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समाचार पत्रों से चयित अंश
Newspapers Clippings

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DRDO News

DRDO Technology News

Press Information Bureau
Government of India

Ministry of Defence

Thu, 24 Feb 2022 2:03PM

Post budget webinar of Ministry of Defence 'Aatmanirbharta in Defence - Call to Action' to be held tomorrow

Union Budget 2022-23 related to Ministry of Defence has given further impetus to Aatmanirbharta in Defence. In this regard, Ministry of Defence has organised a post budget webinar titled 'Aatmanirbharta in Defence - Call to Action' on the announcements made in the budget. The objective of the webinar is to involve all the stakeholders in taking forward the various initiatives of the Government in the defence sector.

The webinar will be held on February 25, 2022 from 1030 hrs to 1415 hrs. Prime Minister Shri Narendra Modi will deliver the inaugural address. The webinar will have panel discussions with eminent speakers and experts from Ministry of Defence, defence industry, Industry fora, startups, academia, defence corridors etc., along with interactive sessions with the stakeholders. The valedictory session will be chaired by Raksha Mantri Shri Rajnath Singh. The webinar will have breakout sessions on the following four themes:

1. Progressive increase in the capital procurement budget for domestic industry – (Opportunities & Challenges)
2. Developing All round Defence R&D ecosystem in the country
3. Special Purpose Vehicles (SPVs) by Industries with DRDO and other organisations
4. To meet wide ranging testing and certification requirements - Setting up an independent nodal umbrella body.

The sessions are planned in a manner to allow for ample interaction with stakeholders, with a view to evolve a participative approach for time-bound implementation of announcements. The webinar will also be streamed live on the YouTube channel of Department of Defence Production.

https://pib.gov.in/PressReleasePage.aspx?PRID=1800755

पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Thu, 24 Feb 2022 2:03PM

रक्षा मंत्रालय के पोस्ट-बजट वेबिनार 'रक्षा में आत्मनिर्भरता- कॉल टू एक्शन' का आयोजन कल

रक्षा मंत्रालय से संबंधित केंद्रीय बजट 2022-23 में रक्षा के क्षेत्र में आत्मनिर्भरता को और मजबूती देने पर जोर दिया गया है। इस संबंध में, रक्षा मंत्रालय बजट में की गई घोषणाओं पर 'रक्षा में आत्मनिर्भरता- कॉल टू एक्शन' शीर्षक से एक वेबिनार का आयोजन कर रहा है। वेबिनार का उद्देश्य रक्षा क्षेत्र में सरकार की विभिन्न पहलों को आगे बढ़ाने में सभी हितधारकों को शामिल करना है।

वेबिनार 25 फरवरी, 2022 को सुबह 10:30 बजे से दोपहर 02:15 बजे तक आयोजित किया जाएगा। उद्घाटन भाषण प्रधानमंत्री श्री नरेन्द्र मोदी देंगे। वेबिनार में रक्षा मंत्रालय, रक्षा उद्योग, स्टार्टअप्स, अकादमिक जगत और डिफेंस कोरिडोर आदि के प्रख्यात वक्ताओं और विशेषज्ञों के साथ पैनल चर्चा होगी, साथ ही हितधारकों के साथ इंटरैक्टिव सेशन भी होंगे। समापन सत्र की अध्यक्षता रक्षा मंत्री श्री राजनाथ सिंह करेंगे। वेबिनार में निम्नलिखित चार विषयों पर ब्रेकआउट सत्र होंगे:

1. **घरेलू उद्योग के लिए कैपिटल प्रक्योरमेंट बजट में प्रगतिशील वृद्धि- (अवसर और चुनौतियां)**
2. **देश में सर्वांगीण रक्षा अनुसंधान एवं विकास इकोसिस्टम विकसित करना**
3. **डीआरडीओ और अन्य संगठनों के साथ उद्योगों द्वारा स्पेशल पर्पस व्हीकल्स (एसपीवी)**
4. **व्यापक टेस्टिंग और सर्टिफिकेशन आवश्यकताओं को पूरा करने के लिए- एक स्वतंत्र नोडल संस्था की स्थापना।**

घोषणाओं को समयबद्ध लागू के लिए एक सहभागी दृष्टिकोण विकसित करने के मकसद से सत्रों की योजना इस तरह से बनाई गई है कि सभी हितधारकों के साथ पर्याप्त बातचीत हो सके। वेबिनार को रक्षा उत्पादन विभाग के यूट्यूब चैनल पर भी लाइव स्ट्रीम भी किया जाएगा।

https://pib.gov.in/PressReleasePage.aspx?PRID=1800781

Press Information Bureau
Government of India

రక్షణ మంత్రిత్వ శాఖ

Thu, 24 Feb 2022 2:03PM

రక్షణ మంత్రిత్వ శాఖకు సంబంధించిన పోస్ట్ బడ్జెట్ వెబ్‌నార్ ‘ రక్షణలో ఆత్మనిర్భర్త - కాల్ టు యాక్షన్’ రేపు జరగనుంది

రక్షణ మంత్రిత్వ శాఖకు సంబంధించిన కేంద్ర బడ్జెట్ 2022-23 రక్షణలో ఆత్మనిర్భర్తకు మరింత ఊపునిచ్చింది. దీనికి సంబంధించి బడ్జెట్‌లో చేసిన ప్రకటనలపై రక్షణ మంత్రిత్వ శాఖ ‘రక్షణలో ఆత్మనిర్భర్త -కాల్ టు యాక్షన్’ పేరుతో పోస్ట్ బడ్జెట్

వెబ్‌నార్‌ను నిర్వహిస్తోంది. రక్షణ రంగంలో ప్రభుత్వం చేపడుతున్న వివిధ కార్యక్రమాలను ముందుకు తీసుకెళ్లడంలో వాటాదారులందరినీ భాగస్వామ్యం చేయడం ఈ వెబ్‌నార్ యొక్క లక్ష్యం.

వెబ్‌నార్ ఫిబ్రవరి 25, 2022న 1030 గంటల నుండి 1415 గంటల వరకు నిర్వహించబడుతుంది. ప్రధాన మంత్రి శ్రీ నరేంద్ర మోదీ ప్రారంభోపన్యాసం చేస్తారు. వెబ్‌నార్‌లో రక్షణ మంత్రిత్వ శాఖ, రక్షణ పరిశ్రమ, పరిశ్రమల వేదిక, స్టార్టప్‌లు, విద్యాసంస్థలు, రక్షణ కారిడార్లు మొదలైన ప్రముఖ వక్తలు మరియు నిపుణులతో ప్యానెల్ చర్చలు జరుగుతాయి, అలాగే వాటాదారులతో ఇంటరాక్టివ్ సెషన్‌లు ఉంటాయి. రక్షణ మంత్రి శ్రీ రాజ్‌నాథ్ సింగ్ అధ్యక్షతన సమర్పణ జరుగుతుంది. వెబ్ నార్ కింది నాలుగు థీమ్‌లపై బ్రేక్‌అవుట్ సెషన్‌లు ఉంటాయి:

1. దేశీయ పరిశ్రమ కోసం మూలధన సేకరణ బడ్జెట్‌లో ప్రగతిశీల పెరుగుదల – (అవకాశాలు & సవాళ్లు)
2. దేశంలో ఆల్ రౌండ్ డిఫెన్స్ ఆర్&డి పర్యావరణ వ్యవస్థను అభివృద్ధి చేయడం
3. డీఆర్‌డీఓ మరియు ఇతర సంస్థలతో పరిశ్రమల ద్వారా స్పెషల్ పర్పస్ వెహికల్స్ (ఎస్‌పివిలు)
4. విస్తృత శ్రేణి పరీక్ష మరియు ధృవీకరణ అవసరాలను తీర్చడానికి - స్వతంత్ర నోడల్ అంబ్రెల్లా బాడీని ఏర్పాటు చేయడం.

సెషన్‌లు సమయానుకూలంగా ప్రకటనల అమలు కోసం భాగస్వామ్య విధానాన్ని అభివృద్ధి చేయాలనే ఉద్దేశ్యంతో వాటాదారులతో తగినంత పరస్పర చర్యను అనుమతించే విధంగా ప్రణాళిక చేయబడింది. డిపార్ట్‌మెంట్ ఆఫ్ డిఫెన్స్ ప్రొడక్షన్ యూట్యూబ్ ఛానెల్‌లో వెబ్‌నార్ ప్రత్యక్ష ప్రసారం చేయబడుతుంది.

https://pib.gov.in/PressReleasePage.aspx?PRID=1800830

The Indian EXPRESS

Fri, 25 Feb 2022

Explained: What is quantum tech demo by DRDO and IIT Delhi all about

Here's what this means and how to look at it in the context of developments in the field of quantum technologies, at home and across the world.

By Sushant Kulkarni

In a crucial development for quantum technology in India, a joint team of experts from the Defence Research and Development Organisation (DRDO) and Indian Institute of Technology (IIT) Delhi demonstrated Quantum Key Distribution (QKD) link for a distance of over 100 kilometres.

Here's what this means and how to look at it in the context of developments in the field of quantum technologies, at home and across the world.

QKD is primarily a mechanism to undertake secure communication, which utilises a cryptographic protocol involving various components of quantum mechanics.

The latest development

The Ministry of Defence (MoD) said Wednesday that a joint team of scientists and engineers from DRDO and IIT Delhi successfully demonstrated Quantum Key Distribution (QKD) link for a distance of over 100 km between Prayagraj and Vindhyachal in Uttar Pradesh. The technological breakthrough was achieved over the commercial-grade optical fibre already available in the field.

"With this success, the country has demonstrated indigenous technology of secure key transfer for bootstrapping military-grade communication security key hierarchy. This technology will

enable security agencies to plan a suitable quantum communication network with indigenous technology backbone," said the MoD. The ministry said that for this demonstration performance parameters were closely monitored and were found to be repetitively within the reported international standards.

QKD is primarily a mechanism to undertake secure communication, which utilises a cryptographic protocol involving various components of quantum mechanics. The technology enables two communicating sides to come up with random secret keys shared by both of them and known exclusively to them, so only they can use it to encrypt and decrypt messages, thus achieving a very highly-secure communication.

Secure communications are vital not just for the defence and strategic agencies across the globe but also for various civilian applications. The distribution of encryption keys is the crucial factor for this. Sharing of keys over the air or wired links requires encryption, which in turn requires encryption keys to be pre-shared. Quantum-based communication offers a robust solution to sharing the keys securely. DRDO has undertaken multiple projects for the development of this technology.

Developments by DRDO in the past

Scientists have said that the latest test further proves India's capabilities over longer distances and amidst different environmental factors.

A similar demonstration was held over a shorter distance in the first week of December 2020, when the technology was tested for communication between two DRDO facilities in Hyderabad—the Defence Research and Development Laboratory (DRDL) and Research Centre Imarat (RCI)—over a distance of 12 km.

Then in the last week of December 2020, DRDO Young Scientist Laboratory for Quantum Technologies (DYSL-QT), a DRDO facility based in Mumbai, developed a Quantum Random Number Generation (QRNG), which has the ability to detect random quantum events and convert those into a stream of binary digits. The QRNG system developed by DYSL-QT passed the global randomness testing standards of NIST and Die-harder Statistical Test Suites at the speed of around 150 kbps after post-processing. The generated random numbers were also evaluated and verified using DRDO's indigenously developed Randomness Testing Statistical Test Suite of Scientific Analysis Group. With this development, India had entered the club of countries that have the technology to achieve the generation of random numbers based on the Quantum Phenomenon.

How to look at it in the context of developments at home and abroad?

Most of the large economies and defence powers across the world have in the recent past formulated dedicated plans for the development of quantum technologies. These countries include the US, Canada, several European countries, China, Japan and South Korea. India has seen significant policy decisions and budget allocation for the sector.

However, senior DRDO scientists and defence officials say that developments in India need to be seen especially in the context of several claims made by China. China has said that it has achieved multiple breakthroughs in the quantum technology domain that included the world's first quantum satellite, the world's first optical quantum computing machine prototype and also a 2000 km long quantum communication link between Beijing and Shanghai. China's 13th and 14th five-year plans give high priority to quantum technology. Experts have said that in the context of China's progress—or claims thereof—in quantum technology, India's efforts, though significant, are scattered in nature.

An international symposium on Quantum Information Technology held in Pune in 2019 saw participation of key defence, civilian and academic and strategic entities of the country. What India's National Cyber Security Coordinator, Lieutenant General Rajesh Pant had said at this 2019 conference is very significant. "My concern is China leading the race. It established the first Quantum Satellite Network and distributed entangled photons between three terrestrial base stations separated by 1200 km. Quantum is at the heart of China's 13th five-year plan. Chinese

dominated in Quantum Computing patents in the last four years. As if this was not enough, the global investments in quantum computing are also growing," said Pant.

"The US National Quantum Initiative Act has assured $1.2 Billion, the European Union – 1 billion Euros. What is the situation in India? We find a mix of private and government sector investments. We have companies working on Quantum Key Distribution (QKD) aspect, post-quantum cryptography and Artificial Intelligence platform on quantum. DRDO is also doing very significant work as also the Department of Science Technology, which has launched a quantum enabled science and technology project. But I find many gaps in the Indian scenario. There is an absence of a quantum roadmap. There is no visibility in the quantum efforts and successes. And there is a lack of required skill power. As the National Cyber Security Coordinator this is a cause of concern for me," he added.

DRDO scientists, who had participated in the conference, say that while India has come a long way in quantum technology since 2019, more can be done to bring all the efforts together.

Meanwhile, in two very significant developments in the sector, India's Union Budget of 2020-21 saw the allocation of Rs 8,000 crore towards the National Mission on Quantum Technologies and Applications and in December 2021, the Indian Army, with support from the National Security Council Secretariat (NSCS) established the Quantum Lab at Military College of Telecommunication Engineering, Mhow to spearhead research and training in this key developing field.

https://indianexpress.com/article/explained/explained-what-is-quantum-tech-demo-by-drdo-and-iit-delhi-all-about-7789057/

Fri, 25 Feb 2022

DRDO's Quantum Key Distribution tech will make military communications more secure

By Monit Khanna

Highlights

- ***DRDO and IIT-Delhi scientists made this possible over a commercial-grade fibre optic cable that was already available in the field.***
- ***According to DRDO, with this success, the nation has demonstrated indigenous technology of secure key transfer for assisting military-grade communication security key hierarchy.***
- ***Upon measuring the performance parameters, they found that the results were within the reported international standards as sifted key rates of up to 10KHz.***
- ***This technology will enable security agencies to plan a suitable quantum communication network with indigenous technology backbone.***

Scientists from the Defence Research and Development Organisation (DRDO) as well as IIT Delhi have, for the first time in India, successfully demonstrated quantum key distribution between Prayagraj and Vindhyachal in Uttar Pradesh over a distance of over 100 kilometres, according to an IANS report.

Unsplash

To the unaware, quantum key distribution is a secure communication method that harnesses cryptographic protocol involving components of quantum mechanics. It allows two groups to produce a shared random secret key known only to them that can be used to encrypt and decrypt messages.

Quantum communication is protected with high levels of code that cannot be decrypted. If a third entity tries to intercept the communication, it is easily detected as it alters the code.

DRDO and IIT-Delhi scientists made this possible over a commercial-grade fibre optic cable that was already available in the field. According to DRDO, with this success, the nation has demonstrated indigenous technology of secure key transfer for assisting military-grade communication security key hierarchy.

Upon measuring the performance parameters, they found that the results were within the reported international standards as sifted key rates of up to 10KHz. This technology will enable security agencies to plan a suitable quantum communication network with indigenous technology backbone.

The efforts were lauded by the Secretary Department of Defence R&D and Chairman DRDO Dr. G Satheesh Reddy. To the team behind this, Reddy stated that it was one of the shining examples of synergistic research between DRDO and the Indian Institute of Technology, Delhi.

https://www.indiatimes.com/technology/science-and-future/drdos-quantum-key-distribution-tech-will-make-military-communications-more-secure-562842.html

Press Information Bureau
Government of India

Ministry of Defence

Thu, 24 Feb 2022 7:35PM

MoD signs contract worth 1075 crore with M/s BEL for the supply of 957 Commander Thermal Imager cum Day Sights for T-90 Tanks

Providing a further boost to the 'Make in India' initiative of the Government of India in the Defence Sector, the Acquisition Wing of the Ministry of Defence has today signed a contract for Rs. 1075 crore with M/s Bharat Electronics Limited (BEL) for the retro-modification of Commander Sight of Battle Tanks-T-90. The retro-modification will be carried out in 957 T-90 tanks of the Indian Army.

Commander sight of Battle Tank T-90, India's premier battle tank, is presently fitted with Image Converter (IC) tube-based sight for night viewing. Based on the requirement projected by the Indian Army, DRDO and BEL have jointly designed and developed an advanced Mid Wave Thermal Image (MWIR) based sight as a replacement for the existing IC-based sight.

The new retro-modified Commander sight employs a thermal imager capable of detecting the targets at 8 Kms during day and night and a Laser Ranger Finder (LRF) to find the ranges accurately up to 5 Kms, thereby enhancing its capability to engage target at longer ranges. With the corrections from ballistic software and LRF, the Commander of T-90 can detect, engage and neutralize the targets with phenomenal accuracy. The indigenously developed sight completed extensive evaluations under field conditions successfully.

The successful indigenous development of Thermal Imager based Commander Sight will provide further fillip to indigenous R&D and defence manufacturing.

https://pib.gov.in/PressReleasePage.aspx?PRID=1800878

अमर उजाला

Fri, 25 Feb 2022

सेना की ताकत बढ़ेगी: टी-90 युद्धक टैंक को किया जाएगा अपग्रेड, रक्षा मंत्रालय खर्च करेगी 1075 करोड़ रुपये

सार

रक्षा मंत्रालय ने गुरुवार को भारत इलेक्ट्रॉनिक्स लिमिटेड (बीईएल) के साथ 1,075 करोड़ रुपये के अनुबंध पर हस्ताक्षर किए हैं। इस अनुबंध के तहत युद्धक टैंक टी-90 के कमांडर साइट का रेट्रो-मॉडिफिकेशन किया जाएगा।

विस्तार

नई दिल्ली: भारतीय सेना की ताकत लगातार बढ़ रही है। रक्षा मंत्रालय ने गुरुवार को भारत इलेक्ट्रॉनिक्स लिमिटेड (बीईएल) के साथ 1,075 करोड़ रुपये के अनुबंध पर हस्ताक्षर किया है। रक्षा मंत्रालय के मुताबिक, इस अनुबंध के तहत 957 टी-90 युद्धक टैंकों का रेट्रो-मॉडिफिकेशन किया जाएगा। इसके बाद टी-90 के कमांडर लंबी दूरी पर भी लक्ष्य का पता लगा सकेंगे।

मंत्रालय के बयान में कहा गया है कि भारत के प्रमुख युद्धक टैंक टी-90 की कमांडर साइट रात में देखने के लिए इमेज कन्वर्टर ट्यूब आधारित ट्रिप्टि से सुसज्जित है। इसे रक्षा अनुसंधान विकास संगठन (डीआरडीओ) और बीईएल ने संयुक्त रूप से विकसित किया है।

टी-90 टैंक (फाइल फोटो) - फोटो : ANI

टी-90 टैंक की नई रेट्रो-मॉडिफाइड कमांडर साइट में दिन और रात में 8 किमी पर लक्ष्य का पता लगाने में सक्षम थर्मल इमेजर और 5 किमी तक की दूरी को सटीक रूप से खोजने के लिए एक लेजर रेंजर फाइंडर (एलआरएफ) लगाया गया है। जिससे लंबी दूरी तक लक्ष्य साधने की क्षमता बढ़ गई है। रक्षा मंत्रालय ने बताया कि टी-90 टैंक के कमांडर बैलिस्टिक सॉफ्टवेयर और एलआरएफ में सुधार के बाद अभूतपूर्व सटीकता के साथ निशाने का पता लगा सकते हैं, उस पर निशाना साध सकते हैं और उन्हें बेअसर कर सकते हैं।

गौरतलब है कि भारत में टी-90 टैंक को भीष्म के नाम से जाना जाता है। इसमें कई खासियतें हैं। इस युद्धक टैंक में धुएं को पैदा करने वाला ग्रेनेड लांचिंग सिस्टम भी लगाया गया है। इसके अलावा यह टैंक दुश्मन के एंटी टैंक मिसाइल को भी निष्क्रिय करने में सक्षम है। इसमें ऑटोमेटिक फायर प्रोटक्शन सिस्टम भी लगा हुआ है। यह टैंक अपने साथ 40 राउंड के गोले लेकर चल सकता है।

https://www.amarujala.com/india-news/bharat-electronics-limited-and-national-defense-ministry-signed-contract-worth-rs-1075-crore-for-retro-modification-of-battle-tank-t-90

edugraph

Fri, 25 Feb 2022

KIIT International School hosts science showcase

Summary

- ***Exhibition marks 75th Azadi ka Amrit Mahotsav Science Showcase: Roadmap to 2047***
- ***Students and teachers interact with grassroots scientists***

Models of various missiles and armament systems are on display at an exhibition at KIIT International School, Bhubaneswar, as part of the 75th Azadi ka Amrit Mahotsav Science Showcase: Roadmap to 2047.

Guests at the inauguration of the science exhibition at KIIT International School, Bhubaneswar. Source: KIIT International School

The weeklong exhibition is being organised by the Defence Research and Development Organisation (DRDO) in collaboration with Integrated Test Range (ITR), NIF, IMMT, STD (Govt. of Odisha), ORSAC, Odisha Bigyan Academy, IMA and KIIT-TBI.

The missile models on display include Agni, Akash, Prithvi, Brahmos, Astra, Nag and armament systems (MBT Arjun Tank, Artillery Gun).

Students and teachers from schools in Bhubaneswar participated in the exhibition and interacted with about 20 grassroots scientists who have been felicitated by the National Innovation Foundation. About 1,200 delegates have registered for the event.

The exhibition was inaugurated in the presence of M.K. Mishra, secretary, E&IT and Science and Technology, Government of Odisha; P.K. Mallick, additional PCCF and chief executive, ORSAC; K. Srinivasan, regional officer, CBSE, Bhubaneswar; and Achyuta Samanta, founder, KIIT and KISS; Mona Lisa Bal, chairperson, KIIT International School; and Sanjay Suar, principal, KIIT International School.

“Science is the understanding of different things. Technology is the way to take science forward. Science should be for common people. Nowadays technology has become our way of life. Everybody experienced the importance of technology during the pandemic,” Mishra said.

Mallick encouraged students to develop a scientific temper and learn to practise it. “We need science to grow, live, and develop. Science and technology are two hands of humans. Conceptualising something is science, while making it reality is technology,” he said.

Azadi ka Amrit Mahotsav is being celebrated at 75 locations across the country, with the main programme in Delhi. Science and technology organisations of the country are committed to ensuring that the benefits of science, technology and innovation reach the masses and help the society circumvent various problems.

KIIT International School chairperson Bal said the school was proud to be a part of Azadi ka Amrit Mahotsav. “Science and technology have always been an essential part of our existence and now more than ever we have realised its importance with the pandemic. We are entering the post-digital era where technology will be an intrinsic part of our lives. We are already experiencing and making use of science and technology in almost every aspect of our daily lives from going to places to ordering groceries and even learning. Aligning with the vision of the Government of India, this exhibition is especially relevant in the current times, and I hope all the children visiting this learn something new and are inspired to embrace science and technology.”

https://www.telegraphindia.com/edugraph/news/kiit-international-school-hosts-science-showcase/cid/1853317

THE HINDU

Fri, 25 Feb 2022

Science expo continues to draw big crowds

Demonstration on principles behind various scientific components held

P. Gopikrishna, Group Director, Indian Space Research Organisation (ISRO), Sriharikota, on Thursday, explained about the core areas of the Indian space programmes such as satellite communication, disaster management, earth observation and space science and planetary exploration.

Speaking on "Five Decades of Indian Space Programme' at an event organised on the third day of the ongoing Science Week Festival at the School of Planning and Architecture, Vijayawada (SPAV), on the theme "Milestones of Modern Science and Technology", he threw light on navigation, communication and planetary satellites like Gagan, INSAT, MOM, Aditya etc.

He said the exhibition showcased the technological advancements and various stages of developments achieved by the ISRO, including the various satellites, starting from SLV 3 to GSLV Mk III. He also spoke at length about the space centres across the nation, organisation hierarchy, the uniqueness of Sriharikota launch pad and the various activities carried out by the ISRO.

Scientist 'F', Defence Research and Development Laboratory (DRDL), Hyderabad, Naresh Kumar spoke on "Milestones of DRDO".

Explaining the genesis, growth and the milestones achieved by the DRDO, he spoke about how it became the country's largest and most diverse research organisation. He said the mission of the organization was to empower India with cutting edge technology and make Indian Defence System self-reliant.

A video footage showcasing the achievements of the DRDO was also presented.

R. Siva Nageswara Rao and G. Srihari Prasad demonstrated the principles behind various scientific components such as pressure, force, sound and aerodynamics using simple material used in daily life. D. Sujan Kumar and K. Nageswara Rao performed a 'magic show' and explained the scientific theories engaged to trick people.

Organising secretary and Head of the Department of Planning, SPAV, Abdul Razak Mohammed and a host of others were present. A large number of students from local schools and colleges visited the exhibition.

https://www.thehindu.com/news/national/andhra-pradesh/science-expo-continues-to-draw-big-crowds/article65081639.ece

हिन्दुस्तान

Fri, 25 Feb 2022

डीआरडीओ के वैज्ञानिकों ने छात्रों को दी महत्वपूर्ण जानकारियां

श्रीनगर: गौरवशाली विज्ञान सप्ताह के तहत विज्ञान सर्वत्र पूज्यते की थीम पर गढ़वाल विवि के चौरास परिसर में आयोजित विज्ञान महोत्सव के तीसरे दिन भारतीय रक्षा एवं अनुसंधान संस्थान (डीआरडीओ) के वैज्ञानिकों ने प्रतिभागी छात्र-छात्राओं को रक्षा उपकरणों के साथ ही महत्वपूर्ण हथियारों के बारे में जानकारी दी। डीआरडीओ से यहां पहुंचे वैज्ञानिक डा. जेपी सिंह और वैभव गुप्ता ने संयुक्त रूप से व्याख्यान देकर छात्रों को विज्ञान की नई-नई खोजों के लिए प्रेरित किया। मौके पर डीआरडीओ पर आधारित वृत्त चित्र का प्रदर्शन भी किया गया।

इससे पूर्व कार्यक्रम के प्रथम सत्र में प्रो. सीएम शर्मा तथा डा.आलोक गौतम ने छात्रों को रोचक जानकारियां दी। प्रो. शर्मा ने कार्बन उत्सर्जन को क्रमबद्ध तरीके से नियंत्रित किए जाने पर बल दिया।

जिससे भविष्य में हिमनदों के पिघलने की गति नियंत्रित की जा सके तथा तटीय समुद्री क्षेत्रों को डूबने से बचाया जा सके। डा.गौतम ने मौसम विज्ञान के क्षेत्र में भारत द्वारा की गई प्रगति के बारे में जानकारी दी। डा.राहुल बहुगुणा तथा वरूण ने क्विज श्रृंखला प्रस्तुत कर विजेता छात्र-छात्राओं को स्पॉट प्राइज दिया। कार्यक्रम संयोजक प्रो. प्रभाकर बडोनी, डा.सर्वेश उनियाल आदि मौके पर मौजूद रहे।

https://www.livehindustan.com/uttarakhand/srinagar/story-drdo-scientists-gave-important-information-to-the-students-5890864.html

DRDO on Twitter

25 February 2022

25 February 2022

DRDO @DRDO_India · 11h

Join the webinar on 'Aatmanirbharta In Defence - Call to Action'

Link for live view:

youtu.be/XUDCibtAA7Q

Register to join the conversation:
Session 1
bit.ly/MODBudget1
Session 2
bit.ly/MODBudget2

24 February 2022

DRDO @DRDO_India · 16h

Post budget 2022-23 webinar titled "Atmanirbharta In Defence : Call to Action" - at 10:30 hrs – 14:20 hrs on 25 February 2022. Hon'ble PM Shri Narendra Modi will deliver the inaugural address.
#AtmaNirbharBharatKaBudget
#AtmaNirbhartaInDefence

A. Bharat Bhushan Babu and 2 others

24 February 2022

24 February 2022

Defence News

Defence Strategic: National/International

Hindustan Times

Fri, 25 Feb 2022

No single service can win war on its own, says Indian Air Force Chief

The current theaterisation model to enhance tri-service synergy seeks to set up four integrated commands --- two land-centric theatres, an air defence command and a maritime theatre command.

Indian Air Force chief Air Chief Marshal Vivek Ram Chaudhari on Thursday said no single service can win wars on its own, and integration should focus on tapping into the strength of each service to maximise the country's combat capability.

Integration of the armed forces to enhance their effectiveness and reshape the conduct of future operations is a top priority for the government. While Chaudhari backed tri-service integration, he

stressed "the primacy of who will do what cannot be determined by a pro rata system of who has a larger mass of forces or equipment." The IAF chief was speaking on Aerospace Power: Future Challenges at the Jumbo Majumdar International Seminar.

"The thought process must change and it would be important to appreciate the capabilities of each service to make two plus two equal five," Chaudhari said. The IAF chief was driving home the point that the synergised effort should not be the sum of the whole but much more.

Indian Air Force chief Air Chief Marshal Vivek Ram Chaudhari on Thursday said no single service can win wars on its own, and integration should focus on tapping into the strength of each service. (HT PHOTO.)

Each service is equally important in its own domain and it's critical that the military is integrated in way that taps the operational capability of all the three services for the best outcome, said Air Marshal Anil Chopra (retd), director general, Centre for Air Power Studies.

India's first chief of defence staff (CDS) General Bipin Rawat, who was killed in a helicopter crash last December, was spearheading the theaterisation drive to best utilise the military's resources for future wars and operations. The government is yet to appoint his successor.

The current theaterisation model to enhance tri-service synergy seeks to set up four integrated commands --- two land-centric theatres, an air defence command and a maritime theatre command.

There is a need to develop joint command and control structures for integrated and synergised application of combat power, the IAF chief said. "The fundamental strengths of individual services must be brought together to deter potential enemies or decisively win the nation's wars. There is a need to wage tomorrow's wars with pragmatism and not necessarily idealism," he said.

He said the speed, reach and accuracy of air power made it a preferred choice for most operations, but it also needed to adapt to newer trends in war fighting.

The IAF chief flagged concerns about weaponisation of space. "China's latest demonstration of physically moving one of its disabled satellites into the graveyard orbit (in January) is bringing in newer threats in the race to weaponise the space domain, a domain hitherto considered relatively safe," he added.

https://www.hindustantimes.com/india-news/no-single-service-can-win-war-on-its-own-says-indian-air-force-chief-101645713475438.html

The Indian EXPRESS

Fri, 25 Feb 2022

China's move to weaponise space domain is bringing newer threats, says Air Force Chief

Space-based assets could become essential for the conduct of operations in a networked scenario in the future, the Air Chief Marshal said.

By Krishn Kaushik

New Delhi: Recent moves by China have weaponised the space domain, Indian Air Force Chief Air Chief Marshal V R Chaudhari said on Thursday, as he stated that terrestrial, space and aerial domains are losing their "individual identities" and the spectrum extends from small drones to hypersonic ballistic missiles.

Space-based assets could become essential for the conduct of operations in a networked scenario in the future, the Air Chief Marshal said.

Speaking at the Jumbo Majumdar International Seminar about the Future Challenges of Aerospace Power, Chaudhari said, "China's latest demonstration of physically moving one of its

disabled satellites into the graveyard orbit is bringing in newer threats in the race to weaponise the space domain, a domain hitherto considered relatively safe."

"The spectrum that we are looking at stretches from kinetic to non-kinetic, lethal to non-lethal and from small drones to hypersonic ballistic missiles. This vast and ever-changing continuum will pose significant challenges for the armed forces of the future."

Speaking about hypersonic missiles, which China tested last year, Chaudhari said, it is "launched from the surface of the earth, flies through the atmosphere into space and returns to a target on the earth with velocities far higher than any land and aerial platform. Similarly, as space-based assets become hubs for controlling terrestrial, underwater and aerial combat, they would also become centres of gravity which an adversary would like to target."

He asserted that "armed forces across the world have realised that the control of this vast continuum should rest with the air force."

Air Marshal VR Chaudhari (Photo: Twitter/@SpokespersonMoD)

Drones and miniature aerial vehicles and their proliferation "will pose a significant challenge for conventional air space control" and in the future, he said, "there would be teaming of manned and unmanned combat systems."

He said that space travel "has already become a reality" and "exponential growth in the civil aviation sector coupled with future developments in terrestrial travel will pose a huge problem in terms of air space control." This "conundrum" he said, should be addressed "before we get overtaken by technology."

Terrestrial, aerial and space-based systems, he said, "have now become a single entity bound by a common network and therefore also vulnerable to attacks" and while traditional land, sea and aerial warfare will always take place, "unconventional and hybrid means to disrupt conventional capability will need to be countered."

Chaudhari said that the growth of aviation over the last century "has been unparalleled and has revolutionised the character of warfare" and control of air "has become a prerequisite for the conduct of operations at all levels."

"Aerospace power continues to evolve and mutate, primarily fuelled by induction of new technology, the emergence of new threats and evolution of new paradigms for warfighting."

Talking about future challenges, he said that the foremost is technology and keeping pace with it, as "no other field has seen such a rapid transformation in technology as airpower has seen in the last 120 years of its existence." The technology in this domain is "niche, proprietary and often under tight state control" Chaudhari said, adding that "an associated challenge is to develop the capability for indigenous design, development and production of future capability."

He called for an "all of nation approach" as "no single entity will have the resources or the knowledge base to develop future battle-ready technology."

https://indianexpress.com/article/india/chinas-move-to-weaponise-space-domain-is-bringing-newer-threats-says-air-force-chief-7788658/

NBT
नवभारत टाइम्स

Fri, 25 Feb 2022

'चीन अंतरिक्ष में पैदा कर रहा हथियारों की होड़...' वायुसेना प्रमुख ने नए खतरे के बारे में चेताया

वायुसेना प्रमुख वी आर चौधरी ने एक नए खतरे की ओर इशारा किया है। यह है अंतरिक्ष के हथियारों से लैस होने का। हाल में चीन अपने निष्क्रिय उपग्रह को दूसरी कक्षा में ले गया था। इसके पहले सिर्फ अमेरिका ने ऐसा किया था। चौधरी ने सेना के तीनों अंगों में समन्वय पर भी जोर दिया है। उन्होंने कहा है कि इसके बगैर भविष्य में युद्ध नहीं जीते जा सकेंगे।

Edited by अमित शुक्ला

नई दिल्ली: चीन की ओर से अपने निष्क्रिय उपग्रह को दूसरी कक्षा में ले जाने के कार्य ने अंतरिक्ष के हथियारों से लैस होने का एक नया खतरा पैदा कर दिया है। वायुसेना प्रमुख वी आर चौधरी (IAF Chief VR Choudhari) ने गुरुवार को यह बात कही। उन्होंने कहा कि सेना के तीनों अंगों- वायुसेना, थल सेना या नौसेना (Air Force, Army and Navy) में से कोई भी एक बल सिर्फ अपने बूते युद्ध नहीं जीत सकता है और यह भविष्य के लिए भी अच्छा है।

वीआर चौधरी

पिछले महीने चीन के शिजियान-21 उपग्रह ने एक निष्क्रिय चीनी उपग्रह को उसकी जगह से स्थानांतरित कर दिया, जिससे उसकी भूस्थैतिक कक्षा बदल गई। किसी उपग्रह की कक्षाओं को भौतिक रूप से बदलने की यह क्षमता पहले केवल अमेरिका ने प्रदर्शित की थी।

वायु सेना प्रमुख ने कहा, 'अपने निष्क्रिय उपग्रहों में से एक को अन्य कक्षा में ले जाने का चीन का हालिया कार्य अंतरिक्ष को हथियारों से लैस करने की दौड़ में नए खतरे ला रहा है। यह ऐसा क्षेत्र है जिसे अब तक अपेक्षाकृत सुरक्षित माना जाता रहा है।'

उन्होंने कहा, 'हम जिस दायरे को देख रहे हैं, घातक से गैर-घातक और छोटे ड्रोन से लेकर हाइपरसोनिक बैलिस्टिक मिसाइलों तक फैला हुआ है। यह विशाल और निरंतर बदल रही स्थितियां भविष्य के सशस्त्र बलों के लिए महत्वपूर्ण चुनौतियां पेश करेगी।'

वायुसेना प्रमुख ने कहा कि भारतीय वायुसेना के प्रशिक्षण को आधुनिक, लचीला और अनुकूल बनाने की जरूरत है, जिसमें 'एकजुटता' का संदेश भी हो। उन्होंने कहा कि तकनीकी रूप से मजबूत अच्छी तरह से प्रशिक्षित वायु सैनिक, वायुसेना की शक्ति बढ़ाने का काम करेंगे।

उन्होंने कहा, 'कोई भी एक सेना सिर्फ अपने बूते युद्ध नहीं जीत सकती है और यह भविष्य के लिए भी अच्छा है। यह मुझे कमान और नियंत्रण की अगली चुनौती तक ले जाता है।'

https://navbharattimes.indiatimes.com/india/chinas-move-to-move-defunct-satellite-into-second-orbit-a-new-threat-air-force-chief/articleshow/89808856.cms?minitv=true

FINANCIAL EXPRESS
Read to Lead

Fri, 25 Feb 2022

China vs India technology equation

Since the intrusions began by the PLA, India did take some cosmetic actions of banning Chinese mobile apps, however, Indian Manufacturing is highly dependent on the raw materials.

By Lt Col Manoj K Channan

The world is witnessing a dynamic and fluid environment ever since the Wuhan Virus broke out in December 2019, the power struggle between the US and China are well documented and off late the Russian stand on Ukraine and its relationships with its immediate neighbour China and as India's neighbour Pakistan reaching out to Ukraine as well as reach out to Russia, to support it in the UN.

The Chinese are actively deploying 5G technology along the Line of Actual Control. India is still to roll out 5G technology and has limited capability in terms of a test laboratory which is only available at IIT Chennai. (File photo)

Closer to home the Chinese intrusions have been stalled by a strong response by the Indian Defence Forces and the Indian Army in particular which not only negated and gave a strong response along the line of actual control, including Galwan. The occupation of the Kailash Range put the PLA at a major disadvantage and exposed Moldo Garrison which came under direct line of sight and thus exposing the vulnerabilities of the PLA.

If one is to sit back and think that this gives India an edge, which will vary in areas of eye-to-eye contact.

Large scale conventional operations capability as well as capacity building stagnated under the mindset, of Counter Insurgency/ Counter Terror operations. The PLA intrusions as in 1962 have jolted the political, military and bureaucracy leadership out of its deep slumber.

Some tenets that need to be visited are being listed below for India to consider.

Commerce

Since the intrusions began by the PLA, India did take some cosmetic actions of banning Chinese mobile apps, however, Indian Manufacturing is highly dependent on the raw materials. Chinese companies have been delaying the supply chain and have changed the terms and conditions of the supply with imposed delays as well as a financial cost of hundred percent upfront.

Cyber Warfare/Security

China has a three-decade lead over India in its capabilities in offensive and defensive capacities to cause mayhem. The power breakdown at Mumbai was identified by US sources as a China-based cyber-attack, though its own CERT agency denied it as a breakdown under natural circumstances.

This morning Jawaharlal Nehru Port Container Terminal (JNPCT) is not accepting vessels alongside due to an outage of the system. A suspected cyber-attack of the management information system (MIS) has crippled the container terminal run by the state-owned port authority at Jawaharlal Nehru Port from Monday, forcing the Jawaharlal Nehru Container Terminal (JNPCT) to divert one container ship to other terminals at the port located near Mumbai.

5G Technology

The Chinese are actively deploying 5G technology along the Line of Actual Control. India is still to roll out 5G technology and has limited capability in terms of a test laboratory which is only available at IIT Chennai.

Big Data

Big Data is defined simply as large and voluminous complex data sets, arriving from new data sources that traditional data processing software cannot manage. In counter terrorism context, big data refers to the enormous amount of unstructured, unfiltered and raw data that law enforcement and intelligence agencies require to mine for information to prevent future attacks.

Artificial Intelligence and Machine Learning

The buzz words of Artificial Intelligence and Machine Learning are often heard at Seminars and talks delivered by Military leaders, it is still a long way to go, as technology adaptation has been delayed, as the focus has been on Counter Insurgency / Counter Terror operations that the Indian Army has been engaged in since October 1987, till date.

Hypersonic Technology Demonstrator Vehicle

An India-Russia joint venture, the BrahMos is considered the world's fastest supersonic cruise missile, which can fly at a speed of Mach 3, or three times the speed of sound. India has inducted this weapon for use on tri-services platforms.

Like the rest of the superpowers, India too has now joined the race to develop hypersonic weapons. The country has developed a hypersonic technology demonstrator vehicle (HSTDV) and tested a Mach 6 scramjet in June 2019 and in September 2020.

The HSTDV had been developed by India's Defence Research and Developmental Organisation (DRDO). According to experts, this test-firing was related to the making of the BrahMos II hypersonic missile. This new missile is likely to complement the Indian Navy's existing BrahMos anti-ship missile.

Hypersonic Cruise Missiles

3M22 Zircon – Hypersonic anti-ship cruise missile by Russia.

14-X – hypersonic glide vehicle mounted on a VSB-30 rocket by Brazil.

BrahMos-II – Hypersonic missile by India and Russia.

Hypersonic Technology Demonstrator Vehicle – Hypersonic scramjet demonstration by India.

High-Speed Strike Weapon – Boeing X-51 based missile by the United States.

Kh-90 – Hypersonic air-to-surface cruise missile. Developed in 1990 by the Soviet Union/ Russia.

DF-ZF – DF-17 mounted hypersonic glide vehicle by China.

Swarm Drone Capabilities

NewSpace Research & Technologies, which has won at least two contracts from the defence ministry in the last year, specialises in swarm drone systems and is working on an ambitious project with Hindustan Aeronautics Limited (HAL) to develop a cutting-edge pseudo satellite for surveillance and communications.

In September last year, the Army had placed a Rs 200 crore order on the company to deliver a swarm drone system that will be capable of surveillance and attack missions. Processed under the emergency purchases route, the system has to be delivered by the manufacturer within a year.

Loitering Precision Guided Munitions

General Atomics USA has been in negotiations with the Government of India, the supply of these highly versatile drones for precision targeting of hostile elements. Under the current Make in India initiative, it is pertinent that the Government of India engages with SMSEs and supports them after due diligence on their core competencies.

Conventional Arms Capabilities

The PLA with its larger industrial capabilities and surplus funds available has been able to plan and match its growth over the past few decades. India has been caught in its Gun vs Butter debate, lack of political will and vision and as on date lack of recruitment as the basic boots on ground, highly negate the military capability. Election rhetoric and lack of statesman leadership with weak leadership at all levels do not indicate any resolutions in the near future.

To sum up, it is never too late; all it takes is a planned approach and correct goal and expectation setting. Technology is ever evolving and the biggest challenges are the political and bureaucracy with endless trip wires of red tapeism, budget allocation and announcements for supporting indigenous development get lost out on lack of domain knowledge, lack of decision making, followed by re-appropriation of the budgets which meet political expediency are the root cause of being forever static, best described by Newton's first law of motion which states that an object in motion tends to stay in motion unless an external force acts upon it. Similarly, if the object is at rest, it will remain at rest unless an unbalanced force acts upon it. Newton's First Law of Motion is also known as the Law of Inertia.

(The author is an Indian Army Veteran. Views expressed are personal and do not reflect the official position or policy of Financial Express Online. Reproducing this content without permission is prohibited).

https://www.financialexpress.com/defence/china-vs-india-technology-equation/2444147/

The EurAsian Times

Fri, 25 Feb 2022

2nd biggest operator of submarine hunters, Indian Navy receives its 12th P-8I Poseidon Aircraft from Boeing

By Nitin J Ticku

Boeing delivered the 12th P-8I Poseidon maritime patrol aircraft to India, on February 23. This is the fourth of the four additional aircraft delivered under the options contract signed by the Ministry of Defence in 2016. Only the US operates more P-8Is than India.

"Customer centricity, commitment to the modernization and mission-readiness of India's defense forces are key values to our partnership with India," said Surendra Ahuja, managing director, Boeing Defence India.

"With this delivery of the P-8I maritime patrol aircraft, we continue to nurture this partnership and are fully committed to working closely with India's defense forces to deliver the right value and capabilities to meet their operational needs," Ahuja added.

Boeing P8I-Poseidon

The P-8I is an integral part of the Indian Navy's fleet and has surpassed 35,000 flight hours since it was inducted in 2013. The aircraft, with its exceptional maritime surveillance and reconnaissance capabilities, versatility and operational readiness, has proven to be an important asset to the Navy.

In addition to unmatched maritime reconnaissance and anti-submarine warfare capabilities, the P-8I has been deployed to assist during disaster relief and humanitarian missions.

The Indian Navy was the first international customer for the P-8 and today the P-8 is also operated by the US Navy, the Royal Australian Air Force, the United Kingdom's Royal Air Force and the Royal Norwegian Air Force.

Boeing remains committed in its efforts to further the 'Aatmanirbhar Bharat' (self-reliant India) vision for manufacture, sustainment and support of the Indian Navy's P-8I fleet. Boeing Defence India (BDI), Boeing's local entity in India, supports India's growing P-8I fleet by providing training to Indian Navy flight crews, spare parts, ground support equipment and field-service representative support.

Boeing's integrated logistics support has enabled a high state of fleet readiness at the lowest possible cost, the company said.

Several complex and mission-critical P-8I components such as the radar fingerprinting system, IFF (I/T) and datalink, speech secrecy system, mobile satcom system and wire harnesses are made in India by supplier partners, including Micro, Small & Medium Enterprises (MSMEs) located across the nation.

Boeing plans to enhance in-country technical services support for the P-8I fleet by leveraging the skills and expertise of Boeing's India Engineering and Technology Center, the aerospace giant said in a press release.

Boeing is also completing construction on the Training Support & Data Handling Centre at INS Rajali, Arakkonam, in Tamil Nadu, and a secondary center at the Naval Institute of Aeronautical Technology, Kochi, as part of a training-and-support package contract signed in 2019.

The indigenous, ground-based training will allow the Navy crew to increase mission proficiency in a shorter time while reducing the on-aircraft training time resulting in increased aircraft availability for mission tasking.

Indian Navy Expands

The Indian Navy is reportedly setting up a naval base in the remote Mauritian island of North Agalega and could operate its P-8 Poseidon from the facility, located in the south-western Indian Ocean.

As reported by The EurAsian Times in May last year, new satellite imagery showed changes in the physical features of the Indian infrastructure in Mauritius with an airfield and port development work being undertaken.

This work was believed to be worth more than $87 million. There has been a presence of the Indian military in Mauritius since 2015. Al Jazeera in its report claimed that it is a naval facility, and other military experts said that "an airstrip under construction will almost certainly be used for maritime patrol missions by India's Navy".

This infrastructure plan included the construction of a 3,000-m runway capable of handling the Indian Navy's P-8I Neptune Maritime Patrol Aircraft and a port that could host other surface vessels and potentially submarines, or other assets of strategic importance.

According to the Lowy Institute, this development was supposed to be in sync with the Modi government's 2016 vision for the Indian Ocean, articulated as Security and Growth for All in the Region (SAGAR). Under SAGAR, New Delhi planned to work together with Indian Ocean regional governments to "engineer virtuous cycles of cooperation".

Recently satellite pictures of Agalega, have emerged to depict the construction of two large jetties and a runway that is more than 3km (1.84 miles) long.

"It's an intelligence facility for India to stage air and naval presence in order to increase surveillance in the wider southwest Indian Ocean and Mozambique channel," Abhishek Mishra, associate fellow at the Observer Research Foundation (ORF) think-tank in New Delhi told Al Jazeera.

It's worth mentioning that India is set to acquire six more P-8I maritime patrol aircraft from the US. Developed by Boeing, the P8I is the Indian variant of the P-8A Poseidon multi-mission maritime aircraft. The P-8I planes are expected to replace the older fleet of the Tupolev Tu-142 aircraft.

To put these activities into context, the Chinese PLA Navy has been working firmly to be on par with the US military by 2027. The PLA navy possesses the largest surface fleet according to a US Congressional report published last year.

Beijing has been constructing military as well as commercial bases along the sea lines of communication (SLOCs), which extend from the Chinese mainland to Port Sudan in the Horn of Africa.

India's Plan to Checkmate China

Many commentators in India believe this plan, together with the China–Pakistan Economic Corridor, a part of China's Belt and Road Initiative, is a threat to India's national security. Such a system would encircle India and threaten its power projection, trade, and potentially territorial integrity.

China is on its way to creating a strong foothold in the Indian Ocean region with its elaborate naval bases, one that already exists in Djibouti, and the other long-expected one to be completed at Gwadar in Pakistan.

Wary of such developments, India is duly building and restoring its military presence pertaining to the naval assets/infrastructure in the region of the Indian Ocean.

Apart from Agalega, India also has its strategic listening post and radar facility in Madagascar and a coastal surveillance radar in Seychelles (whose existence is disputed and under shadows of secrecy and political controversies).

There is another listening post at Ras al Hadd. The Indian Navy has berthing rights at Muscat naval base, Oman. In 2018, New Delhi also secured access to facilities at the port city of Duqm in Oman for the Indian Air Force and the Indian Navy.

According to Samuel Bashfield, a researcher at the National Security College at the Australian National University, a port is being constructed at the north end of Agalega, which now includes accommodation for up to 430 Indian workers.

"The latest images show the original jetty in addition to the considerable port development (two longer jetties) stretching closer to the deep water," he said.

"This base on Agalega will cement India's presence in the south-west Indian Ocean and facilitate its power projection aspirations in this region. As new imagery of Agalega is publicly released in the coming months the full scale and capabilities of this facility will be better understood," Bashfield wrote for The Interpreter in March 2021.

https://eurasiantimes.com/2nd-biggest-operator-of-submarine-hunters-indian-navy-receives-its-12th-p-8i-poseidon-aircraft-from-boeing/

ORF OBSERVER RESEARCH FOUNDATION

Fri, 25 Feb 2022

A policy to replicate BrahMos' success

India's defence export policy did help in accelerating and convincing Manila about the merits of purchasing the BrahMos

By Harsh V. Pant, Kartik Bommakanti

India's defence exports have received a substantial boost with the recent sale of the naval variant of the BrahMos supersonic cruise missile to the Philippines. Exporting this cruise missile, which is a joint venture (JV) between India and Russia with 70 per cent indigenous input from India, is a significant milestone for Indian defence manufacturing. It is also significant that this sale to a key Southeast Asian country comes amidst considerable strategic churn in the Indo-Pacific.

It is driven as much by a strategic rationale as it is by commercial gains with the People's Republic of China (PRC) looming large in this purchase by the Philippines. Both Manila and Beijing claim islands in the South China Sea (SCS). Beijing has militarised the Woody Island, has been in a stand-off over the Scarborough Shoal with Manila and arbitrarily claimed the Nine Dash Line (NDL) which is a U-shaped line that Beijing believes is indisputable. The NDL covers 90 per cent of the waters in the SCS. Although there are multiple claimants to islands in the SCS, which is rich in fishing resources and energy reserves, the Philippines has doggedly confronted the PRC among all Southeast Asian countries.

The PRC's assertiveness over islands in the SCS and its efforts to constrain the Philippines naval missions and commercial shipping activity coupled with competing maritime claims over the islands explain Manila's decision to upgrade its defence capabilities.

Manila took the PRC over its maritime claims to the International Court of Arbitration at the Hague. Despite the International Court of Arbitration ruling in favour of the Philippines in 2016 under the United Nations Convention on the Laws of the Seas, China rejected the court's directives and jurisdiction, reflecting how international law is only customary and when confronted with the exercise of power by major states hardly has any effectiveness. The PRC's assertiveness over islands in the SCS and its efforts to constrain the Philippines naval missions and commercial shipping activity coupled with competing maritime claims over the islands explain Manila's decision to upgrade its defence capabilities.

The BrahMos contract is worth $375 million. India will be supplying three batteries of the shore-based anti-ship BrahMos missiles to the Philippine navy with the possibility of an additional order for the Philippines army for $300 million.

India's defence export policy did help in accelerating and convincing Manila about the merits of purchasing the BrahMos. Coordination between India's envoy to the Philippines and the former chief executive officer of BrahMos Aerospace Corporation led to Manila's decision to place the order. The successful sale of the BrahMos lies in the fact that India's research and development (R&D) and domestic manufacturing capacity have contributed significantly to improving the missile, though it had to take Moscow's consent before the sale could proceed. That apart, variants of the cruise missile are used across the service branches of the Indian military. This reflects considerable confidence in the performance of the missile, which has not gone unnoticed by external buyers such as the Philippines, but also potential buyers as is evidently the case with Indonesia. In addition to BrahMos, India's Hindustan Aeronautics Limited (HAL) has also developed the Advanced Light Helicopter (ALH), which is now under order from Mauritius. Variants of the ALH are used by the Indian Army (IA), the Indian Navy and Coast Guard, making it exportable.

The successful sale of the BrahMos lies in the fact that India's research and development (R&D) and domestic manufacturing capacity have contributed significantly to improving the missile, though it had to take Moscow's consent before the sale could proceed.

For long India has been— and still remains— one of the world's largest weapons importers. With these recent export successes, New Delhi stands on the cusp of starting to export greater volumes of defence hardware. According to the Ministry of Defence (MoD), India exported Rs 1,940 crore worth of defence equipment in 2014-15. In 2020-21, New Delhi's defence exports were at Rs 8,434 crore. These military exports consist of protective gear for military personnel, mechanical engineering equipment, and defence electronics. The MoD under the Narendra Modi government has set an ambitious defence export target of $5 billion by 2024.

Notwithstanding the success of the BrahMos, ALH and other military equipment over the last few years, the same cannot be said of the Tejas Light Combat Aircraft (LCA) or the Arjun Main Battle Tank (MBT). Despite the delivery of Arjun MBTs to the IA under instructions from the Government of India (GoI) and the IAF's procurement of 83 Tejas aircraft, again under GoI directives, these weapons platforms have yet to gain complete acceptance by the IA and the IAF. Absent significant commitment to a procurement programme by the Indian services for indigenously developed military hardware, the traction we witness today with defence exports will wither away. Prospective external buyers will remain unenthusiastic about purchasing Indian weapons systems, if it becomes visible that the Indian armed forces are tepid in inducting domestically-built hardware and do not intend to operate indigenous hardware for a sustained period of time.

Absent significant commitment to a procurement programme by the Indian services for indigenously developed military hardware, the traction we witness today with defence exports will wither away.

For a successful and sustainable defence export policy, India needs a multitude of stakeholders, encompassing the civilian leadership cutting across ideological lines, and across governments, the armed forces, R&D agencies and domestic manufacturers, working cohesively together. Without this, New Delhi's ambitions will still be confined to exporting mostly sub-systems and spares, notwithstanding its success with the BrahMos and the ALH.

The views expressed above belong to the author(s).

https://www.orfonline.org/research/a-policy-to-replicate-brahmos-success/

THE NEW INDIAN EXPRESS

Fri, 25 Feb 2022

40 countries to take part in Indian Navy's MILAN exercise; French, Lankan warships arrive

The latest edition of Indian Navy's multilateral exercise MILAN-2022 will witness participation of 40 countries.

Visakhapatnam: The latest edition of Indian Navy's multilateral exercise MILAN-2022 will witness participation of 40 countries. Scheduled to commence from Friday, the maritime exercise, being hosted in Visakhapatnam for the first time, was earlier supposed to take place in 2020, but was deferred due to the Covid pandemic.

Bangladesh Navy's Umar Farooq reaches Vizag on Thursday | G Satyanarayana

While 13 countries have sent their warships, others are sending their highest-level delegations. Warships of Vietnam, Myanmar, Malaysia, South Korea, Bangladesh, Indonesia US, Japan, Australia, Sri Lanka, Singapore, Seychelles and France will take part in the multi-nation exercise.

MIL AN will begin with a pre-launch event, 'ice-breaker', to be held at Eastern Naval Command-Sailors' Institute lawns. The event will provide an opportunity to officers of participating navies to interact with each other. The MILAN village at Sailors Institute houses handicraft and food stalls from reputed hotels featuring international and Indian cuisines to give all participants a fleeting glimpse of India during the exercise. It is being conducted over a duration of nine days in two phases with the harbour phase scheduled from February 25 to 28 and sea phase from March 1 to 4.

The MIL AN village also has curio/souvenir shops, for the visitors to take back memorabilia. There will be daily cultural performances to facilitate a healthy cultural exchange. The city parade is one of the major highlights of MILAN - 2022 and will be conducted on Feb 27 on the R K Beach road. Contingents from the Indian Navy, Indian Coast Guard, State police, Sea Cadet Corps, Naval Cadet Corps, schools from the city and friendly countries will participate in the parade. Cultural programme with tattoo ceremony by Indian Naval Band, hornpipe dance by cadets from Sea Cadet Corps and performance by artists/ schoolchildren, will add colour to the event. The RK Beach Road has been decked up for the spectacular show. Meanwhile, the Indian Navy welcomed naval ships of Vietnam, Sri Lanka and France which arrived here on Thursday.

https://www.newindianexpress.com/nation/2022/feb/25/40-countries-to-take-part-in-indian-navys-milan-exercise-french-lankan-warships-arrive-2423581.html

PHYS.ORG

Fri, 25 Feb 2022

Visualization of the origin of magnetic forces by atomic resolution electron microscopy

The joint development team of Professor Shibata (the University of Tokyo), JEOL Ltd. and Monash University succeeded in directly observing an atomic magnetic field, the origin of magnets (magnetic force), for the first time in the world. The observation was conducted using the newly developed Magnetic-field-free Atomic-Resolution STEM (MARS). This team had already succeeded in observing the electric field inside atoms for the first time in 2012. However, since the magnetic fields in atoms are extremely weak compared with electric fields, the technology to observe the magnetic fields had been unexplored since the development of electron microscopes. This is an epoch-making achievement that will rewrite the history of microscope development.

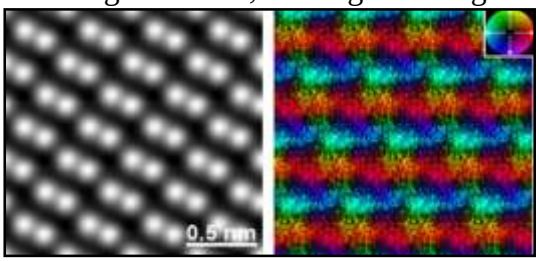

Figure 1. Real-space magnetic field image of an antiferromagnetic α-Fe2O3The atomic structure image (left) and corresponding magnetic field image (right). In the atomic structure image, Fe atoms are visualized as bright spots. In the magnetic field image, the color contrast indicates the magnetic field orientation and strength. The inset color wheel indicates how color and shade denote the magnetic field orientation and strength in the vector color map. The antiparallel magnetic fields on the adjacent Fe atomic layers are clearly observed, visualizing antiferromagnetic order in this crystal. Credit: Naoya Shibata

Electron microscopes have the highest spatial resolution among all currently used microscopes. However, in order to achieve ultra-high resolution so that atoms can be observed directly, we have to observe the sample by placing it in an extremely strong lens magnetic field. Therefore, atomic observation of magnetic materials that are strongly affected by the lens magnetic field such as magnets and steels had been impossible for many years. For this difficult problem, the team succeeded in developing a lens that has a completely new structure in 2019. Using this new lens, the team realized atomic observation of magnetic materials, which is not affected by the lens magnetic field. The team's next goal was to observe the magnetic fields of atoms, which are the origin of magnets (magnetic force), and they continued technological development to achieve the goal.

This time, the joint development team took on the challenge of observing the magnetic fields of iron (Fe) atoms in a hematite crystal (α-Fe_2O_3) by loading MARS with a newly developed high-sensitivity high-speed detector, and further using computer image processing technology. To observe the magnetic fields, they used the Differential Phase Contrast (DPC) method at atomic resolution, which is an ultrahigh-resolution local electromagnetic field measurement method using a scanning transmission electron microscope (STEM), developed by Professor Shibata et al. The results directly demonstrated that iron atoms themselves are small magnets (atomic magnet). The results also clarified the origin of magnetism (antiferromagnetism) exhibited by hematite at the atomic level. From the present research results, the observation on atomic magnetic field was demonstrated, and a method for observation of atomic magnetic fields was established. This method is expected to become a new measuring method in the future that will lead the research and development of various magnetic materials and devices such as magnets, steels, magnetic devices, magnetic memory, magnetic semiconductors, spintronics and topological materials.

More information: Yuji Kohno et al, Real-space visualization of intrinsic magnetic fields of an antiferromagnet, *Nature* (2022). DOI: 10.1038/s41586-021-04254-z

Journal information: *Nature*

https://phys.org/news/2022-02-visualization-magnetic-atomic-resolution-electron.html