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# समाचार पत्रों से चयित अंश Newspapers Clippings

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

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## CONTENTS

S. No.	TITLE		Page No.
<b>DRDO News</b>			<b>1-5</b>
<b>DRDO Technology News</b>			<b>1-5</b>
1.	रक्षा क्षेत्र का पहला संस्थान होगा डीटीटीसी, विद्यार्थी बनाएंगे रक्षा उत्पाद, डीआरडीओ करेगा मदद	<i>Amar Ujala</i>	1
2.	छोटी, हल्की लेकिन ज्यादा मारक होगी 'लखनवी ब्रह्मोस', अब तेजस जैसे छोटे एयरक्राफ्ट भी तीन मिसाइलें लेकर उड़ सकेंगे	<i>Navbharat Times</i>	2
3.	Manufacturing centre for Brahmos-NG supersonic cruise missile to come up in Lucknow as part of Uttar Pradesh Defence Industrial Corridor	<i>Frontline</i>	3
4.	DRDO appoints Paras Defence and Space Technologies for border surveillance tech	<i>Business Standard</i>	4
<b>Defence News</b>			<b>5-12</b>
<b>Defence Strategic: National/International</b>			<b>5-12</b>
5.	Exclusive: Defence Procurement Board's big meeting on indigenous weaponry on 5-6 January	<i>Timesnownews.com</i>	5
6.	Air Chief Marshal begins 4-day visit to Republic of Korea	<i>India Today</i>	6
7.	Rear Admiral Sameer Saxena takes charge as Fleet Commander of Navy's Western Fleet	<i>Republicbworld.com</i>	6
8.	Touted as 'Game-Changer', what are Indian Navy's 'Anti-Submarine Warfare Shallow Water Crafts'?	<i>The Eurasian Times</i>	7
9.	ट्रायल सफल रहा: बीएसपी की स्पेशल प्लेट से बनेंगी पनडुब्बियां, अब तक इसके लिए विदेशी प्लेट का होता था इस्तेमाल	<i>Dainik Bhaskar</i>	9
10.	India, Russia discuss joint defence production in Central Asia	<i>The EconomicTimes</i>	10
11.	Myanmar inducts used Chinese submarine, year after getting Indian vessel	<i>The Week</i>	11
<b>Science &amp; Technology News</b>			<b>12-14</b>
12.	From Gaganyaan to Chandrayaan-3 space missions, India aims to fly high in 2022	<i>India Today</i>	12
13.	Researchers construct a framework to solve bound and scattering state problems in quantum mechanics education	<i>Phys.org</i>	13

# अमरउजाला

Tue, 28 Dec 2021

## रक्षा क्षेत्र का पहला संस्थान होगा डीटीटीसी, विद्यार्थी बनाएंगे रक्षा उत्पाद, डीआरडीओ करेगा मदद

By नीरज 'अम्बुज'

रक्षा उत्पादों के निर्माण व अनुसंधान में स्टूडेंट्स भी अहम भूमिका निभाएंगे। डीआरडीओ उनका स्किल डेवलपमेंट करेगा। साथ ही रक्षा उपकरण बनाने की ट्रेनिंग भी देगा।

इसके लिए रक्षा क्षेत्र का देश का पहला डिफेंस टेक्नोलॉजी एंड टेस्ट सेंटर (डीटीटीसी) डीआरडीओ बनाने जा रहा है। इसे लेकर बैठकों का दौर शुरू हो गया है।

गत रविवार को अमौसी में आयोजित समारोह में रक्षामंत्री राजनाथ सिंह ने देश के इस पहले केंद्र का शिलान्यास किया। इसके अतिरिक्त ब्रह्मोस मिसाइल की निर्माण इकाई भी लखनऊ में बनाई जाएगी।



डिफेंस टेक्नोलॉजी एंड टेस्ट सेंटर बनने से विद्यार्थियों को मिलेगा फायदा। (फोटो : प्रतीकात्मक) - फोटो : ??? ???

इन दो शिलान्यासों से लखनऊ का कायाकल्प होना तय माना जा रहा है। डीआरडीओ से जुड़े विशेषज्ञ बताते हैं कि डीटीटीसी अमौसी में 22 एकड़ में बनाया जाएगा।

यह अपनी तरह का पहला केंद्र होगा, जहां नए स्टार्टअप, एमएसएमई व व्यक्तिगत या संस्थान के स्तर पर अनुसंधान कर रहे विद्यार्थियों को रक्षा उत्पादों के निर्माण की ओर प्रोत्साहित किया जाएगा।

डीटीटीसी अति सूक्ष्म, लघु व मध्यम उद्योगों (एमएसएमई) को सहायता मुहैया कराएगा। इसके तहत उन्हें रक्षा क्षेत्र के उपकरणों की डिजाइन, टेस्टिंग, मूल्यांकन में डीआरडीओ मदद करेगा।

साथ ही उन्हें तकनीकी के स्तर पर महत्वपूर्ण सॉफ्टवेयर उपलब्ध कराएगा। अभी तक ये सॉफ्टवेयर सिर्फ रक्षा क्षेत्र की सरकारी एजेंसियों के पास ही रहता है।

पर, इस केंद्र के जरिये निजी क्षेत्र के लोगों को भी इन्हें उपलब्ध कराया जाएगा। इसके अलावा निर्माण स्तर पर पहुंचने के बाद थ्री डी प्रिंटर की सुविधा भी दी जाएगी।

इसके अंतर्गत एक प्रोजेक्ट तैयार किया गया है, इसमें विद्यार्थियों को रक्षा क्षेत्र में अनुसंधान के लिए प्रोत्साहित किया जाएगा। उनका पहले कौशल विकास किया जाएगा, फिर डिफेंस मैनुफैक्चरिंग की सुविधा भी उपलब्ध कराई जाएगी।

इसे आसान भाषा में ऐसे समझ सकते हैं कि यदि अनुसंधान कर रहे किसी स्टूडेंट ने रक्षा क्षेत्र का कोई उपकरण बनाया तो उसकी डिजाइन की टेस्टिंग से लेकर सरकार को अप्रोच कैसे करना है और फिर उसके मूल्यांकन तथा निर्माण तक में डीआरडीओ का यह केंद्र मदद करेगा।

## डीआरडीओ की 60 प्रयोगशालाएं करेंगी मदद

प्रोपेलेंट, एनर्जी, फायर, पैराशूट, एवियोनिक्स आदि के क्षेत्र में अनुसंधान के लिए डीआरडीओ की देश में मौजूद 60 प्रयोगशालाएं भी अनुसंधान व निर्माण में मदद करेंगी। इससे रक्षा उत्पादन में निजी क्षेत्र की भूमिका को तेजी से बढ़ाया जा सकेगा। साथ ही विद्यार्थियों को भी प्रोत्साहित किया जा सकेगा।

## डीआरडीओ की ये प्रयोगशालाएं देंगी सहयोग

एडवांस सेंटर फॉर एनर्जेटिक मैटेरियल, एडवांस न्यूमेरिकल रिसर्च एंड एनेलिसिस ग्रुप, एडवांस सिस्टम लैब, सेंटर फॉर एयर बोर्न सिस्टम, सेंटर फॉर आर्टिफिशियल इंटेलिजेंस एंड रोबोटिक्स, ऐरोनाटिकल डेवलपमेंट एस्टिबलिशमेंट, सेंटर फॉर पर्सनल मैनेजमेंट ट्रेनिंग, डिफेंस एवियोनिक्स रिसर्च इस्टेबलिशमेंट, डिफेंस लैबोरेटी, गैर टर्बाइन रिसर्च इस्टेबलिशमेंट सहित साठ प्रयोगशालाएं अनुसंधान व निर्माण में मदद करेंगी।

इन छह सेक्टरों में काम करेगा डीटीटीसी

- कौशल विकास केंद्र
- डीप टेक इनोवेशन एंड स्टार्टअप इनक्यूबेशन सेंटर
- डिजाइन एंड सिमुलेशन केंद्र
- जांच व मूल्यांकन केंद्र
- उद्योग केंद्र 4.0/डिजिटल मैनुफैक्चरिंग
- व्यापार विकास केंद्र

<https://www.amarujala.com/lucknow/drdo-are-going-to-make-dttc-in-lucknow-lucknow-news-lko610844043>

# नवभारत टाइम्स

Tue, 28 Dec 2021

## छोटी, हल्की लेकिन ज्यादा मारक होगी 'लखनवी ब्रह्मोस', अब तेजस

### जैसे छोटे एयरक्राफ्ट भी तीन मिसाइलें लेकर उड़ सकेंगे

डीआरडीओ के सिस्टम मैनेजर रोहित सिंह के मुताबिक ये मिसाइलें वजन के लिहाज से ज्यादा हल्की और आकार में छोटी होंगी लेकिन मारक क्षमता ज्यादा होगी। तेजस जैसे छोटे एयरक्राफ्ट भी तीन ब्रह्मोस

मिसाइलें लेकर उड़ सकेंगे

Edited by मिथिलेश धर दुबे

### हाइलाइट्स

- अमौसी में ब्रह्मोस मिसाइल निर्माण केंद्र और डीआरडीओ लैब का शिलान्यास
- तेजस जैसे छोटे एयरक्राफ्ट भी तीन ब्रह्मोस मिसाइलें लेकर उड़ सकेंगे

लखनऊ: राजधानी में बन रहे ब्रह्मोस निर्माण केंद्र से नई जनरेशन की ब्रह्मोस मिसाइलों का निर्माण होगा। डीआरडीओ के सिस्टम मैनेजर रोहित सिंह के मुताबिक ये मिसाइलें वजन के लिहाज से ज्यादा हल्की और आकार में छोटी होंगी लेकिन मारक क्षमता ज्यादा होगी। इसके चलते तेजस जैसे छोटे एयरक्राफ्ट भी तीन ब्रह्मोस मिसाइलें लेकर उड़ सकेंगे, जबकि पुरानी मिसाइलें एक एयरक्राफ्ट में केवल एक ही लग पाती हैं।

सरोजनीनगर के अमौसी में ब्रह्मोस मिसाइल निर्माण केंद्र और डीआरडीओ लैब का रक्षा मंत्री राजनाथ सिंह ने शिलान्यास हुआ। इस दौरान आयुध प्रदर्शनी भी लगी, जिसमें ब्रह्मोस मिसाइल के साथ

अत्याधुनिक पैराशूट, बुलेटप्रूफ जैकेट, एंटीमाइन इन्फेंट्री बूट, कार्बाइन, ग्लेशियर क्लोदिंग, सिंथेटिक लाइफ जैकेट, गगन यान, नेवल बम, रेडोम और ब्रेक पैराशूट जैसे युद्धक साजो सामान का प्रदर्शन हुआ।

### पांच साल तक ग्लेशियर में कारगर रहेंगे कपड़े और टेंट

डीआरडीओ की ऑर्डिनेंस फैक्ट्री से जुड़े डॉ विश्व रंजन दास के मुताबिक, ग्लेशियर क्लोदिंग में उल्लेखनीय काम हुआ है। ग्लेशियर में करीब 20 हजार फुट तक जो कपड़े और टेंट ढाई साल तक ही काम करते थे, वो अब पांच साल तक काम कर सकेंगे। ग्लेशियर पर अल्ट्रा वायलेट किरणों से काफी नुकसान होता है, लेकिन नए तरह के कपड़ों पर इसका असर काफी कम होगा। यही नहीं डीआरडीओ ने ऐसा थर्मस भी बनाया है जिसमें माइनस 40 से 50 डिग्री सेल्सियस पर भी पानी नहीं जमेगा। डॉ विश्वरंजन दास ने प्रदर्शनी में लगे सिंथेटिक लाइफ जैकेट की खासियत बताते हुए दावा किया कि इस जैकेट को पहनने वाला 90 किलो तक का आदमी डूबेगा नहीं।



भारत का 'ब्रह्मास्त्र' है ब्रह्मोस मिसाइल

### वर्ष 2023 में अंतरिक्ष अभियान को तैयार गगन यान

आयुध प्रदर्शनी में गगन यान का भी प्रदर्शन किया गया। विशेषज्ञों के मुताबिक वर्ष 2023 में अंतरिक्ष अभियान होना है। उसमें अंतरिक्ष यात्री जिस कैप्सूल में बैठकर उतरेगा, उसे समुद्र में सुरक्षित गिराया जाएगा। इसका एक ट्रायल वर्ष 2014 में हो चुका है, हालांकि उस दौरान यान में कोई अंतरिक्ष यात्री नहीं था। अगले अभियान में अंतरिक्ष यात्री भी यान में होगा। प्रदर्शनी में दिखाए जा रहे नेवल बम का निर्माण भी डीआरडीओ की यूनिट कर रही है। यह बम हवा से समुद्र में गिराया जाता है और उसके बाद यह अपने आप अपने टारगेट को खोजकर नष्ट कर देता है।

### मौसम के दुष्प्रभाव से बचाता है रेडोम

रेडार, टैंक, बम बारूद और अन्य आयुध साजो सामान पर अत्यधिक ठंड, गर्मी और बरसात का कोई असर न हो इसके लिए रेडोम काफी उपयोगी होता है। युद्धग्रस्त स्थान से दूरी पर इग्लू आकर के इस अस्थायी ढांचे में सारे आयुध उपकरण और हथियार रखे जाते हैं। वहीं, एमआईजी 29 और एमआईजी 21 विमानों के साथ तेजस और सू 30 एयरक्राफ्ट में इस्तेमाल होने वाले ब्रेक पैराशूट का भी प्रदर्शन हुआ।

<https://navbharattimes.indiatimes.com/metro/lucknow/lucknow-brahmos-missile-will-be-smaller-lighter-but-more-lethal/articleshow/88515509.cms>



Tue, 28 Dec 2021

## Manufacturing centre for Brahmos-NG supersonic cruise missile to come up in Lucknow as part of Uttar Pradesh Defence Industrial Corridor

*The Brahmos-NG is smaller, lighter and has smarter dimensions and is being designed for deployment on a wider number of modern military platforms.*

*By Ravi Sharma*

The Defence Research and Development Organisation (DRDO) is establishing a BrahMos manufacturing centre in Lucknow, the capital of Uttar Pradesh. The facility, on 200 acres, will manufacture the new Brahmos-NG (Next Generation) variant of the medium-range ramjet

supersonic cruise missile that can be launched from submarine, ship, aircraft or land. It will be ready over the next two to three years and is expected to commence production at a rate of 80-100 Brahmos-NG missiles a year.

The manufacturing centre, announced by BrahMos Aerospace, will be a modern, state-of-art facility in the Lucknow node of the Uttar Pradesh Defence Industrial Corridor. The foundation stone for the centre, along with that for the Defence Technology and Test Centre (DTTC), was laid by Defence Minister Rajnath Singh on December 26.



The Brahmos-NG is smaller, lighter and has smarter dimensions and is being designed for deployment on a wider number of modern military platforms. It will hugely bolster the Indian military's modern combat capability and flexibility during the next few years.

Commenting on the DTTC, a spokesperson for the Defence Ministry stated: "The first-of-its-kind Defence Technologies and Test Centre, spread over approximately 22 acres is being set up to accelerate the growth of the defence and aerospace manufacturing clusters in Uttar Pradesh Defence Industrial Corridor. It will consist of six sub-centres — Deep-Tech Innovation and Start up Incubation Centre, Design and Simulation Centre, Testing and Evaluation Centre, Centre for Industry 4.0/Digital Manufacturing, Skill Development Centre and a Business Development Centre."

The DTTC will follow the design-build-test-learn cycle for technology consultancy and hand-holding of deep-tech start-ups and industries. Explained the spokesperson: "The DTTC will facilitate industries through establishing a centralised state-of-the-art technology infrastructure which will accelerate the product development and reduce the induction time & the turnaround time for the futuristic systems development through its six sub-centres."

At the foundation laying ceremony, the Defence Minister said: "At the time of the DTTC's inauguration, we had estimated an investment of Rs.3,732 crore. Investment of more than Rs.1,400 crore has already been received and the process is progressing rapidly."

<https://frontline.thehindu.com/dispatches/manufacturing-centre-for-the-brahmos-ng-supersonic-cruise-missile-to-come-up-in-lucknow-as-part-of-uttar-pradesh-defence-industrial-corridor/article38049740.ece>

## Business Standard

*Tue, 28 Dec 2021*

### **DRDO appoints Paras Defence and Space Technologies for border surveillance tech**

The Defence Research and Development Organization (DRDO) selected Paras Defence and Space Technologies for handing over the technology of border surveillance systems as developed by Instruments Research & Development Establishment and DRDO.

This technology has been transferred by a licensing agreement for transfer of technology (ToT) for border surveillance systems entered between the company, Instruments Research & Development Establishment (IRDE) and Defence Research and Development Organization (DRDO).

This system shall provide all weather surveillance for day and night monitoring of the border areas, it shall consist of Radar, EO sensors etc., mounted on Pan Tilt platforms. With this ToT, Paras Defence and Space Technologies shall be serving the requirement of the Armed Forces of the nation.

On a consolidated basis, the company reported a 72.4% rise in net profit to Rs 8.07 crore on a 58.9% increase in net sales to Rs 50.48 crore in Q2 FY22 over Q2 FY21.

Paras Defence and Space Technologies is primarily engaged in designing, developing, manufacturing and testing of a wide range of defence and space engineering products and solutions. Its product offerings cater to four major segments of Indian defence sector i.e. defence and space optics, defence electronics, electro-magnetic pulse (EMP) protection solution and heavy engineering for defence and niche technologies.

The initial public offer (IPO) of Paras Defence and Space Technologies was subscribed 304.26 times. It opened for bidding on 21 September 2021 and closed on 23 September 2021. The price band of the IPO was fixed at Rs 165-175 per share.

Shares of Paras Defence and Space Technologies surged 6.72% to close at Rs 732.40 on BSE.

[https://www.business-standard.com/article/news-cm/drdo-appoints-paras-defence-and-space-technologies-for-border-surveillance-tech-121122700671\\_1.html](https://www.business-standard.com/article/news-cm/drdo-appoints-paras-defence-and-space-technologies-for-border-surveillance-tech-121122700671_1.html)

## Defence News

### Defence Strategic: National/International

**TIMESNOWNEWS.COM**

Tue, 28 Dec 2021

## **Exclusive: Defence Procurement Board's big meeting on indigenous weaponry on 5-6 January**

*The Defence Procurement Board is expected to decide on the ministry's position after deciding what can be done and what is still difficult for India.*

*By Srinjoy Chowdhury*

New Delhi: With the Centre pushing for indigenous development and production of indigenous weaponry, a high-level meeting of the Defence Procurement Board is likely on January 5 and 6 to find the road ahead.

**The main issues before the DPB deal with buying weapons that are:**

- Made in India and looking towards foreign sellers only if the systems are not available in India or cannot be manufactured in India.
- Then, if foreign vendors are being considered, is joint development possible? Is production in India, preferably jointly, possible, including for export?
- Also, what has to be done with weapon systems that are already in the pipeline? Many weapon systems like the towed gun or the Kamov helicopter have been under discussion for a while.

The DPB, headed by Defence Secretary Ajay Kumar, is expected to decide on the ministry's position after deciding what can be done and what is still difficult for India. A top defence official said, India builds ships and submarines, develops missile systems and sensors and even tanks, but advanced fighter aircraft, particularly engines, are still out of reach.

The Defence Secretary, the three vice chiefs of the Army, Navy and Air Force and representatives of the Defence Research and Development Organisation and the defence production department will participate.

<https://www.timesnownews.com/india/article/exclusive-defence-procurement-board-s-big-meeting-on-indigenous-weaponry-on-january/844047>



Representational Image

## **Air Chief Marshal begins 4-day visit to Republic of Korea**

*Air Chief Marshal VR Chaudhari began a four-day visit to the Republic of Korea on Monday.*  
*By Abhishek Bhalla*

New Delhi: Chief of Air Staff Air Chief Marshal VR Chaudhari on Monday began a four-day visit to the Republic of Korea with an aim to further bolster bilateral military ties.

The Indian Air Force said the Air Chief Marshal will meet the top military brass of that country besides visiting important defence establishments.

“The Chief of Air Staff [CAS] will be calling on the minister of national defence, chairman of the joint chiefs of staff, chief of staff of the Republic of Korea Air Force,” it said in a statement.

Earlier this month, India and the Republic of Korea agreed to strengthen strategic cooperation including in dealing with challenges of terrorism, extremism and radicalisation.

The two sides discussed a range of key issues at the third India-Republic of Korea strategic dialogue held in New Delhi on December 3. South Korea has been a major supplier of weapons and military equipment to India. In 2019, the two countries finalised a roadmap for cooperation in the joint production of various land and naval systems.

<https://www.indiatoday.in/defence/story/air-chief-marshal-begins-4-day-visit-to-republic-of-korea-1892987-2021-12-27>



Air Chief Marshal VR Chaudhari is on a four day official visit to the Republic of Korea till December 30 (Photo: Twitter | @IAF\_MCC)

## **Rear Admiral Sameer Saxena takes charge as Fleet Commander of Navy's Western Fleet**

*Rear Admiral Sameer Saxena, NM took over as the Flag Officer Commanding Western Fleet from Real Admiral Ajay Kochhar, NM on December 27.*

*By Anurag Roushan*

Rear Admiral Sameer Saxena, NM took over as the Fleet Commander of Western Fleet from Real Admiral Ajay Kochhar, NM, who proceeds to take over as Project Director (Operations and Training) at HQ ATVP in New Delhi. The Western Fleet, also known as the Indian Navy's "Sword Arm," saw the change of helm on Monday, December 27. Rear Admiral Saxena was commissioned into the Indian Navy. He attended National Defence Academy in Khadakwasla, Defence Services Staff College in Wellington, and Naval War College in Newport (USA).

Rear Admiral Saxena's afloat appointments include being a member of the Direction Team of the INS Viraat and the Navigating Officer of the Indian Naval



Image: Indian Navy



Ships Kuthar, Godavari, and Delhi. He was also the Executive Officer of the INS Mumbai. He has commanded the Mauritian Coast Guard Ship Guardian as well as the Indian Naval Ships Kulish and Mysore. The senior naval officer was also the Fleet Operations Officer of Western Fleet.

**Rear Admiral Saxena also served as Naval Assistant to the Chief of Naval Staff**

A tenure at the Directorate of Personnel, as well as stint as Naval Assistant to the Chief of Naval Staff and Principal Director of Foreign Cooperation, all at IHQ MoD (N), were among his staff assignments. He also served as Naval Adviser at the Indian High Commission in London. On February 5, 2020, he assumed duties as Assistant Chief of Naval Staff (Policy and Plans) after being promoted to the Flag rank.

<https://www.republicworld.com/india-news/general-news/rear-admiral-sameer-saxena-takes-charge-as-fleet-commander-of-navys-western-fleet.html>



*Tue, 28 Dec 2021*

## **Touted as ‘Game-Changer’, what are Indian Navy’s ‘Anti-Submarine Warfare Shallow Water Crafts’?**

*By Shreya Mundhra*

GRSE, a Category 1 defense public sector undertaking and prominent warship builder of India, has laid the keel of the fifth of eight Anti-Submarine Warfare Shallow Water Crafts (ASWSWCs) recently.

These vessels will integrate some high-tech features while simultaneously boosting the “Make in India” initiative. The EurAsian Times takes a deep dive into ASWSWCs.

### **Indigenously Developed**

ASW vessels, which will replace the aging Russian Abhay-class corvettes that have been in service with the Indian Navy since 1989. The watercraft’s primary function is to conduct anti-submarine operations in coastal waters along with handling low-intensity maritime undertakings and mine laying operations.



Anti Submarine Warfare Shallow Water Craft.  
*(via Twitter)*

The craft whose keel was laid recently will have the ability to carry out full-scale subsurface surveillance of coastal waters. It will not only serve as a Search Attack Unit (SAU) but also coordinate anti-submarine warfare operations with aircraft.

In their secondary role, these ASW-SWCs will have the ability to prosecute intruding aircraft and lay mines in the sea bed.

The indigenous development of the first 700-ton ASWSWC was cleared by the Defence Acquisition Council (DAC) of the Ministry of Defence (MoD) in 2013. The vessel was intended to operate within 200 nautical miles of the base port, watching over foreign submarines working close to the coastline.

The Request for Proposal (RFP) for the design, construction and supply of the eight such corvettes was issued to private and public sector shipyards in 2014.

Five years later, in April 2019, Cochin Shipyard Limited (CSL) signed the contract for building and supplying eight such SWC for the Indian Navy. CSL won the contract through a competitive bidding process.

That same month, the MoD awarded a contract to build eight anti-submarine vessels to the public sector shipyard GRSE(Garden Reach Shipbuilders and Engineers Ltd.). The project this

company is in charge of is in collaboration with private Indian multinational conglomerate Larsen and Toubro (L&T).

Thus, the larger project has two parts: eight warships produced by CSL, and eight similar ones being built by GRSE.

According to a statement issued by the MoD, “The 1st ship is to be delivered within 42 months from contract signing date and subsequent balance ships delivery schedule will be two ships per year.” The contracts for the vessels cost the MoD \$1.9 billion.

The SWCs are expected to substantially strengthen the Indian Navy’s anti-submarine capability. The delivery of the ships is scheduled to begin from October next year, with each shipyard delivering two ships every year from then.

In August 2021, India Navy Vice Chief Vice Admiral SN Ghormade laid the keels of the first warship of the ASW-SWC project. In his speech on the occasion, the Admiral praised GRSE and L&T for their efforts in achieving this milestone despite constraints levied by the pandemic and subsequent lockdowns.

Ghormade had said the Shallow Water Craft, employed with uber-sophisticated underwater sensors and weapons, will give a boost to the Navy’s ASW capability.

### **Importance of ASWSWC**

With the increasing number of potent undersea forces in the concerned area of operations, ASW has gained significance at the strategic, operational as well as tactical levels. With their potential adversaries inducting modern submarines and relying on sea denial tactics, ASW has become an important way of enhancing their naval capability for most countries.

Speaking to EurAsian Times, Vice Admiral Shekhar Sinha (Retd.) who is also on the editorial board of The EurAsian Times, highlighted the importance of anti-submarine capabilities. He said, “irrespective of the geopolitical situation, submarines will continue to operate absolutely silently.

Any time that the tension becomes high, submarines generally remain deployed in the likely area of operation- even during peacetime. So it is important on the part of the country for its Navy to have adequate anti-submarine detection ability first and then the destruction capability.”

### **Key Features**

The shallow water corvettes are going to be huge. The planned overall length of each vessel is 78 meters while its breadth is to be 11.3 meters. The ships are expected to have a maximum draft of 2.7 meters at full load capacity. In addition, the corvettes will have the capacity to accommodate around 57 personnel, including seven officers, on board.

Owing to a water jet-powered propulsion system, the vessels will be able to reach a maximum speed of 25 knots. These warships will be given the ability to travel quickly for short periods in order to be able to maintain contact with submarines that are detected. These anti-submarine SWC vessels will have a displacement of 750t.

Moreover, they will be equipped with high-performance stealth and signature technologies. This will enable them to be largely undetectable as targets for surveillance systems as well as enemy submarines.

These technologies are especially helpful given the difficulties of detection in shallow waters. On this, the Admiral noted that shallow water submarine detection is tricky because the sound waves (used in sound navigation and ranging systems) tend to hit the soft mud and get reflected or get absorbed.

Submarines don’t operate in such shallow waters. However, he said, “there are smaller corvettes which have a shallow draft themselves. Their SONAR equipment can function in slightly shallower waters.”

The ASW-SWCs will also be equipped with technology that gives them the ability to relay information of adversary submarines to friendly anti-submarine vessels and aircraft through advanced data link networks. The warships will be designed to be equipped with various payloads to cater to the vessels’ functions.

## Weapon Systems Onboard

The warships will also have the ability to employ antisubmarine weapons, including the likes of lightweight torpedoes, anti-submarine warfare rockets, and combat management systems. The vessels will also be equipped with two 12.7 millimeters stabilized remote control guns with optronic control systems.

Various automated systems, including an integrated platform management system (IPMS), automatic power management system (APMS), and battle damage control system (BDCS) will be featured on these ASW-SWCs. Other important features of the corvettes include seabed and platform-based detection and monitoring systems, future underwater sensors, weapons, and decoys.

With this ensemble of technologies and weaponry, the warships are likely to be a good addition to maritime security wherever they are deployed.

When asked about the operational areas of the ASW-SWC, Sinha said, “generally speaking, anti-submarine crafts are outside the harbors where the ships are traversing day-in and day-out—Bombay, Goa, Gujarat—all the coastlines wherever the ships are operating.

At least the harbors from where the warships operate on a regular basis, there we will definitely have the shallow water anti-submarine operations and deepwater anti-submarine operations.

However, if this shifts into trade warfare then it can be put outside harbors where the merchant ships are also coming and going.”

<https://eurasianimes.com/touted-as-game-changer-what-are-indian-navys-anti-submarine-warfare-shallow-water-crafts/>



Tue, 28 Dec 2021

## ट्रायल सफल रहा: बीएसपी की स्पेशल प्लेट से बनेंगी पनडुब्बियां, अब तक इसके लिए विदेशी प्लेट का होता था इस्तेमाल

लेखक: उमेश निवल

भिलाई: अब बीएसपी की प्लेट्स से नौसेना की पनडुब्बियों का निर्माण होगा। इसमें इस्तेमाल होने वाली स्पेशल ग्रेड की प्लेट डीएमआर 249-ए ग्रेड को भी अपग्रेड किया गया है। जिसके उत्पादन का प्लेट मिल में ट्रायल सफल रहा। प्रबंधन को इंतजार अब नौसेना से आर्डर मिलने का है। अभी तक बीएसपी की प्लेट का इस्तेमाल पनडुब्बियों के रिपेयर में ही किया जा रहा है। देश पहली तीन परमाणु हमले वाली पनडुब्बियों को स्वदेशी रूप से बनाने की तैयारी में है। यह 95 फीसदी मेड इन इंडिया होंगी। इस प्रोजेक्ट पर लगभग 50,000 करोड़ खर्च का अनुमान है। इसे विशाखापट्टनम में रक्षा अनुसंधान और विकास संगठन (डीआरडीओ) द्वारा बनाया जाएगा।



स्पेशल ग्रेड की प्लेट अपग्रेड, ट्रायल पूरी तरह सफल।

### पनडुब्बियों के निर्माण में विदेशी प्लेट का इस्तेमाल

देश में जितनी भी पनडुब्बियों का निर्माण किया गया, उसके लिए स्पेशल ग्रेड की प्लेट्स रूस सहित अन्य देशों से मंगवाना पड़ रहा था। नौसेना अब मेक इन इंडिया के तहत भविष्य में बनाई जाने वाली पनडुब्बियों के निर्माण में भारत में उत्पादित स्पेशल ग्रेड की प्लेट्स का इस्तेमाल करेगा। नौसेना पहले से ही युद्ध पोतों के निर्माण के लिए बीएसपी में उत्पादित स्पेशल ग्रेड की प्लेट्स का उपयोग कर रहा है।

## दो इंजीनियर्स ने राउरकेला प्लांट में ली ट्रेनिंग

नौसेना की डिमांड को देखते हुए बीएसपी प्रबंधन तैयारी में जुट गया है। पनडुब्बियों के लिए डीएमआर 249-ए ग्रेड के अपग्रेड वर्जन का इस्तेमाल किया जाना है। प्रबंधन ने उस ग्रेड के प्लेट की जानकारी लेने के लिए अपने आरसीएल के दो एक्सपर्ट इंजीनियर्स को राउरकेला प्लांट भेजा। यहां इंजीनियर्स ने स्पेशल प्लेट्स के गुणवत्ता की जानकारी ली। इसके बाद प्लेट मिले में हुआ ट्रायल सफल रहा।

<https://www.bhaskar.com/local/chhattisgarh/bhilai/news/submarines-will-be-made-from-special-plates-of-bsp-till-now-foreign-plates-were-used-for-this-129247152.html>

# THE ECONOMIC TIMES

Tue, 28 Dec 2021

## India, Russia discuss joint defence production in Central Asia

By Dipanjan Roy Chaudhury

### Synopsis

*ET has learnt that India and Russia have exchanged a non-paper on increasing bilateral engagement and exploring joint projects in Central Asia, a region described by PM Narendra Modi as part of India's extended neighbourhood.*

India and Russia, following their 2+2 ministerial meet of foreign and defence ministers on December 6, have exchanged a non-paper on how to increase engagement that could include joint defence projects in Central Asia (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan) through existing Soviet-era defence factories in some of the republics in the region.

ET has learnt that India and Russia have exchanged a non-paper on increasing bilateral engagement and exploring joint projects in Central Asia, a region described by PM Narendra Modi as part of India's extended neighbourhood.

The non-paper explores several areas of engagement, one of which is defence as India aims to become defence exporter. These central Asian countries use Russian defence equipment and the non-paper has suggestions on joint Indo-Russian defence production in some of existing Soviet-era defence factories in some of Central Asian republics to meet local demands as well as India's demands, ET has reliably learnt. The Indian military has been using Soviet and Russian defence equipment for decades.

Russia has military pacts and arrangements with three of five Central Asian states (Kazakhstan-Kyrgyzstan-Tajikistan) and has military bases in Tajikistan and Kyrgyzstan. Collective Security Treaty Organisation (CSTO) led by Russia has been activated in Central Asia following the Taliban takeover of Kabul. Even before the August 15 development, Russia activated CSTO anticipating political changes in Kabul. Central Asian states remain wary of the radical Islam that could impact their secular societies.

A common point of cooperation between India and Russia in Central Asia is developments in the Afghan theatre and its spillover impact in the region. Another suggestion in the non-paper involves trilateral defence exercise between India-Russia and one of the Central Asian Republics, ET has learnt.

### The Russian Involvement

**Collective Security Treaty Organisation led by Russia has been activated in Central Asia following the Taliban takeover of Kabul**



Even before the August 15 development, Russia activated CSTO anticipating political changes in Kabul

**Central Asian states remain wary of the radical Islam that could impact their secular societies**

This comes close on the heels of India-Central Asia NSA-level meeting where Russia was also present and India Central Asia foreign ministers' dialogue, while India prepares to host presidents of these Central Asian states for 2022 Republic Day. The proposed visit by the five Central Asian leaders will also mark 30 years of creation of diplomatic ties between the two sides.

Central Asian states are keen to collaborate with India on a host of fields including education, IT, pharmacy and healthcare besides counter-terror cooperation, sources said.

Russia, which still retains considerable influence in the resource rich Central Asian Region and is often considered guarantor of security for the five states in the region, has been nudging India to play an active role in the landlocked region where China has made inroads due to its geographical contiguity.

On December 6 at the maiden 2+2 meet ahead of 21st of India-Russia summit, India and Russia explored cooperation in Central Asia, Indian Ocean Region and ASEAN. As part of expanding partnership in Central Asia and Indian Ocean region, India is pushing to expand Chabahar Port and its optimum usage and reinvigorating International North South Transport Corridor as the two major connectivity projects.

<https://economictimes.indiatimes.com/news/defence/india-russia-discuss-joint-defence-production-in-central-asia/articleshow/88513922.cms>

## THEWEEK

Tue, 28 Dec 2021

# Myanmar inducts used Chinese submarine, year after getting Indian vessel

*The UMS Minye Kyaw Htin is a Ming class submarine*

Myanmar's Navy has announced it has inducted a diesel-electric submarine that was previously part of China's People's Liberation Army Navy.

Reports on Monday said the UMS Minye Kyaw Htin was inducted into service on December 24, which also marked the 74th anniversary of the establishment of Myanmar's Navy.

In December 2020, the Indian Navy transferred a Russian-built submarine, the INS Sindhuvir, to Myanmar. Sindhuvir, which was a Russian Kilo class design, had been renamed UMS Minye Theinkhathu by Myanmar.

The UMS Minye Kyaw Htin is a Chinese Ming class submarine. China began producing the Ming class submarines in 1974, but the type is being retired from the People's Liberation Army Navy as newer designs are inducted.

*The Irrawaddy*, a news outlet run by Myanmar exiles, reported on Monday “The deal to purchase the Ming-class submarine was reached in secret with Beijing over the past year. In the past, Myanmar is believed to have balked at a Chinese condition that its technicians be allowed to maintain any vessels it provides. It is not clear whether this condition was attached this time.”

Myanmar has been mulling purchase of submarines for over a decade. China's *Global Times* had criticised Myanmar for taking up the Indian Navy offer of the Sindhuvir. The *Global Times* claimed in October 2020 “India wants to get rid of a retired and outdated submarine”. The publication claimed “Although India said that the submarine could serve the Myanmar army to at least 2030 after refitting, Chinese analysts doubted the submarine's functionality, as it had served in



The UMS Minye Kyaw Htin | Tatmadaw Information Team

Indian army for more than 30 years, entering the end of a submarine's life - and the refitting only gave it refurbishment, but did not upgrade its system and facilities.”

Analysts had attributed the Chinese criticism to the rivalry between Beijing and New Delhi for influence with Myanmar’s military.

*The Irrawaddy* added that with two submarines in its fleet, Myanmar was in negotiations with Russia to “acquire one of its Project 636 Improved Kilo submarines”. The Project 636 class is an improved derivative of the original Kilo class design.

<https://www.theweek.in/news/world/2021/12/27/myanmar-inducts-used-chinese-submarine-year-after-getting-indian-vessel.html>

## Science & Technology News



Tue, 28 Dec 2021

# From Gaganyaan to Chandrayaan-3 space missions, India aims to fly high in 2022

*2022 looks promising for Isro as it goes ahead with several space missions that had been delayed due to Covid-19 in 2021.*

New Delhi: With 2021 coming to an end amid a new surge of cases due to the omicron variant of coronavirus, people are hopeful of better days in the new year. The Indian Space Research Organisation is one such entity that will be hoping for less work restrictions in the new year.

India's premier space agency will be looking for better days in 2022 as it plans to speed up several missions that have been delayed due to successive lockdowns in 2021. Isro has already hinted that there will be more launches, enhanced bilateral cooperation and possibly a new era will be ushered for space science in 2022.

**Here are the big-ticket missions that are scheduled for 2022 by ISRO:**

### **Gaganyaan to take wings**

India's ambitious Gaganyaan mission that aims to send the first batch of Indian astronauts into space on an indigenous developed spacecraft will see a renewed push in 2022 as Isro conducts the first uncrewed launch. The space agency will conduct the test vehicle flight for the validation of Crew Escape System performance and the first uncrewed mission of Gaganyaan at the beginning of the second half of 2022.

The second uncrewed mission has been scheduled for the end of 2022 after which, three Indian Air Force officers, undergoing training, will launch into space. Four IAF officers have been selected for the mission, whose identities remain confidential. Science & Technology Minister Dr Jitendra Singh had said earlier this month that the program got slightly delayed due to Covid restrictions, but preparations are now in full swing to achieve the mission by 2023. He said that the objective of the Gaganyaan programme is to demonstrate the capability to send humans to low earth orbit (LEO) onboard an Indian launch vehicle and bring them back to earth safely.

### **Aditya L1 Mission to Sun**

India's maiden mission to study the Sun, Aditya L1 will be launched in 2022 after being delayed by a year due to Covid-19 restrictions. The Aditya-L1 mission is expected to be inserted in a halo

orbit around the Lagrange point 1 (L1) - which is 15,00,000 kilometres away from Earth. Aditya, which is the Sanskrit word for 'sun' -- will be ISRO's second high-profile space mission after it launched its Mars orbiter in 2013.

### **Chandrayaan-3 to carry forward Moon mission legacy**

Isro will launch the ambitious Chandrayaan-3 mission in the third quarter of 2022 after work was delayed due to Covid-19 led lockdowns. The mission was slated to launch in 2021. The Chandrayaan-3 takes cues from the first Chandrayaan mission launched in October 2008 that made major discoveries including finding evidence of water on the lunar surface. The third moon mission comes two years after the Chandrayaan-2 crash-landed on the far side of the Moon.

While the lander and the rover crashed, the orbiter is still hovering above the lunar surface and Isro plans to use it with Chandrayaan-3 as well. Isro chief K Sivan has said, "We are working on it. It is the same configuration as Chandrayaan-2 but it will not have an orbiter. The orbiter launched during Chandrayaan-2 will be used for Chandrayaan-3. With that, we are working on a system and mostly the launch will be next year in 2022."

### **SSLV to make India hot-spot for low-cost launches**

With India emerging as a hot spot for launching satellites to low-Earth Orbit, Isro is developing the Small Satellite Launch Vehicle (SSLV). The space agency will conduct the maiden launch in the first quarter of 2022. The SSLV will provide a payload capability of 500 kilograms to a 500-kilometre planar orbit. By comparison, the PSLV — the workhorse of Isro — can take up to a 1,750-kilogram payload into SSO of 600 km altitude. Centre has provided Rs 169 crores for developing SSLV, which is a three-stage all solid vehicle with options of mounting multiple satellites including nano and micro.

It is to be noted that Isro has signed six agreements with four countries to launch satellites in 2021-2023, generating 132 million euros in revenue.

<https://www.indiatoday.in/science/story/isro-space-missions-2022-year-ender-gaganyaan-chandrayaan3-sslv-aditya-11-1892727-2021-12-27>



*Tue, 28 Dec 2021*

## **Researchers construct a framework to solve bound and scattering state problems in quantum mechanics education**

In a study published in *Physical Review-Physics Education Research*, a research team led by Academician Guo Guangcan from the University of Science and Technology of China (USTC) of the Chinese Academy of Sciences has successfully constructed a theoretical framework of Activation-Construction-Execution-Reflection as well as a thinking mechanism model based on Overgeneralization to help students solve bound and scattering state problems in quantum mechanics education.

Education research on mechanics is an emerging field in physics. The research on quantum physics is notably appraised as "just the tip of the iceberg" by C. Wieman, a Nobel Prize winner for physics. The research team led by Academician Guo Guangcan appropriately pays close attention to and enters this emerging frontier field.

There are two schools in the field of research on physics education. One is represented by G. Parisi, a Nobel Prize winner for physics, who values statistics from the perspective of complexity science. The other one is represented by C. Wieman, another Nobel Prize winner for physics, who values empirical investigation from the perspective of pedagogy. The research team from USTC combined these two methods to do research on the thinking framework of students learning bound

and scattering state in quantum mechanics by statistical analysis of 406 undergraduates from the School of Physical Sciences for a six-year duration. The team has successfully constructed a theoretical framework of Activation-Construction-Execution-Reflection as well as a thinking mechanism model based on Overgeneralization.

A complex circuit network has numerous nodes. These nodes are either connected or disconnected. Only if all the nodes are of a series connection will the percolation threshold be attained and the whole circuit network will achieve connectivity.

Similarly, the knowledge memory of one student is also composed of different nodes that represent different knowledge fragments in a specific field of physics. Students need to connect these nodes in their brains according to the relation of physical knowledge. When all the knowledge nodes are connected through a right relation in a proper manner, the students' thinking process will achieve a percolation threshold, which enables students to master relevant physical knowledge and solve physical problems.

The researchers used the above knowledge model to concentrate on students' difficulties with solving bound and scattering state problems in quantum mechanics and found an interesting framework in their mind including activation of relevant concepts, construction of differential equations, execution of analytic calculation, and reflection on problem-solving processes. Common difficulties focused on three key nodes: (1) recognizing when the time-dependent Schrodinger equation is the appropriate model; (2) selecting a range of the energy constants that satisfies the bound or scattering state; (3) deciding when to use a superposition form of the wave functions. These research findings not only provide students with a profound understanding of the underlying reasoning mechanisms for quantum physics, but also offer abundant resources to quantum physics instruction. That is to say, if students get help when solving these crucial nodes, they will acquire knowledge from an overall connected perspective instead of a partially connected view. That is the proper learning mode.

The findings of the study show a new breakthrough of USTC in this field and will have significant implications for education research in China.

**More information:** Tao Tu et al, Students' difficulties with solving bound and scattering state problems in quantum mechanics, *Physical Review Physics Education Research* (2021). DOI: [10.1103/PhysRevPhysEducRes.17.020142](https://doi.org/10.1103/PhysRevPhysEducRes.17.020142)  
<https://phys.org/news/2021-12-framework-bound-state-problems-quantum.html>



