to make it operate optimally, or how interstellar gases mix after a supernova explosion to form new stars. The method focuses on the geometric and physical properties of the turbulent swirling motions of gases and how they change shape over time as they mix.

Scramjet engines—super-fast, experimental engines with no moving parts—have previously set the air speed record for jet aircraft at Mach 9.6, allowing potential travel from Sydney to London in around 90 minutes.

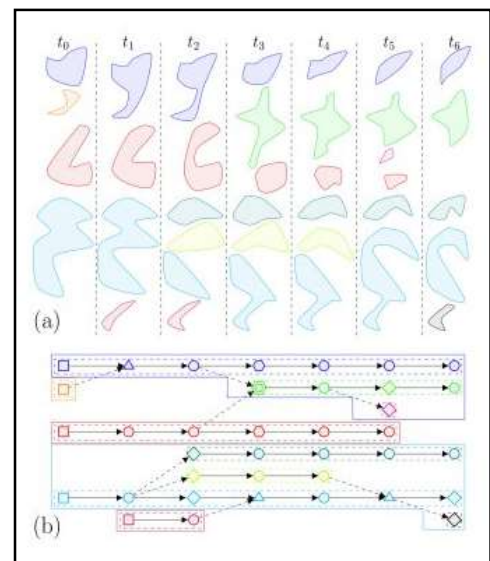
"The dynamics of these individual flow structures and the geometric changes they are undergoing have not been tracked over time," Bermejo-Moreno said, "because we didn't previously have the computational techniques to do so; particularly in a turbulent, propulsion system (like in a jet engine). Now we can look at thousands or hundreds of thousands of these flow structures simultaneously and track for each how the shape of the structure changes and how it mixes and interacts with the surrounding structures."

The value, Bermejo-Moreno said, is that once you can identify patterns that are most helpful to accelerating the mixing process, you can replicate these specific conditions, since you can see the evolution of the structures (of the fuel and oxidizer, for example) at every point in time.

"In a supersonic combustion engine, you want fuel mixing to occur as quickly as possible so that the fuel will be completely used before exiting the engine," he said. "To do this, we need to understand how mixing occurs at different points in time."



Evolution of structures at different points in time, from left to right. Changes in shape and color are associated with merge and split events. Credit: Ivan Bermejo-Moreno



The structure changes shape over time and corresponding mergers and splits occur as the fluid interacts with turbulence. Credit: Ivan Bermejo-Moreno

Shapeshifting and shockwaves

When fuel is injected into a rocket or scramjet engine, it begins a diffusion process, Bermejo-Moreno said.

"The injection process is going to typically break the fuel up into small, nearly spherical structures, which are then transported and mixed by the turbulent airflow inside the engine. The turbulence will continue breaking up the fuel structures and changing their shapes."

The figure above demonstrates an "ideal" case, where the fuel is far away from the engine walls, and essentially there are no boundaries. But in a real-life scenario, the engine walls will also impact mixing. The new study focuses on isolating the effects of shockwaves as a key component in compressing the fuel—constricting its volume—and breaking it up, Bermejo-Moreno said. A shockwave is a disturbance that moves faster than the speed of sound, and makes an abrupt, discontinuous change in pressure, temperature and density of the medium its impacting. In this case, a shockwave flattens the shape of the fuel structures and creates more surface area for the fuel to be broken up by the turbulence inside the engine.

Understanding the effects of compression—via a shockwave, for example—on turbulent mixing processes is very important to advancing air-breathing super and hypersonic propulsion systems.

These systems are characterized by an inflow of air forced into the engine, heated and released through an exhaust. Such systems also have compressed time requirements for mixing to occur. Knowing exactly how injected fuel is broken down can help researchers identify exactly which conditions promote the most beneficial mixing scenario for such engines to efficiently operate.

Prior research led by Bermejo-Moreno identified shockwaves as a beneficial force in accelerating fuel mixing, but that research did not benefit from the tracking methodology algorithm put into place in the new study. While several events could be tracked manually, trying to find an accurate representation and recommendation of how fuel will mix in different conditions relies on having a large enough sample size showing a similar result.

This new tracking methodology offers a clearer picture of the structural shift of the injected fuel from moment to moment, better informing aerospace engineers how to replicate conditions that will most benefit supersonic and hypersonic engines.

"Once you have this tracking algorithm, you can apply it to any flow to obtain a graph that encapsulates the interactions of all the structures found in the flow over time," Bermejo-Moreno said. "You can interrogate the graph and look for patterns that evolve similarly over time. You can see how often these patterns repeat and collect statistics of the physical processes involved to say, for instance, "This is a common behavior in the breakup process of the injected fuel."

Bermejo-Moreno said that the impact of a shockwave is especially significant in cases with larger spherical structures rather than the smaller spherical structures, as the larger spheres are more susceptible to "splitting events" where the fuel breaks into more and more pieces.

"If you think about larger structures," he said, "You think they will take longer to diffuse, but the turbulent mixing they experience will benefit more from shock interactions, which will break them more quickly into smaller structures."

If you think about the case of the food dye again, the more small drops of food dye there are, the easier it is for the dye to dissolve in water and combine with it to make a new solution.

"If you can have better mixing, that's going to help improve the performance of your propulsion systems," Bermejo-Moreno said.

Informing future recommendations

Bermejo-Moreno said next steps include investigating what happens when you get closer to the engine walls and in mixing layers—two streams of fluid moving at two different speeds. "We will track structures of turbulence over time to understand how viscous shear affects the mixing processes from the standpoint of the structural dynamics," he said.

For now, Bermejo-Moreno said there are additional factors that will ultimately impact propulsion performance that will be taken into account before providing real world recommendations, but this is one step forward.

More information: Jonas Buchmeier et al, Geometry and dynamics of passive scalar structures in compressible turbulent mixing, *Physics of Fluids* (2021). [DOI: 10.1063/5.0068010](https://doi.org/10.1063/5.0068010)

Journal information: *Physics of Fluids*
<https://phys.org/news/2021-11-tracking-method-high-powered-jet-paves.html>



Sat, 20 Nov 2021

By keeping ferroelectric 'bubbles' intact, researchers pave way for new devices

By Jared Sagof

When a magician suddenly pulls a tablecloth off a table laden with plates and glasses, there is a moment of suspense as the audience wonders if the stage will soon be littered with broken glass. Until now, an analogous dilemma had faced scientists working with special electrical bubbles to create the next generation of flexible microelectronic and energy storage devices.

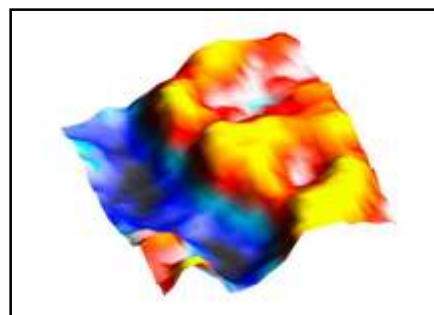
Scientists at the U.S. Department of Energy's (DOE) Argonne National Laboratory have discovered a new way to do an atomic-scale version of the tablecloth trick by peeling off heterostructure thin films containing electrical bubbles from a particular underlying material, or substrate, while keeping them fully intact. The discovery may bring us one step closer to a host of applications that rely upon these unusual and brittle structures.

"You can think of it like trying to remove a house from its foundation. Normally, you would think that the house would collapse, but we found that it retained all of its properties," said Saidur Bakaul, Argonne materials scientist

"The bubbles are very fragile and initially need particular underlying materials, called substrates, and specific conditions in order to grow films with them in," said Argonne materials scientist Saidur Bakaul. "There are many materials of interest to us for which these bubbles could be extremely useful, like plastics. However, we haven't been able to grow them directly on these materials. Our research is the initial step to make bubbles possible there."

The electric bubbles are found in a three-layer ultrathin structure with alternating electrical properties: ferroelectric, then dielectric, then ferroelectric again. The bubbles in this multilayer structure are made out of specially ordered dipoles, or twinned electric charges. The orientation of these dipoles is based on the local strain in the material and charges on the surface which cause the dipoles to seek out their relative lowest energy state. Eventually, the electric bubbles (bubble domains) form but only when certain conditions are met. They are also easily distorted by even small forces.

In the experiment, Bakaul's colleagues at University of New South Wales first grew the bubbles in an ultrathin heterostructure film on a strontium titanate substrate—one of the easiest materials on which to create them. Then, Bakaul faced the challenge of removing the heterostructure from the substrate while retaining the bubbles. "You can think of it like trying to remove a house from



Observation of freestanding ferroelectric bubble domains by high-resolution piezoresponse force microscopy: The two blue-white spots (4 nm radius) at the right side of the image indicate bubbles. Credit: Argonne National Laboratory.

its foundation," he said. "Normally, you would think that the house would collapse, but we found that it retained all of its properties."

Bubble domains are tiny. They're only about 4 nanometers in radius—just as wide as a human DNA strand. Therefore, they are difficult to see. In Argonne's Materials Science division, advanced scanning probe microscopy techniques with Fourier transform analysis allow scientists to not only see them but also quantify their properties in the freestanding films.

To establish that the bubble domains remained intact, Bakaul measured their electronic (capacitance) and piezoelectric properties through two microscopy techniques: scanning microwave impedance microscopy and piezoresponse force microscopy. If the bubbles had disintegrated, the capacitance would have changed under an applied voltage, but Bakaul saw that it stayed relatively stable up to a fairly high voltage.

These experiments validated numerical estimations of capacitance obtained from theoretical analyses that Bakaul and his student developed by combining atomistic simulations with circuit theory. "The combination of experiment and simulation proved conclusively that these bubbles are capable of living even when removed from the original substrate. That was something we had hoped to achieve for a long time," Bakaul said.

When the bubbles were removed, the heterostructure film—which previously lay flat like a tablecloth—suddenly assumed a rippled appearance. While Bakaul noted that many might assume this change would impair the bubbles' properties, he found that the bubbles were actually protected by a change in the materials' built-in voltage. Atomistic simulations done by Bakaul's colleagues at the University of Arkansas suggested that the elastic energy at the free interfaces is the origin of the ripple formation.

The result is exciting, according to Bakaul, because these bubbles have unusual and intriguing electrical and mechanical properties. "Ferroelectric bubbles are newly discovered nanoscale objects," he said. "There is a consensus in the community that they may have a lot of applications. For instance, transformation of these bubbles results in an unusually high electromechanical response, which can have applications in a wide range of devices in microelectronics and energy applications."

Although it's physics and not magic that has created a potential new avenue for the integration of these bubbles, Bakaul indicated that new technologies based on them could have a transformative impact. "Whether we're discussing energy harvesters or supercomputers, these bubbles could make a big difference for many different materials and applications," he said.

A paper based on the research was published in the September 19 issue of *Advanced Materials*.

More information: Saidur R. Bakaul et al, Freestanding Ferroelectric Bubble Domains, *Advanced Materials* (2021). DOI: [10.1002/adma.202105432](https://doi.org/10.1002/adma.202105432)

Journal information: [Advanced Materials](https://phys.org/news/2021-11-ferroelectric-intact-pave-devices.html)
<https://phys.org/news/2021-11-ferroelectric-intact-pave-devices.html>

Modeling quantum spin liquids using machine learning

The properties of a complex and exotic state of a quantum material can be predicted using a machine learning method created by a RIKEN researcher and a collaborator. This advance could aid the development of future quantum computers.

We have all faced the agonizing challenge of choosing between two equally good (or bad) options. This frustration is also felt by fundamental particles when they feel two competing forces in a special type of quantum system.

In some magnets, particle spins—visualized as the axis about which a particle rotates—are all forced to align, whereas in others they must alternate in direction. But in a small number of materials, these tendencies to align or counter-align compete, leading to so-called frustrated magnetism. This frustration means that the spin fluctuates between directions, even at absolute zero temperature where one would expect stability. This creates an exotic state of matter known as a quantum spin liquid.

"This intriguing and unusual 'liquid' state of quantum spins is expected to have unique quantum entanglement properties that differ from those of an ordinary 'solid'-state system," explains Yusuke Nomura of the RIKEN Center for Emergent Matter Science. "And these entanglement properties are potentially useful for quantum computations in quantum computers."

However, modeling a quantum spin liquid is highly challenging because the number of interdependent spin configurations that make up its quantum state increases exponentially with the number of particles.

Now, Nomura and a collaborator have overcome this problem by developing a machine learning method that can model quantum many-body systems. It can reveal the existence of a quantum spin liquid phase in a frustrated magnet in which the next nearest neighbor spins interact within a specific range of strengths relative to those between nearest neighbor spins.

"Our newly developed machine learning method has overcome the difficulty associated with these complex systems," says Nomura. "It has established the existence of a quantum spin liquid in a two-dimensional spin system."

The study provides a useful guideline for realizing quantum spin liquid phases in real materials. But there is a broader message: the research highlights the power of machine learning as a tool for solving grand challenges in physics. "Using machine learning as a novel tool, we have resolved a long-standing problem in physics that was difficult to solve with the unaided human brain," says Nomura. "In the future, the use of 'machine brains' in addition to human brains will shed new light on other unsolved problems. It marks the beginning of a new era of research in physics."

More information: Yusuke Nomura et al, Dirac-Type Nodal Spin Liquid Revealed by Refined Quantum Many-Body Solver Using Neural-Network Wave Function, Correlation Ratio, and Level Spectroscopy, *Physical Review X* (2021). DOI: [10.1103/PhysRevX.11.031034](https://doi.org/10.1103/PhysRevX.11.031034)

Journal information: [Physical Review X](https://phys.org/news/2021-11-quantum-liquids-machine.html)

<https://phys.org/news/2021-11-quantum-liquids-machine.html>

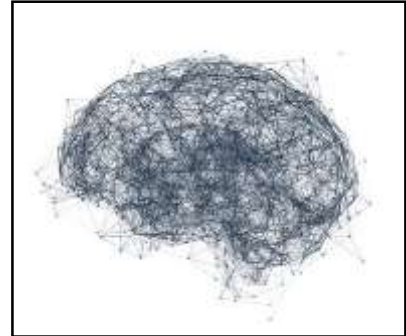


Figure 1: By using a machine learning algorithm that mimics the network of neurons in the brain, a RIKEN physicist and a collaborator have developed a method for modeling quantum spin liquid states. Credit: Jesper Klausen / Science Photo Library

Covishield, Covaxin: findings of a large efficacy study

The overall effectiveness against severe Covid was 80 per cent with two doses of Covishield, and 69 per cent with two doses of Covaxin

By Anuradha Mascarenhas

Pune: Results from a large study, which includes the Indian Council of Medical Research (ICMR), indicate that both Covishield and Covaxin significantly reduce the risk of severe Covid-19 and against the Delta variant among Indians aged 45 years and above. The study, pending peer review, was published on a preprint recently.

The findings

The overall effectiveness against severe Covid was 80 per cent with two doses of Covishield, and 69 per cent with two doses of Covaxin.

Vaccine effectiveness was highest with a 6-8 week interval between two doses of both vaccines. However, according to senior author Dr Manoj Murhekar, Director of ICMR-NIE (National Institute of Epidemiology), there were not enough numbers to gauge a 12-week interval. "The main point here is vaccines are effective. We do not really need a booster immediately as by June this year at least 60 per cent of the country's population was infected with SARS-CoV2 and vaccination would have served as a boost to the immune system," he said.

Another senior author, Dr Pragya Yadav, from ICMR-National Institute of Virology, said Covaxin and Covishield were effective against severe Covid-19 during the dominance of Delta variant in the second wave. Main author Tarun Bhatnagar from ICMR-NIE, Chennai, said an escalation of the two-dose coverage with vaccines is critical to control the pandemic in the country.

The study

The study was conducted between May and July 2021 in 11 hospitals. Of 1,073 cases of severe Covid and 2,264 controls (Covid-negative individuals), 6 per cent cases and 17 per cent controls reported full vaccination, and 16 per cent cases and 28 per cent controls reported partial vaccination with Covishield. The effectiveness of full vaccination was 80 per cent.

Of 887 cases and 1,384 controls, 3.4 per cent cases and 5.3 per cent controls reported full vaccination and 16 per cent cases and 28.3 per cent controls reported partial vaccination with Covaxin. The effectiveness of full vaccination was 69 per cent.

The study was conducted along with researchers from Amrita Institute of Medical Sciences, Kochi; Hamdard Institute of Medical Sciences and Research, New Delhi; AIIMS-Jodhpur, JSS Medical College, Mysuru; Government Medical College, Nagpur; SRM Medical College, Chennai; JIPMER-Puducherry; Surat Municipal Institute of Medical Education and Research, AIIMS-New Delhi, Rishikesh, and Bhubaneswar; and ICMR-National Institute of Virology, Pune.

<https://indianexpress.com/article/explained/covishield-covaxin-findings-large-efficacy-study-7634573/>



People receive vaccines for Covid-19 at a vaccination drive in Agartala. (Express Photo/File)

