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OrissaPOST

Fri, 25 June 2021

Nuclear capable subsonic cruise missile 'Nirbhay' successfully test-fired from ITR Chandipur

Balasore: India Thursday test-fired its subsonic cruise nuclear-capable missile Nirbhay with a range of 1000-km from the Integrated Test Range(ITR) at Chandipur off Odisha coast.

Defence Research and Development Organisation (DRDO) sources said the missile was test-fired at around 10:45am from the launch complex of III of the ITR.

Nirbhay missile is considered as Tomahawk of the United States and Babur missile of Pakistan.

Sources said the two-stage missile Nirbhay took a unique trajectory in its entire path to the target.

Being a terrain hugging missile, Nirbhay is difficult to detect by the enemy's radars. The missile keeps on encircling the area of its target for several minutes and then hits the 'bull's eye' at an opportune time, sources said.

The missile is capable of carrying multiple payloads and can engage several targets in a single flight. It could be launched from a surface lorry to a ship, from the air and even from underwater vessels.

The two-stage missile is first thrown vertically by using a booster engine and in the next stage, the second engine takes it to the target.

Nirbhay is equipped with a state of art seeker, that locks on the target to neutralise it most effectively.

The nuclear-capable, missile reaching speeds of 0.6-0.7 Mach and can strike land targets at a distance of up to 1,000 km.

DRDO sources said the missile can loiter and cruise at 0.7 Mach, at altitudes as low as 100 m.

The guidance, control and navigation system of the missile is configured around the indigenously designed Ring Laser Gyroscope (RLG) and MEMS-based Inertial Navigation System (INS) along with GPS.

https://www.orissapost.com/nuclear-capable-subsonic-cruise-missile-nirbhay-successfully-test-fired-from-itr-chandipur/

DEFENCE VIEW

Fri, 25 June 2021

India successfully test-fired nuclear capable cruise missile 'Nirbhay'

DRDO today successfully test-fired nuclear-capable subsonic cruise missile Nirbhay from the Integrated Test Range (ITR) at Chandipur of Odisha coast.

Having a range of 1500 KM, the missile was fired at 10.43 AM from launchpad no.3 of the Integrated Test Range at Chandipur of Balasore district.

Nirbhay is a subsonic cruise missile designed and developed by the Defence Research and Development Organisation (DRDO) under Ministry of Defence. The missile is capable of carrying nuclear warheads up to 200 kg. Made in India nuclear power! Nirbhay is an indigenously designed and developed long range sub-sonic cruise missile.

The DRDO has been carrying out several trials of Nirbhay since October 2014. Last year, the missile had developed technical snag during a test firing following which the trial process was aborted.

The Nirbhay is India's first indigenously produced cruise missile. The missile similar in appearance to the U.S. Tomahawk and the Russian Club SS-N-27 with its cylindrical fuselage.

Sources said the two-stage missile Nirbhay took a unique trajectory in its entire path to the target. Being a terrain hugging missile, Nirbhay is difficult to detect by the enemy's radars. The missile keeps on encircling the area of its target for several minutes and then hits the 'bull's eye' at an opportune time, sources said. The missile is capable of carrying multiple payloads and can engage several targets in a single flight. It could be launched from a surface lorry to a ship, from the air and even from underwater vessels.

The two-stage missile is first thrown vertically by using a booster engine and in the next stage, the second engine takes it to the target.

Nirbhay is equipped with a state of art seeker, that locks on the target to neutralise it most effectively.

With this test, India has also sent a stern message to Pakistan and China as the Nirbhay missile is capable of targetting any object within 1,000 km range. The Nirbhay missile is capable of loitering and cruising at 0.7 Mach at an altitude as low as 100 metres. It covered the designated target range in 42 minutes and 23 seconds.

The two-stage missile is 0.52 metre wide and 6 metre long. It has a wing span of 2.7 metre. The Nirbhay missile can carry warheads at a speed of 0.6 to 0.7 Mach. During the launch time, its launch weight was around 1500 kg.

https://defenceview.in/india-successfully-test-fired-nuclear-capable-cruise-missile-nirbhay/

Fri, 25 June 2021

CM congratulates DRDO for successful launch of missile 'Nirbhay' off Odisha Coast

Bhubaneswar: Odisha chief minister Naveen Patnaik on Thursday congratulated DRDO on the successful launch of subsonic cruise missile 'Nirbhay' from Integrated Test Range off the coast of Odisha.

It is to be noted that subsonic cruise missile 'Nirbhay' today test-fired its subsonic cruise nuclear-capable missile Nirbhay with a range of 1000-km from the Integrated Test Range(ITR) at Chandipur off Odisha coast.

As per reports the missile was test-fired at around 1045 hrs from the launch complex of III of the ITR.

https://kalingatv.com/state/cm-congratulates-drdo-for-successful-launch-of-missile-nirbhay-off-odisha-coast/

Fri, 25 June 2021

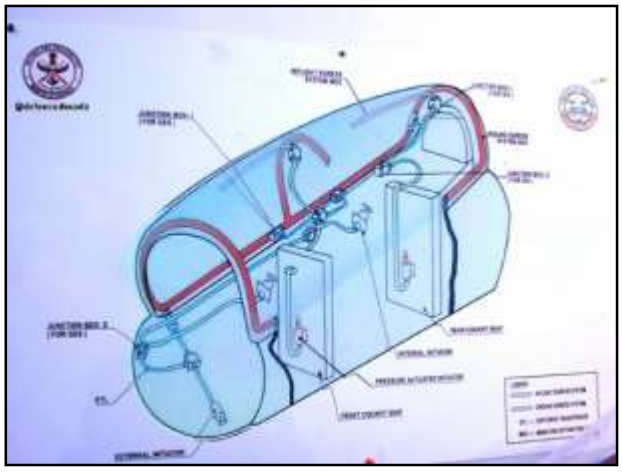
Explained: Canopy Severance System (CSS) for fighter aircraft developed by DRDO facility

DRDO's facility in Pune called Armament Research and Development Establishment or ARDE has developed a canopy severance system for combat aircrafts mainly Tejas in India. Take a look at the details below

By Tulika Tandon

Canopy Severance System (CSS): Why in the news?

India has its own canopy severance system (CSS) that has been developed by Armament Research and Development Establishment (ARDE), Pune, DRDO in association with High Energy Material Research Laboratory. It has been indigenously developed for LCA Tejas and Trainer Aircraft, HJT-36 and HTT-40.



What is a Canopy Severance System?

1. Canopy Severance System is an escape path clearance system that is used by the pilots in case of emergencies happening while flying.
2. It also provides a safe passage by pre weakening/ severing the canopy to facilitate the smooth escape of the pilot as soon as possible.
3. This is a life saving system of a fighter aircraft helping it to safely eject pilots at the time of need. Two major components required for functioning of CSS are
4. MDC for cutting the bubble of canopy
5. Explosive Transfer Line (ETL) for transmission of explosive shock from one point to another.
6. MDC and ETL function with a velocity of detonation of 6000 m/s ensuring that the cutting action of the Canopy occurs in less than 5 m sec from the time of initiation

In the picture below, one can see the features of canopy on LCA Tejas:

About Indegenious CSS:

1. The CSS project for LCA Tejas and its trainer aircraft was tested successfully in London and Moscow
2. The GOCL has already supplied eight units of the CSS after fulfilling qualification and functional tests
3. All aircraft are undergoing test flights with CSS
4. LCA TD-1,TD-2 and PV-1 have been assembled with indigenous CSS

How does the Canopy Severance System Work?

CSS works on the principle of controlled propagation of detonation using explosive mechanical energy. It consists of critical mechanical and explosive components that may be apt for military grade devices and be reliable enough.

The subsystems of Canopy Severance System have two independent subsystems:

i) In Flight Egress System

ii) Ground Egress System

What is an In- Flight Egress System?

The In Flight Egress System is useful for in-flight emergencies. It is integrated with main escape system operation and with seat ejection operation. Take a look at the picture to completely understand.

What is the Ground Egress System?

The Ground Egress System is for on-ground emergencies and is majorly independent of the main escape system and also of seat ejection.

https://www.jagranjosh.com/general-knowledge/explained-canopy-severance-system-for-fighter-aircraft-developed-by-drdo-facility-1624535055-1

नवभारत टाइम्स

Fri, 25 June 2021

अग्नि सीरीज की सबसे एडवांस मिसाइल का टेस्ट करेगा भारत, जानें क्या है 'अग्नि प्राइम' की खासियत

भारत अगले सप्ताह ओडिशा में अग्नि सीरिज के सबसे एंडवास मिसाइल अग्नि प्राइम का टेस्ट करने जा रहा है। इस मिसाइल को रक्षा अनुसंधान एवं विकास संगठन (DRDO) ने डेवलप किया है।

By Anil Kumar

हाइलाइट्स:

- ***28-29 जून को नई मिसाइल का परीक्षण ओडिशा तट पर किये जाने की तैयारी***
- ***अग्नि-4 और अग्नि-5 मिसाइलों वाली अत्याधुनिक तकनीकों को किया है शामिल***
- ***मध्यम दूरी की बैलेस्टिक मिसाइल अग्नि- I का पहला परीक्षण 1989 में हुआ था***

नई दिल्ली: देश में अगले सप्ताह अग्नि सीरीज के सबसे एडवांस वर्जन अग्नि प्राइम का टेस्ट हो सकता है। रक्षा अनुसंधान एवं विकास संगठन (DRDO) ने इस मिसाइल को विकसित किया है। अत्याधुनिक अग्नि प्राइम को 4,000 किलोमीटर की रेंज वाली अग्नि-4 और 5,000 किलोमीटर की अग्नि-5 मिसाइलों में इस्तेमाल होने वाली अत्याधुनिक तकनीकों को मिलाकर डेवलप किया गया है। न्यू इंडियन एक्सप्रेस की खबर के अनुसार अग्नि प्राइम मिसाइल की स्ट्राइक रेंज 1000 से 1500 किलोमीटर के बीच होगी।

ये हैं भारत की खतरनाक मिसाइलें

मोबाइल लॉन्चर से भी किया जा सकेगा फायर

दो स्टेज और सॉलिड फ्यूल पर आधारित अग्नि प्राइम मिसाइल को एडवांस रिंग-लेजर गायरोस्कोप पर आधारित जड़त्वीय नेविगेशन सिस्टम द्वारा निर्देशित किया जाएगा। दोनों चरणों में समग्र रॉकेट मोटर्स हैं। इसका गाइडेंस सिस्टम इलेक्ट्रोमैकेनिकल एक्ट्यूएटर्स से लैस हैं। रक्षा विभाग से जुड़े सूत्रों के अनुसार सिंगल स्टेज वाले अग्नि-I के विपरीत, डबल स्टेज वाले अग्नि प्राइम फ्लैक्सिबिलिटी के साथ सड़क और मोबाइल लॉन्चर दोनों से फायर किया जा सकता है।

स्लीक डिजाइन, अधिक मारक क्षमता

एक अधिकारी ने मिसाइल से जुड़े डिटेल की अधिक जानकारी देने से इनकार करते हुए कहा कि अग्नि प्राइम में अत्याधुनिक तकनीक के प्रयोग के कारण यह पिछले एडिशन की तुलना में कम वजन वाली स्लीक मिसाइल शक्ति है। इससे इसकी मारक क्षमता पहले तुलना में अधिक घातक होगी।

1989 में हुआ था अग्नि-1 का टेस्ट

भारत ने मई 1989 में पहली बार मध्यम दूरी की बैलेस्टिक मिसाइल अग्नि-1 का टेस्ट किया था। उस समय इसकी मारक क्षमता 700 से 900 किलोमीटर थी। इसे साल 2004 में सेना में शामिल किया गया था। यदि अग्नि प्राइम का टेस्ट सफल रहता है तो यह अग्नि-1 की जगह ले लेगी। भारत अग्नि सीरिज की पांच मिसाइल विकसित कर चुका है।

https://navbharattimes.indiatimes.com/india/drdo-ready-for-test-of-new-agni-series-missile-agni-prime-early-next-week/articleshow/83831276.cms

COVID 19: DRDO's Contribution

जागरण

Fri, 25 June 2021

बरेली के महिला अस्पताल में डीआरडीओ लगाएगा आक्सीजन प्लांट, भारतीय राष्ट्रीय राजमार्ग प्राधिकरण की टीम ने किया निरीक्षण

महिला अस्पताल में भी लगेगा प्लांट Oxygen Plant News तीन सौ बेड अस्पताल में आक्सीजन Oxygen Plant News जेनरेशन प्लांट लगाने के बाद अब रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) जिला महिला अस्पताल में भी आक्सीजन प्लांट लगाएगा। इसके लिए एनएचएआइ की टीम ने निरीक्षण किया।

By Ravi Mishra

बरेली: तीन सौ बेड अस्पताल में आक्सीजन जेनरेशन प्लांट लगाने के बाद अब रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) जिला महिला अस्पताल में भी आक्सीजन प्लांट लगाएगा। इसके लिए भारतीय राष्ट्रीय राजमार्ग प्राधिकरण (एनएचएआइ) की टीम ने महिला अस्पताल का निरीक्षण किया है। तीन सौ बेड अस्पताल के लिए स्वीकृत दूसरा प्लांट जिला अस्पताल में शिफ्ट होने की संभावना जताई जा रही है।

कोरोना की दूसरी लहर के दौरान जब मेडिकल आक्सीजन की बेतहाशा जरूरत पड़ी तो शासन ने तीन सौ बेड के अस्पताल में दो आक्सीजन जेनरेशन प्लांट लगाने के निर्देश दिए थे। एक प्लांट मेडिकल कारपोरेशन और दूसरी पीएम रिलीफ फंड से लगाया जाना थे। पीएम रिलीफ फंड से लगने वाले प्लांट डीआरडीओ ने तीन सौ बेड अस्पताल में लगा दिया है।

इसकी क्षमता एक हजार लीटर प्रति मिनट आक्सीजन सप्लाई करने की है। वहां सेंक्शन हुआ दूसरा आक्सीजन प्लांट जिला अस्पताल में शिफ्ट होने की संभावना है।

मंडलीय अपर निदेशक एवं प्रमुख अधीक्षक डा. सुबोध शर्मा ने आक्सीजन जेनरेशन प्लांट लगाने की मांग शासन से की है। इधर, अब जिला महिला अस्पताल में भी आक्सीजन जेनरेशन प्लांट लगने की तैयारी की जा रही है। एनएचएआइ की टीम ने बुधवार को वहां प्लांट लगाने के लिए जगह चिह्नित की। पुराने एक्स-रे डिपार्टमेंट के सामने खाली जगह पर प्लांट लगाने की सहमति बनी। वहां करीब पांच सौ लीटर प्रति मिनट की सप्लाई वाला प्लांट लगने की संभावना है। इसके साथ ही अन्य स्थान भी टीम ने देखी है।

तीन सौ बेड अस्पताल में आक्सीजन जेनरेशन प्लांट लग गया है। वहां एक अन्य प्लांट भी सेंक्शन है। इसके साथ ही जिला महिला अस्पताल में पांच सौ लीटर प्रति मिनट आक्सीजन सप्लाई की क्षमता वाला प्लांट लगाने की तैयारी है। यह प्लांट भी डीआरडीओ लगाएगा। इसके लिए एनएचएआइ ने भूमि का सर्वे कर लिया है। -डा. सुधीर कुमार गर्ग, सीएमओ

https://www.jagran.com/uttar-pradesh/bareilly-city-oxygen-plant-news-drdo-will-set-up-oxygen-plant-in-bareilly-womens-hospital-national-highway-authority-of-india-team-inspected-21770589.html

NEWS LIVE
PUSHING NORTH EAST 24x7

Fri, 25 June 2021

Sarusajai Covid 19 hospital opens for patients

Guwahati: The Sarusajai COVID19 hospital is now open for the patients. Built-in a record time by the Defense Research and Development Organisation (DRDO), the 316-bedded hospital is specially dedicated to fighting COVID19.

The hospital opened its services for COVID19 patients from Wednesday with its first two patients. It has the required equipment to treat COVID19 patients with oxygen supply to all the beds.

As the COVID19 situation has improved in Guwahati, from Thursday, MMCH, Ayurvedic Hospital and Singimari Hospital have stopped attending to COVID19 infected patients. All COVID19 patients will now be treated in the new Sarusajai COVID19 Hospital.

In Assam, the COVID19 situation is improving and the good news is, the infection rate is coming down and the recovery rate is moving up.

https://newslivetv.com/sarusajai-covid19-hospital-opens-for-patients/

जागरण

Fri, 25 June 2021

लखनऊ में अगले आदेश तक DRDO Covid अस्पताल बंद, अपने बेस में वापस लौटे सैन्य चिकित्सक

पिछले कई दिनों से कोविड संक्रमित रोगियों की संख्या में भारी कमी आने के बाद शहर के अन्य अस्पतालों की तरह इस अस्थायी अस्पताल में सन्नाटा होने लगा जबकि जिन अस्पतालों से यह डाक्टर मिलिट्री नर्सिंग सर्विस अधिकारी व पैरामेडिकल स्टाफ आया था वहां मरीजों की संख्या बढ़ने लगी।

By Anurag Gupta

लखनऊ: कोरोना की दूसरी लहर थमने के बाद अवध शिल्प ग्राम स्थित डीआरडीओ के अस्थायी कोविड अस्पताल में सन्नाटा छा गया है। यहां पिछले कई दिनों से एक भी कोरोना संक्रमित मरीज भर्ती नहीं हुआ हैं। ऐसे में इस अस्थायी कोविड अस्पताल को अगले आदेश तक बंद करने का निर्णय लिया गया है। अस्पताल में मौजूदा दो आइसीयू व दो जनरल वार्ड के साथ आक्सीजन प्लांट व पूरा सेटअप बरकरार रहेगा, जिसे संभावित तीसरी लहर में जरूरत पडऩे पर तीन दिन के भीतर दोबारा शुरू किया जा सके। इस बीच देश भर से आए सैन्य डाक्टर, मिलिट्री नर्सिंग सर्विस अधिकारी व पैरामेडिकल स्टाफ अपने पूर्व के तैनाती स्थलों पर वापस जाने लगे हैं।

डीआरडीओ ने दिल्ली के बाद देश का दूसरा अस्थायी कोविड अस्पताल अवध शिल्प ग्राम में बनाया था। डीआरडीओ की टीम 17 अप्रैल को लखनऊ आई थी और 28 अप्रैल तक 155 वेंटीलेटर बेड वाला आइसीयू व 355 बेड का आक्सीजन आपूर्ति वाले दो जनरल वार्ड तैयार किए। इसमें तीन वार्ड स्थायी प्रदर्शनी हाल में, जबकि एक जनरल वार्ड जर्मन हैंगर में बनाया गया। यहां 20 हजार लीटर के दो लिक्विड आक्सीजन टैंक भी लगाए गए हैं। इस अस्पताल में 36 डाक्टरों, 80 मिलिट्री नर्सिंग सर्विस अधिकारियों और 150 पैरामेडिकल स्टाफ सहित 300 से अधिक लोगों की तैनाती की गई थी।

मुख्यमंत्री योगी आदित्यनाथ ने पांच मई को अस्पताल का लोकार्पण किया था। हालांकि पिछले कई दिनों से कोविड संक्रमित रोगियों की संख्या में भारी कमी आने के बाद शहर के अन्य अस्पतालों की तरह इस अस्थायी अस्पताल में सन्नाटा होने लगा, जबकि जिन अस्पतालों से यह डाक्टर, मिलिट्री नर्सिंग सर्विस अधिकारी व पैरामेडिकल स्टाफ आया था वहां नॉन कोविड मरीजों की संख्या बढऩे लगी। ऐसे में इनको अपने पुराने तैनाती स्थलों पर भेजने का आदेश हुआ। अस्पताल प्रशासन ने सीएमओ को पत्र लिखकर यहां नॉन कोविड मरीजों को भेजने को कहा था, लेकिन उस पर भी कोई निर्णय नहीं हुआ। सीएमओ की ओर से अस्थायी अस्पताल को अगले आदेश तक बंद करने के दिशा निर्देश जारी कर दिए गए हैं। सीएमओ ने बताया कि अस्पताल के मौजूदा स्वरूप को बरकरार रखा जाएगा। सभी मशीनें सुरक्षित रहेंगी। केवल यहां तैनात स्टाफ जा रहा है। भविष्य में जरूरत पडऩे पर अस्पताल दोबारा शुरू हो सकेगा।

https://www.jagran.com/uttar-pradesh/lucknow-city-drdo-covid-hospital-closed-in-lucknow-till-further-orders-21769350.html

DRDO on Twitter

Defence News

Defence Strategic: National/International

Press Information Bureau
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Ministry of Defence

Thu, 24 June 2021 5:44PM

Raksha Mantri Shri Rajnath Singh reviews development works at Karwar Naval Base under 'Project Seabird';

RM says it will be Asia's largest Naval Base and further strengthen the operational readiness of the Armed Forces

Raksha Mantri Shri Rajnath Singh visited the Karwar Naval Base in Karnataka on June 24, 2021 to review the progress of ongoing infrastructure development under 'Project Seabird'. Accompanied by Chief of the Naval Staff Admiral Karambir Singh, Shri Rajnath Singh undertook an aerial survey of the Project Area and Sites before arriving at the INS Kadamba Heli Pad. The visiting dignitaries were received by Flag Officer Commanding in Chief, Western Naval Command Vice Admiral R Hari Kumar and Flag Officer Commanding Karnataka Naval Area, Rear Admiral Mahesh Singh.

The Raksha Mantri inspected the ongoing works at the Naval Base and received on-site briefings including capability demonstration at the Shiplift Tower. He also undertook a tour of the Naval Harbour and reviewed the marine works/infrastructure being developed as part of Project Seabird Phase II A as also operationalisation of Piers. Shri Rajnath Singh visited the newly-constructed Sailors Married Accommodation which incorporates advanced features for water efficiency, handling of house-hold waste, energy efficiency and provides environment-friendly houses.

Shri Rajnath Singh interacted with Project Seabird Contactors & Engineers and Officers, Sailors & Civilians of Karwar Naval Base. In his address, he expressed satisfaction at the progress of works being carried out under 'Project Seabird'. He hoped that after the completion of the project, the Kawar Naval Base would become Asia's largest Naval base which would further bolster the operational readiness of the Armed Forces and help in augmenting trade, economy & humanitarian aid operations.

The Raksha Mantri complimented the Indian Navy for being a strong arm of the Armed Forces that is making an invaluable contribution towards maritime and national security, besides strengthening India's position at the strategic as well as diplomatic & commercial levels. He stated that the Navy is successfully discharging its duties of protecting the country, which through its coastline of more than 7,500 kms, about 1,300 islands and an exclusive economic zone of 2.5 million sq kms, is playing a crucial role in the development of the world. Shri Rajnath Singh added that the Navy is continuously strengthening India's relations with its maritime neighbours with focus on 'SAGAR' (Security & Growth for All in Region) envisioned by Prime Minister Shri Narendra Modi. He also praised the role of Indian Navy during Goa Liberation War of 1961 and the 1971 Indo-Pak war among others.

Shri Rajnath Singh lauded the efforts of Indian Navy for providing humanitarian assistance to not just the country, but the world, especially during the COVID-19 pandemic. “From rescuing stranded Indian nationals from affected countries to ferrying in critical equipment, including oxygen cylinders, from abroad, Indian Navy has worked tirelessly in the fight against COVID-19. It also extended assistance to various countries,” he said.

The Raksha Mantri also highlighted some of the reforms undertaken by the Government to further strengthen the operational preparedness of the Armed Forces, including appointment of Chief of Defence Staff and setting up of Department of Military Affairs in Ministry of Defence. He also listed out a number of initiatives taken by the Government to promote self reliance in defence manufacturing. The initiatives include allocation of 64 per cent of modernisation funds under capital acquisition budget for 2021-22 for domestic procurement; changes in Defence Acquisition Procedure 2020 and increase in FDI limit in the defence sector to 74 per cent.

On the efforts to boost self reliance in Indian Navy, Shri Rajnath Singh said more than two-thirds of Navy's modernisation budget has been spent on indigenous procurement in the last five financial years. Lauding Navy’s commitment towards ‘AatmaNirbhar Bharat’, he stated that out of the 48 ships and submarines, 46 are being inducted through indigenous construction. The Raksha Mantri described Indigenous Aircraft Carrier Vikrant as a shining example of Navy's self-reliance efforts. He said the commissioning of Indigenous Aircraft Carrier Vikrant will be a momentous occasion in the history of Indian defence as it is coinciding with the 75th anniversary of India’s Independence. He expressed confidence that Indian Navy will become one of the top three Navies in the world in the coming years and continue to play a crucial role in protecting the nation.

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पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Thu, 24 June 2021 5:44PM

रक्षा मंत्री श्री राजनाथ सिंह ने 'प्रोजेक्ट सीबर्ड' के तहत कारवार नौसेना अड्डे पर विकास कार्यों की समीक्षा की

रक्षा मंत्री ने कहा कि यह एशिया का सबसे बड़ा नौसैनिक अड्डा होगा और सशस्त्र बलों की सैन्य अभियान संबंधी तैयारी को और मजबूत करेगा

रक्षा मंत्री श्री राजनाथ सिंह ने 24 जून, 2021 को कर्नाटक के कारवार नौसेना अड्डे का दौरा कर 'प्रोजेक्ट सीबर्ड' के तहत जारी ढांचागत निर्माण के विकास की प्रगति की समीक्षा की। नौसेना प्रमुख एडमिरल करमबीर सिंह के साथ श्री राजनाथ सिंह ने आईएनएस कदंब हेली पैड पर पहुंचने से पहले परियोजना क्षेत्र और सबंधित स्थलों का हवाई सर्वेक्षण किया। दौरे में शामिल अतिथियों का स्वागत पश्चिमी नौसेना कमान के फ्लैग ऑफिसर कमांडिंग इन चीफ वाइस एडमिरल आर हरि कुमार और कर्नाटक नेवल एरिया के फ्लैग ऑफिसर कमांडिंग रीयर एडमिरल महेश सिंह ने किया।

रक्षा मंत्री ने नौसेनिक अड्डे पर चल रहे कार्यों का निरीक्षण किया और शिपलिफ्ट टॉवर में क्षमता प्रदर्शन सहित प्रोजेक्ट स्थल से जुड़ी ब्रीफिंग प्राप्त की। उन्होंने नौसेना हार्बर का दौरा भी किया और परियोजना सीबर्ड फेज II ए के हिस्से के रूप में विकसित किए जा रहे समुद्री कार्यों/ बुनियादी ढांचे की

समीक्षा की और साथ ही पियर्स के परिचालन की भी समीक्षा की। श्री राजनाथ सिंह ने नवनिर्मित सैलर्स मैरिड एकोमोडेशन का दौरा किया जिसमें जल दक्षता, घरेलू कचरे की हैंडलिंग, ऊर्जा दक्षता के आधुनिक तौर तरीक़े शामिल हैं तथा यह पर्यावरण अनुकूल आवास मुहैया कराता है।

श्री राजनाथ सिंह ने कारवार नौसेना अड्डे के प्रोजेक्ट सीबर्ड संपर्क कर्ताओं और इंजीनियरों एवं अधिकारियों, नाविकों और नागरिकों के साथ बातचीत की। अपने संबोधन में उन्होंने 'प्रोजेक्ट सीबर्ड' के तहत किए जा रहे कार्यों की प्रगति पर संतोष व्यक्त किया। उन्होंने आशा व्यक्त की कि इस परियोजना के पूरा होने के बाद कारवार नौसैनिक अड्डा एशिया का सबसे बड़ा नौसैनिक अड्डा बन जाएगा जो सशस्त्र बलों की सैन्य अभियान सम्बंधी तैयारी को और मजबूत करेगा और व्यापार, अर्थव्यवस्था और मानवीय सहायता अभियानों को बढ़ाने में मदद करेगा।

रक्षा मंत्री ने भारतीय नौसेना की, सामरिक और कूटनीतिक तथा वाणिज्यिक स्तरों पर भारत की स्थिति को मजबूत करने के अलावा समुद्री और राष्ट्रीय सुरक्षा में अमूल्य योगदान देने वाली सशस्त्र सेनाओं की मजबूत शाखा होने के लिए, सराहना की। उन्होंने कहा कि नौसेना देश की रक्षा के अपने कर्तव्यों का सफलतापूर्वक निर्वहन कर रही है, जो देश 7500 किलोमीटर से अधिक के अपने समुद्र तट, लगभग 1300 द्वीपों और 2.5 मिलियन वर्ग किलोमीटर के आर्थिक क्षेत्र के माध्यम से दुनिया के विकास में महत्वपूर्ण भूमिका निभा रहा है। श्री राजनाथ सिंह ने कहा कि नौसेना प्रधानमंत्री श्री नरेन्द्र मोदी के दृष्टिकोण के अनुरूप सागर (सिक्योरिटी एंड ग्रोथ फ़ॉर ऑल इन द रीजन) पर ध्यान केंद्रित करते हुए समुद्री पड़ोसियों के साथ भारत के संबंधों को लगातार मजबूत कर रही है। उन्होंने 1961 के गोवा मुक्ति संग्राम और 1971 के भारत-पाक युद्ध के दौरान भारतीय नौसेना की भूमिका की भी प्रशंसा की।

श्री राजनाथ सिंह ने विशेष रूप से कोविड-19 महामारी के दौरान न केवल देश, बल्कि विश्व को मानवीय सहायता प्रदान करने के लिए भारतीय नौसेना के प्रयासों की सराहना की । उन्होंने कहा कि "प्रभावित देशों से फंसे भारतीय नागरिकों को बचाने से लेकर विदेशों से ऑक्सीजन सिलेंडर सहित महत्वपूर्ण उपकरणों को लाने ले जाने तक, भारतीय नौसेना ने कोविड-19 के खिलाफ लड़ाई में अथक परिश्रम किया है। नौसेना ने विभिन्न देशों को सहायता भी प्रदान की।"

रक्षा मंत्री ने रक्षा मंत्रालय में चीफ ऑफ डिफेन्स स्टाफ की नियुक्ति और सैन्य मामलों के विभाग की स्थापना सहित सशस्त्र बलों की सैन्य तैयारियों को और मजबूत करने के लिए सरकार द्वारा किए गए कुछ सुधारों पर भी प्रकाश डाला। उन्होंने रक्षा विनिर्माण में आत्मनिर्भरता को बढ़ावा देने के लिए सरकार द्वारा उठाई गई कई पहलों को भी सूचीबद्ध किया। इन पहलों में घरेलू खरीद के लिए 2021-22 के लिए पूंजी अधिग्रहण बजट के तहत आधुनिकीकरण निधि का 64 प्रतिशत आवंटन, रक्षा अधिग्रहण प्रक्रिया 2020 में बदलाव और रक्षा क्षेत्र में एफडीआई की सीमा बढ़ाकर 74 प्रतिशत करना शामिल है।

भारतीय नौसेना में आत्मनिर्भरता बढ़ाने के प्रयासों के बारे में श्री राजनाथ सिंह ने कहा कि नौसेना के आधुनिकीकरण बजट का दो तिहाई से अधिक पिछले पांच वित्तीय वर्षों में स्वदेशी खरीद पर खर्च किया गया है। 'आत्मनिर्भर भारत' के प्रति नौसेना की प्रतिबद्धता की सराहना करते हुए उन्होंने कहा कि 48 जहाजों और पनडुब्बियों में से 46 को स्वदेशी निर्माण के माध्यम से नौसेना में शामिल किया जा रहा है। रक्षा मंत्री ने स्वदेशी विमानवाहक पोत विक्रांत को नौसेना के आत्मनिर्भरता के प्रयासों का जीता जागता उदाहरण बताया। उन्होंने कहा कि स्वदेशी विमानवाहक पोत विक्रांत का नौसेना में कमीशन होना भारतीय रक्षा के इतिहास में एक महत्वपूर्ण अवसर होगा क्योंकि यह भारत की स्वतंत्रता की 75वीं वर्षगांठ के समय के साथ होना है। उन्होंने विश्वास व्यक्त किया कि भारतीय नौसेना आने वाले वर्षों में दुनिया की शीर्ष तीन नौसेनाओं में से एक बन जाएगी और राष्ट्र की रक्षा में महत्वपूर्ण भूमिका निभाती रहेगी।

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FINANCIAL EXPRESS
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Fri, 25 June 2021

Army Chiefs of India, Kazakhstan hold telephonic interaction on bilateral defence cooperation

Kazakhstan shares land border of around 1,780 km with China. However, unlike India, Kazakhstan does not have any active border dispute with China

Indian Army Chief General M M Naravane on Thursday held a telephonic interaction with his counterpart in Kazakhstan Major General Talgat Mamyrtaevich Koibakov to discuss issues of bilateral defence cooperation, according to an official statement.

Indian Army Chief General M M

Kazakhstan shares land border of around 1,780 km with China. However, unlike India, Kazakhstan does not have any active border dispute with China.

It has been more than a year since the military standoff between the armies of India and China erupted in eastern Ladakh on May 5, 2020, during which there were fatalities on both sides for the first time in 45 years.

India and China have made limited progress in achieving disengagement in the Pangong lake area while negotiations for similar steps at other friction points continue. Indian Army said on Twitter on Thursday, "General MM Naravane, COAS (Chief of Army Staff), had telephonic interaction with Major General Talgat Mamyrtaevich Koibakov, Commander-in-Chief, Land Forces of the Armed Forces, Republic of #Kazakhstan and discussed issues of bilateral defence cooperation."

https://www.financialexpress.com/defence/army-chiefs-of-india-kazakhstan-hold-telephonic-interaction-on-bilateral-defence-cooperation/2277870/

THE TIMES OF INDIA

Fri, 25 June 2021

Army reviews work on patrol vessels

Panaji: With Goa Shipyard Limited (GSL) preparing to deliver the Indian Army's first high performance specialised boat to patrol the Pangong Tso lake in eastern Ladakh, a delegation of Indian Army officials arrived for the pre-delivery demonstration.

According to GSL, the Indian Army delegation also discussed future requirements of hovercrafts and interceptor boats to patrol sensitive and strategic areas.

GSL, which bagged the a Rs 65 crore order to construct 12 specialised boats for the Indian Army, plans to deliver the first boat by early July, with three of the boats in advanced build stages. The Army's engineer in chief Lt Gen Harpal Singh arrived at Vasco to oversee the initial trials and to inspect the pace of construction.

"Lt Gen Harpal Singh visited Goa Shipyard to review progress of fast patrol boats being made for the Indian Army. He also discussed future requirements of hovercrafts and interceptor boats," said chairman and managing director of GSL B B Nagpal.

The Indian Army has ordered 12 specialised, high altitude patrol boats to match China's heavier type-928B patrol boats and 17 flat bottomed boats to counter incursions by China along the Line of Actual Control (LAC). The 12 boats being built by GSL will be fitted with machine-guns and surveillance gear including optical sensors.

Around six to seven years ago, the rmy acquired 17 QRT (quick-reaction) boats for patrolling the Pangong Tso.

https://timesofindia.indiatimes.com/city/goa/army-reviews-work-on-patrol-vessels/articleshow/83822690.cms

FINANCIAL EXPRESS
Read to Lead

Fri, 25 June 2021

New RFI issued for the long delayed FICV for the Indian Army

Within two years after the contract has been inked, the Indian vendors can collaborate with Foreign OEMS to deliver 75-100 vehicles per year. There will be a three stage induction model, as proposed by the Indian Army

By Huma Siddiqui

For the third time the Indian Army has issued a fresh Request for Information (RFI) for Future Infantry Combat Vehicle (FICV). These vehicles are going to be the mainstay of the mechanized forces for a long time. The Indian Army is keen to get 1750 FICV, a project which is expected to cost around Rs 60,000 crore.

To be equipped with a 30mm main gun and anti-tank missiles besides other firepower and a capacity to carry three or more crew and soldiers.

According to the RFI that has been issued today, out of the total quantities, around 55 percent is going to be the Gun Version and balance would be Specialist Vehicles.

Within two years after the contract has been inked, the Indian vendors can collaborate with Foreign OEMS to deliver 75-100 vehicles per year. There will be a three stage induction model, as proposed by the Indian Army.

What is the Three Stage Induction Model proposed by the Army?

The Stage-I is for Limited Series Production (LSP). In this around 10 per cent of the total number of vehicles will be delivered over a period of two years. This means 75-100 per year.

The Stage-II is going to be Product Improvement. And around 40 per cent of the total number of vehicles are expected to be delivered spread over a period of six to seven years.

And in the final Stage-III, with technical upgrades and product improvement the balance number of vehicles will be delivered.

The response to the RFI issued today is expected in a couple of months' time and once that comes then only the Ministry of Defence will grant Acceptance of Necessity, before the Request for Proposal is issued (RfP).

The Prolonged Saga of FICV

It all started in the late 2000s, when the Mechanised Infantry Directorate had initiated the formal process and the expected cost for replacing the old BMPs was around Rs 26,000 crore. And the plan was to have these vehicles by 2022.

The journey since then has been rough. In 2012, the proposal was withdrawn because the plan was to upgrade the existing vehicles.

And, in 2014, a new plan was rolled out by the government under which the Ordnance Factory Board and two private companies were to develop prototypes of the FICV.

In 2018 FICV project was shifted to Make II project to involve the private sector companies in this project under the Make in India initiative.

As reported by Financial Express Online, in 2019 Indian companies including the L&T, Mahindra and Mahindra, and others sent in their proposals to the Ministry of Defence (MoD).

Also Read: Why Indian Army's $8 bn Future Infantry Combat Vehicle (FICV) project continues to be stuck in uncertainties

Even after putting it under the Make II, no decision could be taken and the file was sent back to the Indian Army Headquarters to understand from the end user how they wanted the project to move forward.

The decision to move it under Make II was taken in 2018, to help in expediting the process as well as promoting the Make in India initiative in the defence sector.

Why did this happen?

It happened due to the difference of opinion between the end user the Army and the MoD which wanted the Army to pay for the project. This led to putting the FICV on the back burner.

As reported earlier this project was initially approved under the Strategic Partnership (SP) model for the armoured vehicle segment. It was under the `Make' category of DPP-2008, before it moved to the Make II of DPP-2016.

In 2018, the then defence secretary at the annual press conference confirmed that the FICV project has been shifted to the `Make II' category. Responding to media queries, he had said that a shift to the `Make II' has been made to fast track the project."

Difference between Make & Make II

According to the DPP-2008, in Make II no funds are required from the ministry, whereas under Make category 90 per cent of the funds up to the prototype stage has to come from the ministry.

Indian Army actually needs a hi-tech complex FICV, which is expected to have a life span of more than three decades. These are needed to replace the current BMP-2 Russian origin infantry combat vehicles by 2025. However, the formal induction of these vehicles may not be before much later in this decade.

Which OEMS are interested in the project?

Original Equipment Manufacturers (OEM) like the Russian companies under the umbrella of Rosoboronexport, and German Rheinmetall, and South Korean Company Hanwha, and Leonardo of Italy.

Which are the Indian companies?

The Ordnance Factory Board (OFB), BEML, Mahindra Group, Ashok Leyland, Larsen and Toubro, Reliance, Bharat Forge and others.

What was required under the `Make' category?

In 2016, under the `Make' category, three development agencies (DAs) were planned which included two from the private sector and one from the Ordnance Factory Board (OFB). And the MoD was supposed to as per the procedure give a minimum Rs 500 crore each to the three DAs.

The Indian Army was asked by the MoD to seek a detailed project report (DPR) from all the contenders who had received the expression of interest (EoI) in 2016. By then the project which was already delayed by a decade got stuck further. The Integrated Project Management Team (IPMT)' which was to seek reports from all the companies which had responded to the revised EoI took more than a year.

What is the Army looking for in the fresh round?

It should have the capability to carry loitering munitions, mini drones which can be used along the eastern, central and northern borders. To be equipped with a 30mm main gun and anti-tank missiles besides other firepower and a capacity to carry three or more crew and soldiers.

https://www.financialexpress.com/defence/new-rfi-issued-for-the-long-delayed-ficv-for-the-indian-army/2277914/

Hindustan Times

Fri, 25 June 2021

Leadership, asset split key concerns for air force on theaterisation move

IAF has been arguing in favour of having only one single theatre as its assets are inadequate for more than one

By Rahul Singh

New Delhi: The setting up of a high-powered government committee to iron out details of the theaterisation plan has turned the spotlight on the Indian Air Force's (IAF) traditional resistance to the setting up of integrated theatre commands, and the need to bring IAF fully on board for speedy roll-out of new joint structures, people familiar with the developments said on Thursday.

The panel was set up last week after a lack of consensus on the theaterisation model emerged earlier this month during a key meeting of top government officials who reviewed a draft Cabinet note on the new joint structures.

Theaterisation has the full backing of the government, and it expects chief of defence staff (CDS) General Bipin Rawat to bring about jointness among the three services by January 2023.

Theaterisation has the full backing of the government, and it expects chief of defence staff (CDS) General Bipin Rawat to bring about jointness among the three services by January 2023. (PTI

IAF has been arguing in favour of having only one single theatre as its assets are inadequate for more than one such construct, said one of the persons cited above, on condition of anonymity. Several top IAF officers and former chiefs have backed the one-theatre argument.

Terming a theatre as land-centric or martime-centric essentially "treats airpower as an adjunct rather than a joint partner in war-fighting," he said.

But some experts point out that the three services cannot work in silos any longer, and air defence is integral to fighting future wars in an era of standalone aerial weapons such as armed UAVs, rockets, missiles, and swarm drones.

The air force also has reservations about the division of its air assets, nomenclature of commands, leadership of theatre commands and dilution of powers of chiefs, as reported by HT on June 21. Put simply, it fears key commands will be led by army generals.

"Deliberations are on to remove differences and build consensus. Theaterisation will be carried out within the prescribed timeline," a top official said.

IAF's opposition to theaterisation also stems from its belief that it has the speed, reach and potential to project military power across geographies without being confined to theatres.

"The operational tempo of the army and navy is relatively slow as compared to the reach and speed of the IAF which is many times faster. Fighter planes can be quickly deployed and redeployed for missions anywhere," said the first person.

A former IAF chief publicly flagged concerns over theaterisation three years ago. In April 2018, then IAF chief Air Chief Marshal BS Dhanoa disapproved of the concept of theatre commands, arguing it would require the creation of more assets. "Compartmentalising will require more assets. We believe in one country, one theatre," Dhanoa said. The IAF currently has 30 combat squadrons with 16-18 fighters each, compared to a sanctioned strength of 44.

While IAF's resistance to the concept of theaterisation was well known, an explicit acknowledgment of that opposition by a serving chief was then seen as rare. In December 2018,

then navy chief Admiral Sunil Lanba, who was also the chairman of the chiefs of staff committee (COSC) at that time, acknowledged that the IAF was opposed to the creation of theatre commands.

A senior IAF official, who did not want to be named, said the air force can operate from anywhere and carry out any mission assigned to it demonstrated three years ago during Exercise Gaganshakti-2018 that saw the IAF move its assets from the western to the eastern front in less than 48 hours.

"Fighter planes can take off from a base in south India, hit targets in the Bay of Bengal and land in the east. Division of assets under the current theaterisation model will rob the IAF of its flexibility," the official said.

IAF is down to barely 30 squadrons and it's not a good time to split its assets, said Air Marshal Anil Chopra (retd), director general, Centre for Air Power Studies. "India should have a single military theatre considering the threat it faces from the Western Theatre Command of China that covers a geographical area larger than the size of India. More deliberations are required between the services for creating a robust system," Chopra said.

But theaterisation is also how the forces of most countries, including the US and China are organised. It has obvious advantages: better command and control, faster decision making and superior cross-service synergy, and India is very keen on it.

No service should feel that they will have an upper hand or become subordinate to another service, said Lieutenant General DB Shekatkar (retd), who headed a top committee that recommended the appointment of CDS and creation of theatre commands in a comprehensive report on military reforms submitted in December 2016.

"Such thinking does not reflect sound national strategic thinking. We should all be mature enough to take India's long-term interests into account," he said.

Rawat on Tuesday said new reforms do face hurdles, but the three services were in agreement on taking theaterisation forward. He said hurdles were necessary as they underscored the need for holding more discussions to fine-tune plans.

In March, Rawat said India's military leadership will have to "more than match the political vision" that has mandated the creation of theatre commands to address future security threats. He said "service parochialism" will have to make way for "a combined services outlook" to take theaterisation forward, calling for the military's transformation to "outthink and outfight" India's adversaries.

https://www.hindustantimes.com/india-news/leadership-asset-split-key-concerns-for-air-force-on-theaterisation-move-101624559270502.html

Business Standard

Fri, 25 June 2021

India, US join to conduct integrated maritime engagements in Indian Ocean

The United States Navy and Indian armed forces again joined together to conduct integrated sea and air engagements off the coast of India on June 23 and 24

The United States Navy and Indian armed forces again joined together to conduct integrated sea and air engagements off the coast of India on June 23 and 24.

According to a press release, the Ronald Reagan Carrier Strike Group (CSG 5) participated in joint multi-domain engagements with the Indian Navy and Air Force. These engagements are designed to build on the high-calibre integration achieved during the Theodore Roosevelt Strike Group engagement in March 2021.

"Our nations share a common interest in a secure Indo-Pacific," said Rear Admiral Will Pennington, commander, Carrier Strike Group 5/Task Force 70. "Working collectively with like-minded nations to provide full-spectrum awareness and defense of the vast Indian Ocean expanse ensures stability in the region."

According to the release, the integration of Indian forces sharpens the regional maritime security construct to uphold a rules-based maritime order in the Indian Ocean Region.

Indian participating forces include a Kolkata-class guided-missile destroyer INS Kochi (D 64), a Talwar-class frigate INS Teg (F 45), a P-8I maritime patrol and reconnaissance aircraft, MiG-29K fighters from the Indian Navy Air Squadron 303, and Su-30 fighter aircrafts from the Indian Air Force 222 Squadron.

"Flying with our counterparts from the Indian Navy and Air Force has been a great opportunity for the aircrew assigned to CTF 70, providing challenging airborne scenarios necessary for building the confidence to operate effectively together within the Indo-Pacific region," said Commander Daniel O'Hara, commanding officer, Strike Fighter Squadron (VFA) 102.

"We developed critical relationships that we hope to renew in the near future with a shared and continued focus on multi-national interoperability and the highest levels of professional airmanship," added O'Hara. The events included an anti-submarine exercise, aerial exercises like dissimilar aircraft combat training (DACT), detect-to-engage sequence, helicopter cross-decking, and formation maneuvering.

The series of at-sea exercises reinforced the converging maritime interests of the United States and India, coming on the heels of US Secretary of Defense Lloyd Austin and Indian Minister of External Affairs Dr S Jaishankar's meeting at the Pentagon in May as part of India's first cabinet-level visit to Washington, DC during the Biden-Harris administration, as per the release.

Austin visited India during his first international trip in March, highlighting the importance that the Department of Defense places on this strategic partnership.

The strike group is committed to upholding US security agreements with regional allies and partners, demonstrating the capability of forward-deployed naval forces to quickly respond across the region.

CSG 5 includes the Navy's only forward-deployed aircraft carrier USS Ronald Reagan (CVN 76), the embarked staffs of Task Force 70 and Destroyer Squadron (DESRON) 15, Ticonderoga-class guided-missile cruiser USS Shiloh (CG 67), and Arleigh Burke-class guided-missile destroyer USS Halsey (DDG 97), as well as aircraft from Carrier Air Wing (CVW) 5.

https://www.business-standard.com/article/current-affairs/india-us-join-to-conduct-integrated-maritime-engagements-in-indian-ocean-121062500072_1.html

Press Information Bureau
Government of India

Ministry of Science & Technology

Thu, 24 June 2021 4:15PM

ARCI develops cost-effective catalysts for metal-air battery

A new non-precious metal-based bi-functional electrocatalyst (capable of catalyzing two different types of reactions) can decrease cost and increase the efficiency of metal air batteries.

With the rise in demand for different energy sources, worldwide efforts are being made to develop different kinds of energy devices, such as lithium-ion batteries, lead-acid batteries, redox flow batteries, lithium-air batteries, zinc-air batteries, etc. sodium-ion batteries, fuel cells, and super capacitors.

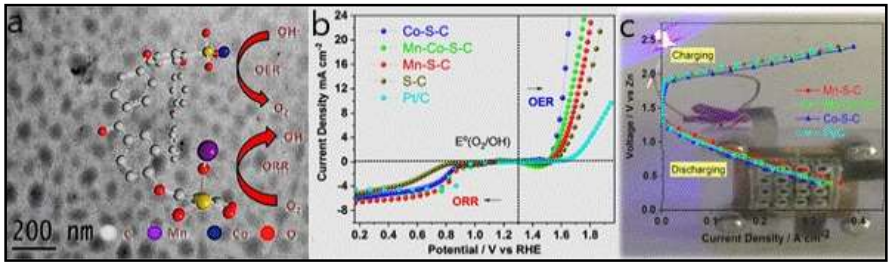


Fig. a) TEM image of Mn-S-C catalyst b) electrochemical property and c) charge-discharge characteristics of the developed catalysts.

Among them, Zn-air batteries have drawn significant attention due to their low cost and high energy density. They are compact power sources for portable electronics and electric vehicles and energy storage devices to manage energy flow among renewable energy generators, such as wind turbines, photovoltaic panels, electric grids, and end-users. However, a major challenge for such batteries is catalyst development. A bi-functional catalyst works for oxygen reduction while discharging the battery and the same catalyst helps in oxygen evolution reaction during the charging cycle. Most of the conventional catalysts available consist of noble metals in their composition, making the batteries costly.

International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), an autonomous R&D Centre of Department of Science and Technology (DST), Govt. of India, has developed the cost-effective electrocatalyst by anchoring transition metal ions into the sulfur-doped carbon framework via carbonization of a polymer called sPEEK (sulphonated polyether ether ketone). This catalyst synthesis method can also be used to recycle used ionomers (polymer composed of both neutral repeating units and ionized units).

The scientists have used an ion-exchange strategy that positions the metal ions in the carbon framework homogeneously, limits the particle size and offers control on composition and size at a very low loading of transition metal. Cost-effectiveness is thus achieved by low loading of transition metal, high activity, and high cycling stability compared to many of the catalysts earlier reported in the literature.

The catalyst also leads to reduced voltage polarization, enabling higher energy efficiency and a stable charge-discharge characteristic. The results obtained were comparable to that of conventionally used noble metal-based catalysts with metal loading of 20% or higher. The research has been published in ACS Applied Energy Materials.

https://pib.gov.in/PressReleasePage.aspx?PRID=1730034

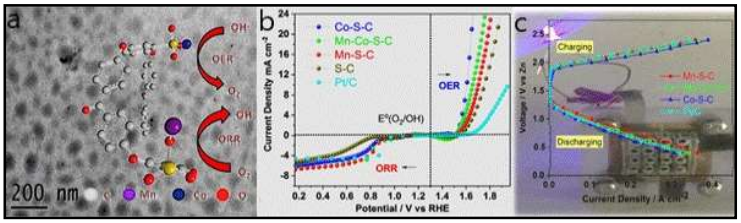
पत्र सूचना कार्यालय
भारत सरकार

विज्ञान एवं प्रौद्योगिकी मंत्रालय

Thu, 24 June 2021 4:15PM

एआरसीआई ने मेटल-एयर बैटरी के लिए सस्ते उत्प्रेरक विकसित किए

एक नया गैर-कीमती धातु-आधारित द्वि-कार्यात्मक इलेक्ट्रोकैटलिस्ट (दो अलग-अलग प्रकार की प्रतिक्रियाओं को उत्प्रेरित करने में सक्षम) मेटल - एयर बैटरियों की लागत को कम कर सकता है और उनकी दक्षता में वृद्धि कर सकता है।



चित्र अ) एमएन-एससी उत्प्रेरक की टीईएम इमेज ब) विद्युत रासायनिक गुण और स) विकसित उत्प्रेरक की चार्ज-डिस्चार्ज संबंधी विशेषताएं।

ऊर्जा के विभिन्न स्रोतों की मांग में वृद्धि के साथ, दुनिया भर में विभिन्न प्रकार के ऊर्जा उपकरणों जैसे कि लिथियम-आयन बैटरी, लेड-एसिड बैटरी, रेडॉक्स फ्लो बैटरी, लिथियम-एयर बैटरी, जिंक-एयर बैटरी, सोडियम-आयन बैटरी, ईंधन सेल और सुपर कैपेसिटर आदि को विकसित करने के प्रयास किए जा रहे हैं।

उनमें से, जिंक-एयर बैटरियों ने अपनी कम लागत और उच्च ऊर्जा घनत्व के कारण उल्लेखनीय रूप से ध्यान आकर्षित किया है। वे पोर्टेबल इलेक्ट्रॉनिक्स एवं इलेक्ट्रिक वाहनों और ऊर्जा भंडारण उपकरणों के लिए पवन टरबाइन, फोटोवोल्टिक पैनल, इलेक्ट्रिक ग्रिड जैसे अक्षय ऊर्जा जनरेटरों और अंतिम-उपयोगकर्ताओं के बीच ऊर्जा प्रवाह का प्रबंधन करने के लिए कॉम्पैक्ट पावर स्रोत हैं। हालांकि, ऐसी बैटरियों के लिए एक बड़ी चुनौती उत्प्रेरक का विकास है। एक द्वि-कार्यात्मक उत्प्रेरक बैटरी को डिस्चार्ज करते समय ऑक्सीजन कम करने के लिए काम करता है और वही उत्प्रेरक चार्जिंग चक्र के दौरान ऑक्सीजन के विकास की प्रतिक्रिया में मदद करता है। अधिकांश पारंपरिक उत्प्रेरकों की संरचना में उत्कृष्ट धातुएं शामिल होती हैं, जिससे बैटरी महंगी हो जाती है।

इंटरनेशनल एडवांस्ड रिसर्च सेंटर फॉर पाउडर मेटलर्जी एंड न्यू मैटेरियल्स (एआरसीआई), जोकि भारत सरकार के विज्ञान एवं प्रौद्योगिकी विभाग (डीएसटी) का एक स्वायत्त अनुसंधान एवं विकास केन्द्र है, ने स्पीक (सल्फोनेटेड पॉलीईथर ईथर कीटोन) नामक बहुलक के कार्बनीकरण के माध्यम से सल्फर-डॉप्ड कार्बन ढांचे में संक्रमण धातु आयनों की एंकरिंग करके सस्ता इलेक्ट्रोकैटलिस्ट विकसित किया है। इस उत्प्रेरक संश्लेषण विधि का उपयोग इस्तेमाल किए जा चुके आयनकों (आयनोमर्स) (तटस्थ दोहराई जाने वाली इकाइयों और आयनित इकाइयों दोनों से बने बहुलक) का पुनर्चक्रण करने के लिए भी किया जा सकता है।

वैज्ञानिकों ने एक आयन-विनिमय रणनीति का उपयोग किया है जो कार्बन ढांचे में धातु आयनों को समांगी रूप में रखता है, कण के आकार को सीमित करता है और संक्रमण धातु की बहुत कम लोडिंग पर संरचना और आकार पर नियंत्रण प्रदान करता है। इस प्रकार दस्तावेजों में पहले से बताए गए कई उत्प्रेरकों की तुलना में इसकी कम लागत संक्रमण धातु की कम लोडिंग, उच्च गतिविधि और उच्च चक्रण स्थिरता द्वारा प्राप्त की जाती है।

यह उत्प्रेरक उच्च ऊर्जा दक्षता और स्थिर चार्ज-डिस्चार्ज की विशेषता में सक्षम बनाते हुए कम वोल्टेज ध्रुवीकरण भी सुनिश्चित करता है। प्राप्त परिणाम 20 प्रतिशत या उससे अधिक की धातु लोडिंग के साथ

पारंपरिक रूप से उपयोग किए जाने वाले उत्कृष्ट धातु-आधारित उत्प्रेरक के साथ तुलना के योग्य थे। यह शोध एसीएस एप्लाइड एनर्जी मैटेरियल्स में प्रकाशित किया गया है।

https://pib.gov.in/PressReleasePage.aspx?PRID=1730173

Fri, 25 June 2021

A simple method to enhance responsivity of terahertz radiation detectors

Scientists of Tomsk Polytechnic University jointly with colleagues from Spanish universities have offered a simple method how to enhance the responsivity of terahertz radiation detectors by 3.5 times using a small Teflon cube. The 1 mm cube must be put on the surface of the detector without changing the inner design of the detector.

Credit: CC0 Public Domain

Such detectors are applied in full-body scanners, spectrometers, and medical devices for diagnosing skin cancer, burn injuries and pathological changes in the blood. The research findings were published in the *Optics Letters*.

The terahertz range lies between the microwave and infrared ranges in the electromagnetic spectrum. Waves shorter than 1 mm propagate in the terahertz range. They are able to percolate various materials while not leading to atomic ionization of matter, unlike X-rays.

"Terahertz radiation detectors are, as a rule, rather compact devices. Nowadays, researchers from different countries are interested in the enhancement of their responsivity and other parameters. The higher responsivity, the weaker signals can be received and more precise measurements can be carried out. Most researchers are trying to solve this problem by changing the design of the detector and the materials it is made from. It is complicated and often very expensive. Meanwhile, our solution is plain to see," says Oleg Minin, Professor of the Division for Electronic Engineering of the TPU School of Non-Destructive Testing.

In their experiments, the scientists used a microparticle in the form of the Teflon cube, an available dielectric material through which electromagnetic waves of the terahertz range are capable of percolating. The cube was put on the surface of the detector.

"There is a responsive site inside of the detector. The site can be made from various materials but its typical scale is always less than the wavelength. It is the area responsible for trapping electromagnetic waves and transferring them. Due to the form and material, our cube possesses a capability to focalize radiation well, falling on the responsive site of the detector, in the scale limited to or smaller than a diffraction-limited system. The experiments conducted jointly with the Spanish colleagues proved it: the particle focalized the radiation and the emitted radiation fell into the responsive area," Oleg Minin explains.

According to the scientists, the developed method of detector responsivity enhancement without changing its design is applicable to almost any detector.

During the experiments, the scientists fixed responsivity enhancement by 11 decibels, which is 3.5 times higher than the standard parameters of the detector.

More information: Igor Vladilenovich Minin et al, Responsivity enhancement of a strained silicon field-effect transistor detector at 03 THz using the terajet effect, *Optics Letters* (2021). DOI: 10.1364/OL.431175

https://phys.org/news/2021-06-simple-method-responsivity-terahertz-detectors.html

PHYS.ORG

Fri, 25 June 2021

Researchers resolve magnetic structures of different topological semimetals

By Zhang Nannan

Topological semimetals are one of the major discoveries in condensed-matter physics in recent years. The magnetic Weyl semimetal, in which the Weyl nodes can be generated and modulated by magnetization, provides an ideal platform for the investigation of the magnetic field-tunable link between Weyl physics and magnetism. But due to the lack of appropriate or high quality specimens, most of the theoretically expected magnetic topological semimetals have not been experimentally confirmed. Therefore, exploration of new magnetic topological semimetals is of great importance.

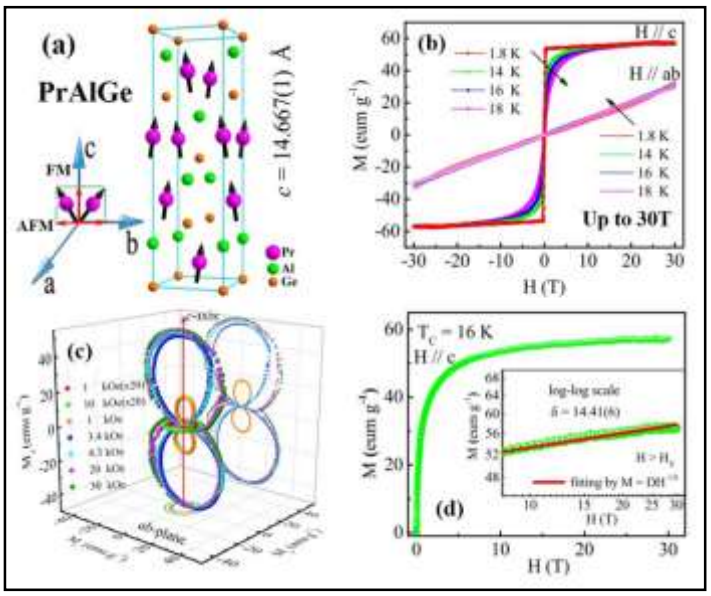


Figure 1. (a) Crystal and magnetic structures of PrAlGe; (b) M(H) curves up to high magnetic field of 30T; (c) angular-dependent magnetization; (d) critical isothermal analysis under high magnetic field. Credit: ZHANG Lei

Recently, researchers from the High Magnetic Field Laboratory of the Hefei Institutes of Physical Science (HFIPS), in collaboration with researchers from Huazhong University of Science and Technology and Anhui University, resolved magnetic structures of different topological semimetals with the help of Resistive Magnet of China's Steady High Magnetic Field Facility (SHMFF) of HFIPS.

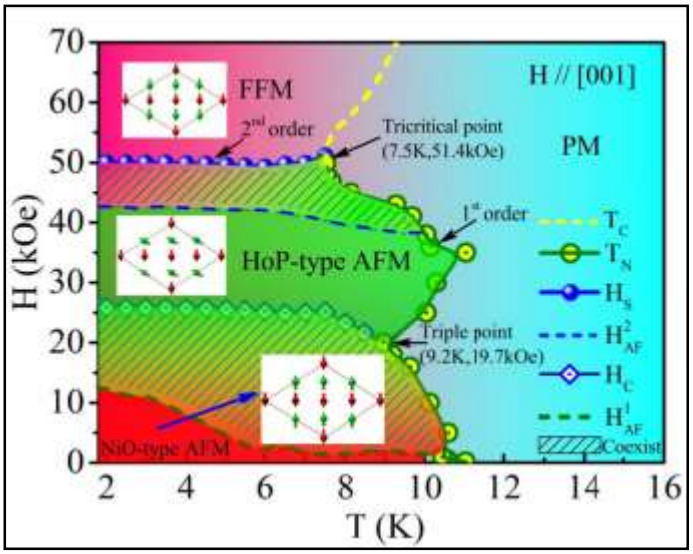


Figure 2. H-T phase diagram for DySb. Credit: ZHANG Lei

The team performed an investigation on high-quality single crystals of PrAlGe and DySb. For PrAlGe, the intrinsic ferromagnetic ordering acts as a Zeeman coupling to split the spin-up and spin-down bands, but the whole band structure is still kept. The study of magnetism suggested that the magnetic interaction in PrAlGe is of a 2D Ising type, revealing a uniaxial magnetic interaction along the c axis. However, the ordering moments are tilted from the c axis, which causes antiferromagnetism in the ab plane.

As for DySb, a field-induced tricritical phenomenon is revealed. Based on the magnetization analysis, a detailed H-T phase diagram around the phase transition is constructed when the magnetic field is applied along [001] direction.

This phase diagram is indicative of delicate competition and balance between multiple magnetic interactions in these systems and lays a solid foundation for future research in topological transition and criticality.

More information: Wei Liu et al, Field-induced tricritical phenomenon and multiple phases in DySb, *Physical Review B* (2020). DOI: 10.1103/PhysRevB.102.174417

Wei Liu et al, Critical behavior of the magnetic Weyl semimetal PrAlGe, *Physical Review B* (2021). DOI: 10.1103/PhysRevB.103.214401

Journal information: *Physical Review B*

https://phys.org/news/2021-06-magnetic-topological-semimetals.html

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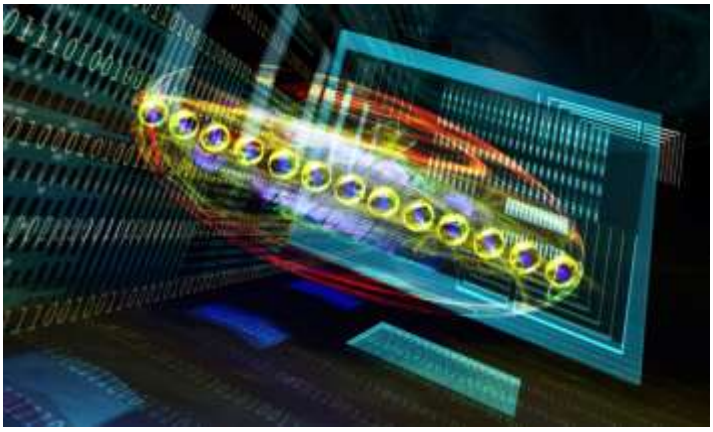
Quantum simulation: Measurement of entanglement made easier

University of Innsbruck researchers have developed a method to make previously hardly accessible properties in quantum systems measurable. The new method for determining the quantum state in quantum simulators reduces the number of necessary measurements and makes work with quantum simulators much more efficient.



The new method reconstructs the quantum state of the quantum simulator on a classical computer from a few measurements. It also lets the user compare the quantum state stored on a classical computer with the state in the laboratory. Credit: IQOQI Innsbruck/Harald Ritsch

In a few years, a new generation of quantum simulators could provide insights that would not be possible using simulations on conventional supercomputers. Quantum simulators are capable of processing a great amount of information since they quantum mechanically superimpose an enormously large number of bit states. For this reason, however, it also proves difficult to read this information out of the quantum simulator. In order to be able to reconstruct the quantum state, a very large number of individual measurements are necessary. The method used to read out the quantum state of a quantum simulator is called quantum state tomography.

"Each measurement provides a 'cross-sectional image' of the quantum state. You then put these cross-sectional images together to form the complete quantum state," explains theoretical physicist Christian Kokail from Peter Zoller's team at the Institute of Quantum Optics and Quantum Information at the Austrian Academy of Sciences and the Department of Experimental Physics at the University of Innsbruck. The number of measurements needed in the lab increases very rapidly with the size of the system. "The number of measurements grows exponentially with the number of qubits," the physicist says. The Innsbruck researchers have now succeeded in developing a much more efficient method for quantum simulators.

Efficient method that delivers new insights

Insights from quantum field theory allow quantum state tomography to be much more efficient, i.e., to be performed with significantly fewer measurements. "The fascinating thing is that it was not at all clear from the outset that the predictions from quantum field theory could be applied to our quantum simulation experiments," says theoretical physicist Rick van Bijnen. "Studying older scientific papers from this field happened to lead us down this track." Quantum field theory provides the basic framework of the quantum state in the quantum simulator. Only a few measurements are then needed to fit the details into this basic framework.

Based on this, the Innsbruck researchers have developed a measurement protocol by which tomography of the quantum state becomes possible with a drastically reduced number of measurements. At the same time, the new method allows new insights into the structure of the quantum state to be obtained. The physicists tested the new method with experimental data from an ion trap quantum simulator of the Innsbruck research group led by Rainer Blatt and Christian Roos. "In the process, we were now able to measure properties of the quantum state that were previously not observable in this quality," Kokail recounts.

Verification of the result

A verification protocol developed by the group together with Andreas Elben and Benoit Vermersch two years ago can be used to check whether the structure of the quantum state actually matches the expectations from quantum field theory. "We can use further random measurements to check whether the basic framework for tomography that we developed based on the theory actually fits or is completely wrong," explains Christian Kokail.

The protocol raises a red flag if the framework does not fit. Of course, this would also be an interesting finding for the physicists, because it would possibly provide clues for the not yet fully understood relationship with quantum field theory. At the moment, the physicists around Peter Zoller are developing quantum protocols in which the basic framework of the quantum state is not stored on a classical computer, but is realized directly on the quantum simulator.

The study is published in *Nature Physics*.

More information: Entanglement Hamiltonian tomography in quantum simulation, *Nature Physics* (2021). DOI: 10.1038/s41567-021-01260-w , www.nature.com/articles/s41567-021-01260-w

Journal information: *Nature Physics*

https://phys.org/news/2021-06-quantum-simulation-entanglement-easier.html

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Novel method to accurately, quickly detect COVID-19 from phone swabs

- ***The researchers from University College London (UCL) in the UK analysed swabs from mobile screens rather than directly from people using the method known as Phone Screen Testing (PoST)***

London: Researchers have developed a non-invasive and low-cost method that can accurately and rapidly detect COVID-19 using samples taken from the screens of smartphones.

The researchers from University College London (UCL) in the UK analysed swabs from mobile screens rather than directly from people using the method known as Phone Screen Testing (PoST).

They found that people who tested positive by the regular nasal swabbing PCR test were also positive when samples were taken from smartphone screens.

The new method, described in the journal eLife on Tuesday, detected the COVID-19 virus on the phones of 81 to 100 per cent of contagious people with a high viral load, suggesting it is as accurate as antigen tests.

The researchers noted that globally active screening for COVID-19 is still a priority as new variants keep emerging and the vaccination rollout is not guaranteed in many countries.

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However, testing is expensive and can be physically unpleasant, both of which are significant hurdles on the road to an effective test and trace system, they said.

As PoST is an environmental test, rather than a clinical test, it is both non-invasive and less expensive than a traditional nasal swabbing PCR, according to the researchers.

This means not only is it suitable for rollout in lower-income countries, but it also removes the discomfort of current COVID-19 testing options, potentially increasing take-up of regular testing among the general population, they explained.

The team noted that PoST sampling takes less than a minute and does not require medical personnel, which eases mass adoption in big facilities and large-scale applications.

"Like many, I was very worried about the economic and social impact that the pandemic would leave behind, particularly in lower-income countries," said Rodrigo Young from UCL Institute of Ophthalmology.

"PoST is a method that would not only make COVID-19 mass testing much easier but could also be used to contain outbreaks of new naturally occurring and man-made viruses, to avoid future pandemics," Young said.

A machine is currently under development by Diagnosis Biotech, a Chilean startup founded by Young, which will build on this research, safely taking a phone for PoST sampling and deliver the results directly via SMS to minimise contact.

https://www.livemint.com/science/health/novel-method-to-accurately-quickly-detect-covid-19-from-phone-swabs-11624531014641.html