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Business Standard

Tue, 08 June 2021

Export, border infrastructure among key defence reforms in 2020

Atmanirbhar Bharat, Covid fight also on Rajnath's list of 20 key upgrades

By Ajai Shukla

New Delhi: Defence Minister Rajnath Singh on Monday released a list of 20 reforms undertaken by the Ministry of Defence (MoD) in 2020.

Defence Minister Rajnath Singh releases an e-booklet titled '20 Reforms in 2020', in New Delhi on Monday Photo: PTI

"The booklet is a reflection of the resolve of the government, under the able leadership of Prime Minister Narendra Modi, to make the defence sector stronger and more efficient," he said.

The reforms focused on the PM's "Atmanirbhar Bharat" (self-reliant India) initiative, on boosting defence exports, accelerating procurement, strengthening border infrastructure, participation of women in the military, transforming research and development (R&D) to boost innovation, and assisting in the fight against Covid-19.

Chief of Defence Staff & Department of Military Affairs

Former Army chief, General Bipin Rawat, was appointed India's first Chief of Defence Staff (CDS) and head of the newly created Department of Military Affairs (DMA). The CDS was created to increase coordination between the three services. The DMA was established to improve civil-military integration.

Aatmanirbharta in defence

To promote "Make in India" in defence, a list of 101 defence items was notified in August 2020, which would be embargoed for import on laid down dates. A second list of 108 items was announced last week.

In addition, the new Defence Acquisition Procedure of 2020 (DAP 2020) was promulgated. Of the capital budget for 2020-21, Rs 52,000 crore was earmarked for indigenous defence equipment. In May 2020, the Ordnance Factory Board (OFB) was corporatized for greater productivity.

Indigenous weaponry nearing completion included a Quick Reaction Surface to Air Missile and Pinaka rocket launcher, both developed by the Defence R&D Organisation (DRDO).

Increased defence exports

Defence exports rose from Rs 1,941 crore in 2014-15 to Rs 9,116 crore in 2019-20. With exports to more than 84 countries, India now finds mention in the lists of defence equipment exporting nations.

Modernisation and defence acquisitions

Rajnath claimed the "highest-ever thrust towards modernisation in last 10 years," with the capex budget increasing by 10 per cent in 2020-21 over the previous year. In fact, the defence allocation for 2020-21 fell short by 25 per cent (Rs 1.02 trillion) compared to the military's financial projections.

The arrival in India of the first five Rafale fighters in July 2020 and several more since then, added firepower to the Indian Air Force.

Reforming Defence R&D

To promote innovation by young minds, five DRDO "Young Scientists Laboratories" were launched in 2020 in Bengaluru, Mumbai, Chennai, Kolkata and Hyderabad," said the MoD.

Digital transformation

Several MoD organisations went digital, with the Directorate General Quality Assurance (DGQA) starting online pre-delivery inspection in May 2020. Armed Forces Tribunals began digital hearing of cases in August 2020. Meanwhile, Defence Estates, Canteen Stores Department, Cantonment services, MoD pension and National Cadet Corps (NCC) also went online, providing faster and transparent services.

Strengthening border infrastructure

Reforms within the Border Roads Organisation (BRO) enabled it to achieve targets ahead of schedule. The Atal tunnel at Rohtang, on the Leh-Manali Highway, was inaugurated by the PM in October 2020. The tunnel provides all-weather connectivity to Ladakh.

Stree Shakti in the military

In 2020, the MoD says "historic decisions" were taken to increase women's participation in the military. Ten branches of the Army were opened to women officers for Permanent Commission. The navy operationalised women pilots for the first time. Sainik Schools were thrown open for girl students from the 2020-21 academic session.

Reforms in NCC

On Independence Day last August, the PM announced expansion of the NCC to remote locations. More than 1,075 schools and colleges in border and coastal areas were identified and the enrolment began in November 2020. It was also decided to give preference to NCC cadets for enrolment in the Central Armed Police Forces from May 2020.

Aid to combat Covid-19

The three services mobilised maximum resources to aid the government in fighting the pandemic. Armed Forces Medical Services (AFMS) provided emergency support, mobilised healthcare professionals and established quarantine facilities across the country. The DRDO set up hospitals to treat Covid patients, passed on technology expertise to the private sector for manufacturing ventilators, oxygen plants, medicines, test kits and PPE kits.

Help beyond boundaries

To help neighbouring countries, the Navy mounted eight relief missions during 2020-21, providing Covid-19 medicines and doctors to five countries. Meanwhile, the IAF executed 800 relief missions. Indians stranded in Iran, Sri Lanka and Maldives were evacuated under the Vande Bharat Mission.

https://www.business-standard.com/article/economy-policy/export-border-infrastructure-among-key-defence-reforms-in-2020-121060701476_1.html

THE ECONOMIC TIMES

Tue, 08 June 2021

India's defence exports since 2014-15 estimated at Rs 35,777 crore

Synopsis

"The booklet is a reflection of the resolve of the government, under the able leadership of Prime Minister Narendra Modi, to make the defence sector stronger and more efficient," Singh said.

India exported military hardware and systems worth Rs 35,777 crore in the last seven years, according to a document released by Defence Minister Rajnath Singh on Monday. The E-booklet, highlighting the major reforms undertaken by the Ministry of Defence (MoD) in 2020, also mentioned that the defence exports expanded to more than 84 countries.

"The booklet is a reflection of the resolve of the government, under the able leadership of Prime Minister Narendra Modi, to make the defence sector stronger and more efficient," Singh said.

He exuded confidence that the reforms undertaken by the MoD will make India a global powerhouse in the defence sector in the times to come.

According to the document, the value of India's exports in 2014-15 was Rs 1,941 crore and it increased to Rs 2,059 crore in 2015-16. The value of exports in 2016-17 was recorded at Rs 1,522 crore while it went up to Rs 4,682 crore in 2017-18 and Rs 10,746 crore in 2018-19.

The value of defence exports was Rs 9,116 crore in 2019-20 and Rs 5,711 crore in 2020-21, according to the details mentioned in the document.

The value of defence exports was Rs 9,116 crore in 2019-20 and Rs 5,711 crore in 2020-21, according to the details mentioned in the document.

The compilation provided a brief overview of the defence reforms undertaken in 2020 to bring about greater cohesion and modernisation of the armed forces through policy changes, innovation and digital transformation, the statement said.

"To meet requirements of the changing technology, there is a constant effort to equip our armed forces with the latest weapons to meet challenges emanating from the land, air and sea; and by bringing about jointness and modernisation through reforms," Singh was quoted as saying in the document.

The document listed acquisitions of the Rafale fighter aircraft, the appointment of the country's first Chief of Defence Staff, reforms in defence research and development and increasing defence reforms as some of the key initiatives of the government in the defence sector in 2020.

"Policy reforms for increased transparency included the launch of new Defence Acquisition Procedure in September 2020 and revision of DRDO Procurement Manual in October 2020," the ministry said.

https://economictimes.indiatimes.com/news/defence/indias-defence-exports-since-2014-15-estimated-at-rs-35777-crore/articleshow/83316248.cms

THE TIMES OF INDIA

Tue, 08 June 2021

Debris worry: 50 impact tests at 5km/sec to test Gaganyaan crew module

By Chethan Kumar

Bengaluru: Concerns about protecting payloads against orbital debris and micro-meteoroids is not strange for any space agency, but they get amplified when humans are involved. And, the Indian Space Research Organisation (ISRO) is preparing for the same with the crew module of Gaganyaan which will be carrying astronauts to space.

To test the module's material against what the space agency calls MMOD (Micro-Meteoroid and Orbital Debris), it plans to conduct at least 50 hypervelocity impact tests that evaluate critical components of the crew module against MMOD impact.

ISRO works on improving payloads with Gaganyaan's crew modul. File photo

ISRO's Human Space Flight Centre (HSFC) has signed an MoU with the Defence Research and Development Organisation's (DRDO) Terminal Ballistics Research Laboratory (TBRL), which has the only test facility in India to achieve a velocity of 5,000 meters/second.

Stressing on the importance of tests for the safety of astronauts, Unnikrishnan Nair, director, HSFC, said that the threat of space debris impact due to an exponential increase in MMOD around Earth in the last 60 years of space exploration has grown multifold.

DRDO Facility

"Orbital debris moves at such high velocities that the impact of even a paint flake can cause significant damage to the crew module in the absence of appropriate shielding," Nair said at a video conference.

A two-stage light gas gun facility at TBRL in Chandigarh — the only test facility that can achieve the required velocity — will be utilized to conduct the hypervelocity impact studies. "Some feasibility tests have already been conducted on dummy targets to establish the internal ballistics parameters and high-speed diagnostics to meet the stringent timelines of the human space mission," the DRDO said.

DRDO's coordinator for the Gaganyaan mission, Tapan Khilariwal, confirmed that at least 50 hypervelocity impact tests have been envisaged in the MoU to evaluate critical components of the crew module.

Space Debris

The concerns of an impact are not unfounded as reminded by the recent collision of an ISS (International Space Station) robotic arm with a piece of space debris.

As per a recent dataset made public by the General Catalog of Artificial Space Objects by astronomer Jonathan McDowell, which is considered the most complete catalog of satellites, spacecraft, debris, space organizations, and launches, at least 23,000 of the more than 50,000 space objects' database since 1958 continue to remain in orbit.

And, if plans by various space agencies and private firms are any indication, the increasing number of space missions will only add to this number — more swiftly than ever before in the history of space exploration.

https://timesofindia.indiatimes.com/india/debris-worry-50-impact-tests-at-5km/sec-to-test-gaganyaan-crew-module/articleshow/83310849.cms

COVID 19: DRDO's Contribution

THE TIMES OF INDIA

Tue, 08 June 2021

Govt seeks nod to test 2DG on patients with mild infection

By Ipsita Pati

Gurgaon: The Haryana government plans to test the efficiency of an anti-Covid drug developed by the Defence Research and Development Organisation (DRDO) on patients with mild infection. Experts at PGIMS, Rohtak said they have sent a proposal regarding this trial to the Drugs Controller General of India on Saturday, seeking permission.

DRDO has developed the drug 2-deoxy-D-glucose (2DG) in collaboration with pharmaceutical company Dr Reddy's Laboratories and it has been approved for emergency use. The drug is currently being used as an adjunct therapy in moderate to severe coronavirus patients.

It comes in powder form in a sachet, which is taken orally by dissolving it in water. The drug accumulates in the virus-infected cells and prevents virus growth by stopping its synthesis and energy production.

2DG's selective accumulation in virally infected cells makes this drug unique.

"The plan is to give the drug to mild patients to see how far it prevents virus growth, if they get any relief and how efficient it is for them," said Dr Dhruv Chaudhary, nodal officer for the Covid-19 response in Haryana.

Permission to start the trial will have to come from the Drugs Controller General of India. The trial will also explore how mild patients respond to the drug. "The sample size and timeline will be decided once we get approval," said Dr Chaudhary.

Clinical trial results have shown that 2DG helps in faster recovery of hospitalised patients. According to the efficacy trends, a significantly high proportion of patients treated with the drug improved symptomatically and became free from supplemental oxygen dependence.

This triggered the idea to conduct a test on mild cases with a view to reduce the severity of the infection, officials said.

https://timesofindia.indiatimes.com/city/gurgaon/govt-seeks-nod-to-test-2dg-on-patients-with-mild-infection/articleshow/83325595.cms

Outlook

Tue, 08 June 2021

U''khand: Trial run of oxygen generation plant held at IDPL Rishikesh

Rishikesh: The trial run of an oxygen generation plant was held at the IDPL campus here on Monday, officials said.

Set up by the engineers of the Indian Army"s Golden Key Eagles unit, the plant has the capacity to produce 720 cubic metre of oxygen in 24 hours.

It is part of the state government"s continued efforts to ramp up health infrastructure in view of the second wave of Covid.

Indian Drugs and Pharmaceutical Limited (IDPL) MD Sanjay Kumar said formal production by the plant will begin after the licensing formalities are completed in a couple of days.

According to officials, a 500-bed makeshift hospital was setup by the Defence Research and Development Organisation (DRDO) at the IDPL campus in May amid a surge in new Covid cases in the state.

(Disclaimer: This story has not been edited by Outlook staff and is auto-generated from news agency feeds. Source: PTI)

https://www.outlookindia.com/newsscroll/ukhand-trial-run-of-oxygen-generation-plant-held-at-idpl-rishikesh/2097699

Defence News

Defence Strategic: National/International

Press Information Bureau
Government of India

Ministry of Defence

Mon, 07 June 2021 5:32PM

Vice Admiral Rajesh Pendharkar, AVSM, VSM assumes Charge as Director General Naval Operations

Vice Admiral Rajesh Pendharkar, AVSM, VSM has assumed charge as Director General Naval Operations today, on 07 Jun 21. An alumnus of the National Defense Academy, Khadakwasla, Pune, he was commissioned into the Indian Navy in Jan 1987. He is a graduate of the Defence Services Staff College, Wellington, Naval War College, Karanja, and Naval Command College, Newport, Rhode Island, USA.

The Flag Officer is a specialist in Anti-Submarine Warfare (ASW) and has served on frontline warships of the Navy as ASW Officer and later as the Executive Officer and Principal Warfare Officer of Guided Destroyer INS Mysore

He has commanded the missile corvette INS Kora, the missile frigate INS Shivalik and the aircraft carrier INS Viraat. He has held important staff appointments in IHQ MoD (Navy) in the Directorate of Staff Requirements, Directorate of Personnel, and the Directorate of Net-Centric Operations.

On promotion to the rank of Rear Admiral in Feb 2016, he was appointed as the Assistant Chief of Integrated Defence Staff (Int – A) at HQ IDS, New Delhi, and subsequently as the Chief Staff Officer (Operations) in Headquarters, Western Naval Command, Flag Officer Commanding Maharashtra Naval Area and Flag Officer Sea Training.

Vice Admiral Rajesh Pendharkar is a recipient of the AtiVishishtSeva Medal and VishishtSeva Medal for distinguished service.

https://pib.gov.in/PressReleasePage.aspx?PRID=1725087

पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Mon, 07 June 2021 5:32PM

वाइस एडमिरल राजेश पेंढारकर, एवीएसएम, वीएसएम ने महानिदेशक, नेवल ऑपरेशन्स के रूप में कार्यभार संभाला

वाइस एडमिरल राजेश पेंढारकर, एवीएसएम, वीएसएम ने आज 07 जून 2021 को नौसेना ऑपरेशन्स के महानिदेशक का पदभार ग्रहण कर लिया है। वह राष्ट्रीय रक्षा अकादमी, खड़कवासला, पुणे के पूर्व छात्र हैं, जिन्हें जनवरी 1987 में भारतीय नौसेना में कमीशन प्रदान किया गया था। वह डिफेंस सर्विसेज स्टाफ कॉलेज, वेलिंगटन, नेवल वॉर कॉलेज, करंजा और नेवल कमांड कॉलेज, न्यूपोर्ट, रोड आइलैंड, यूएसए से ग्रेजुएट हैं।

फ्लैग ऑफिसर पनडुब्बी रोधी युद्धकला (एएसडब्ल्यू) में विशेषज्ञ हैं एवं एएसडब्ल्यू अधिकारी के रूप में उन्होंने नौसेना के अग्रिम युद्धपोतों पर और बाद में गाइडेड विध्वंसक आईएनएस मैसूर के एग्जीक्यूटिव ऑफिसर एवं प्रिंसिपल वॉरफेयर ऑफिसर के रूप में कार्य किया है।

उन्होंने मिसाइल कार्वेट आईएनएस कोरा, मिसाइल फ्रिगेट आईएनएस शिवालिक और विमानवाहक पोत आईएनएस विराट की कमान संभाली है। वह आईएचक्यू, रक्षा मंत्रालय (नौसेना) में स्टाफ रेक्विरेमेंट डायरेक्टरेट, कार्मिक निदेशालय तथा नेट सेंट्रिक ऑपरेशन्स निदेशालय में महत्वपूर्ण स्टाफ अपॉइंटमेंट पर कार्यरत रहे हैं।

फरवरी 2016 में रीयर एडमिरल के पद पर पदोन्नति के बाद, उन्हें मुख्यालय आईडीएस, नई दिल्ली में असिस्टेंट चीफ ऑफ इंटीग्रेटेड डिफेंस स्टाफ (इंट - ए) के रूप में नियुक्त किया गया और बाद में पश्चिमी नौसेना कमान के मुख्यालय, में चीफ स्टाफ ऑफिसर (ऑपरेशन्स), महाराष्ट्र नेवल एरिया के फ्लैग ऑफिसर कमांडिंग और फ्लैग ऑफिसर, सी ट्रेनिंग नियुक्त किया गया।

वाइस एडमिरल राजेश पेंढारकर को उनकी विशिष्ट सेवा के लिए अति विशिष्ट सेवा पदक और विशिष्ट सेवा पदक प्रदान किया गया है।

https://pib.gov.in/PressReleasePage.aspx?PRID=1725148

नवभारत टाइम्स

Tue, 08 June 2021

वे नामुमकिन को कर देंगे मुमकिन, सेना में तैयार हो रही जांबाजों की एक ऐसी टुकड़ी

जनवरी 2019 में तत्कालीन आर्मी चीफ बिपिन रावत ने सेना में व्यापक सुधार और पुनर्गठन की बात कही थी। इसमें सेना की मारक क्षमता बढ़ाने की बात कही गई थी।

By Anil Kumar

हाइलाइट्स:

- *आईबीजी के सबसे पहले पाकिस्तान और चीन के बॉर्डर पर किया जाएगा तैनात*
- *एक ग्रुप में होंगे 5000 सैनिक, इंफेन्ट्री से लेकर एयर डिफेंस, सिगनल के होंगे एक्सपर्ट*
- *कम्पोजिट IBGs की कमान मेजर जनरल्स के हाथ में होगी, ये ब्रिगेड से बड़ी होगी*

नई दिल्ली: मॉडर्न वार में मास्टर इंटीग्रेडट बैटल ग्रुप अगले साल तक इंडियन आर्मी का हिस्सा हो जाएगी। इंडियन आर्मी ने अपनी पश्चिमी और पूर्वी सीमाओं की सुरक्षा के लिए 11 से 13 इंटीग्रेटेड बैटल ग्रुप बनाने और तैनात करने की योजना बनाई है। भारतीय सेना पाकिस्तान बॉर्डर पर इंटीग्रेटेड बैटल ग्रुप (IBG) तैनात करने करने को पूरी तरह तैयार है।

हर फील्ड के माहिर जवान होंगे शामिल

आईबीजी में अलग-अलग फील्ड के माहिर जवान होंगे। इसमें पैदल सैनिक, टैंक, तोप, इंजीनियर्स, लॉजिस्टिक, सपोर्ट यूनिट सहित वह सभी फील्ड के सैनिक एक साथ होंगे जो किसी भी युद्ध के लिए जरूरी हैं। अब तक यह सब अलग अलग यूनिट के तौर पर तैनात हैं और युद्ध के वक्त एक साथ आते हैं। प्रतिरक्षा हो या आक्रमण, युद्ध जैसी किसी भी स्थिति से तुरंत निबटने में यह दस्ता हर क्षण तत्पर रहेगा। आवश्यकता पड़ते ही तुरंत धावा बोल देना इसकी सबसे बड़ी खूबी है। यानी तैयारी या रणनीति बनाने के लिए कोई अतिरिक्त समय की इसे आवश्यकता नहीं पड़ेगी, बस आदेश मिलने की ही देर होगी।

फाइटरों को दी जा रही है स्पेशल ट्रेनिंग

सीमा से सटे हर क्षेत्र में दुश्मन के खतरे, वहां की भौगोलिक चुनौतियों और लक्ष्य (3टी- थ्रेट, टेरेन और टास्क) को ध्यान में रखकर इसके फाइटरों को स्पेशल ट्रेनिंग दी जा रही है। इस ग्रुप में परिस्थितियों के अनुकूल साजोसामान से भी सुसज्जित किया गया है। आइबीजी का आकार किसी भी सैन्य ब्रिगेड से बड़ा और किसी डिवीजन से थोड़ा कम होगा। इसमें शामिल अधिकारियों, जवानों की संख्या क्षेत्रीय और ऑपरेशन की आवश्यकताओं के अनुरूप तय की जाएगी। आइबीजी की कमान मेजर जनरल रैंक के एक अधिकारी के पास होगी और वह संबधित कोर के जीओसी के अधीन होगा।

टास्क और भौगोलिक परिस्थिति के हिसाब होगा ग्रुप

सबसे पहले 8 आईबीजी को 9 कॉर्प्स (योल हेडक्वार्टर), 17 कॉर्प्स, (पानागढ़) और 33 कॉर्प्स (सुकना) के अंतर्गत लाया जाएगा। आईबीजी ज्यादा मारक होगा और इसका ढांचा टास्क और भौगोलिक परिस्थिति के हिसाब से होगा। जैसे जहां रोड हैं वहां कंस्ट्रक्शन की जरूरत कम है तो वहां का ढांचा अलग होगा, रेगिस्तान में जहां रोड भी बनानी हैं वहां का ढांचा अलग।

आईबीजी का उद्देश्य जंग होने की स्थिति में प्रो-एक्टिव वॉर स्ट्रेटेजी या कोल्ड वॉर स्ट्रेटजी के तहत जल्द से जल्द एकजुट कर दुश्मन पर हमला करना है।

बदल गया है युद्ध का तरीका

आर्मी के एक सीनियर अधिकारी ने कहा कि वक्त के साथ परिस्थितियां बदली हैं और युद्ध का तरीका भी। अब हथियार सिस्टम ज्यादा घातक हो गए हैं और ज्यादा तकनीक आ गई हैं। युद्ध के मैदान की ट्रांसपेरेंसी भी बढ़ी है इसलिए अब दुश्मन को एक साथ बड़ा टारगेट देने का रिस्क नहीं लिया जा सकता। अब छोटे साइज की फॉर्मेशन ज्यादा सही रणनीति है। छोटा फॉर्मेशन होने पर वह जल्दी छुप सकता है और कम से कम नुकसान होगा।

https://navbharattimes.indiatimes.com/india/indian-army-to-set-up-new-integrated-battle-groups-for-offensive-punch-in-modern-warfare-by-2022/articleshow/83302828.cms

Tue, 08 June 2021

Navy Inducts 3 Indigenously-Built Advanced Light Helicopters

ALH MK III helicopters feature an array of systems previously seen only on heavier, multi-role helicopters of the Indian Navy, the Navy statement said

New Delhi: The Indian Navy Monday inducted three indigenously-built advanced light helicopters ALH MK III that would be used for maritime reconnaissance and coastal security.

The three helicopters, made by the Centre-run Hindustan Aeronautics Limited, were inducted at the Indian Naval Station (INS) Dega, Eastern Naval Command (ENC), in Visakhapatnam, an official statement said.

The three helicopters were inducted at Indian Naval Station Dega, Eastern Naval Command, Visakhapatnam

"With the induction of these maritime reconnaissance and coastal Security (MRCS) helicopters, the ENC got a major boost towards enhancing the capabilities of the force," the Navy's statement mentioned.

ALH MK III helicopters feature an array of systems previously seen only on heavier, multi-role helicopters of the Indian Navy, it noted.

"These helicopters are fitted with modern surveillance radar and electro-optical equipment, which enable them to undertake the role of maritime reconnaissance in addition to providing long-range search and rescue, both by day and night," it mentioned.

In addition to special operations capabilities, ALH MK III is also fitted with a heavy machine gun to undertake constabulary missions, it said.

A removable medical intensive care unit (ICU) is also fitted on ALH MK III helicopters to airlift critically ill patients, it noted.

"The helicopter also has a host of advanced avionics, making it truly an all-weather aircraft," it stated. The first unit of three ALH MK III helicopters were inducted in the Indian Navy on April 19.

https://www.ndtv.com/india-news/navy-inducts-three-indigenously-built-advanced-light-helicopters-alh-mk-iii-2458589

FINANCIAL EXPRESS
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Tue, 08 June 2021

Deadly 'Romeos' helicopters coming to India! Indian Navy to get first MH-60Rs

The pilots and ground crew from the Indian Navy are already in the US undergoing training. They will return with the new MH-60Rs

By Huma Siddiqui

The first three out 24 MH-60R Seahawks are expected to be delivered next month. Sources have confirmed to Financial Express Online that "Dates are in the process of being confirmed for delivering the helicopters to the Indian Mission in the US. After which they will be sent to India."

The pilots and ground crew from the Indian Navy are already in the US undergoing training. They will return with the new MH-60Rs.

For the balance of the helicopters, the delivery will be as per the timeline stated in the contract inked between the governments of India and US. The 24 helicopters are coming through the Foreign Military Sales (FMS) route and are for approximately USD 2.6 billion. These helicopters are going to help the Indian Navy play a critical role in the Indian Ocean Region (IOR).

According to officers, the Indian Navy is going to receive the fourth -generation MH-60Rs `Romeos' helicopters. (Photo Credit: Lockheed Martin)

What is Indian Navy going to get?

According to the contract, the package includes spare parts, air-to-ground weapons support and training of pilots and ground crew. The training is already going on as reported earlier.

Due to the global shut down in 2020 because of the COVID-19 pandemic, the process of training had been delayed. And once the world started opening gradually, the team left for the US to be trained.

When was the deal approved?

In 2020, the deal got the stamp of approval by the Cabinet Committee on Security (CCS) last year in February before the former US President Donald Trump's arrival in New Delhi.

Who spearheaded the talks for MH-60R?

The talks for these helicopters was spearheaded by Dr Vivek Lall, who was then the Vice President of Strategy and Business Development at Lockheed Martin. He has been credited to have played a very significant role in the military trade between US and India.

In an earlier interaction with Financial Express Online, Dr Lall had said about these helicopters that, "These helicopters will provide a vital capability for the Indian Navy in the Indo-Pacific region."

MH-60Rs `Romeos' Helicopters

According to officers, the Indian Navy is going to receive the fourth -generation MH-60Rs `Romeos' helicopters.

These helicopters are going to be loaded with torpedoes and missiles and these missiles are going to be used in anti-submarine roles.

The delivery of these helicopters will be completed in five years from the time the deal was inked.

As reported earlier, these helicopters will replace the British Sea King helicopters.

The Defence Acquisition Council had put its stamp of approval in 2018.

Eye in the Sky

MH-60Rs `Romeos' helicopters when combined with the already being operated Boeing's P8-I by the Indian Navy will help submarine hunting grow stronger when combined with these helicopters.

And soon the Indian Navy will be getting Sea Guardian Drones from the US based General Atomics.

Modifications

The US based Lockheed Martin Company will be modifying the helicopters as per Indian specifications. And these modifications will be carried out in Owego, New York; and Stratford, Connecticut, based facilities of Lockheed Martin.

What India is going to receive are three helicopters which were meant for the US Navy and is a naval version of Sikorsky UH-60 Black Hawk and a member of the Sikorsky S-70 family.

The modification will include the folding main rotor and a hinged tail, which will help in reducing the footprint on board the ships.

These helicopters have the capability of handling the anti-submarine warfare (ASW), anti-surface warfare (ASUW) operations. They can also be used in search and rescue (SAR), as well as combat search and rescue (CSAR), naval special warfare (NSW) insertion, vertical replenishment (VERTREP), and medical evacuation (MEDEVAC).

https://www.financialexpress.com/defence/deadly-romeos-helicopters-coming-to-india-indian-navy-gets-first-mh-60rs/2266520/

FINANCIAL EXPRESS
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Tue, 08 June 2021

Interoperability between P8I and MH-60R and Sea Guardian: Know more

Even as the Indian Navy is expecting the approval for High Altitude Long Endurance Drones from the US based General Atomics, six more P-8I Patrol aircraft from Boeing Company are expected later this year

By Huma Siddiqui

Even as the Indian Navy is expecting the approval for High Altitude Long Endurance Drones from the US based General Atomics, six more P-8I Patrol aircraft from Boeing Company are expected later this year. The Indian Navy is already in the midst of inducting four P-8Is which were contracted under the offset clause in 2016. As reported earlier these aircraft are part of the 312A Naval Air Squadron based at Arakkonam in Tamil Nadu.

Drones for the Indian Navy

According to sources, "When the next Defence Acquisition Council meeting takes place the deal for procuring 10+10+10=30 drones from the US based General Atomics is expected to be on the agenda. The 30 drones deal worth approximately USD 3 billion are for the three services."

The MQ-9 Reaper or Predator-B High Altitude Long Endurance (HALE) drones, have already been approved for sale to India by the US administration. The drones will have different configurations as the payloads for each service is different.

The Indian Navy is already using the P-8I for the carrying out anti-submarine warfare and surveillance. Image: Boeing Company

Last year the Indian Navy had leased two Sea Guardian drones from the US Company during the ongoing stand-off between the armies of India and China.

How will these drones help in the surveillance of the Indian Ocean Region (IOR)?

The Indian Navy is already using the P-8I for the carrying out anti-submarine warfare and surveillance, once the Sea Guardians are inducted, equipped with missiles and radars are going to further strengthen the Navy's maritime reconnaissance. With these drones the navy will be in a position to further expand it's monitoring of the IOR, and carry out surveillance of its coastal boundaries and assets.

How will these help the Indian Navy?

Eyes in the Sky is going to add more to Indian Navy's prowess in the sea. And, another critical aspect that needs to be highlighted is that the QUAD (the US, Japan, India and Australia) are already operating P-8I, and the MH-60R helicopters. India is not operating the MH-60R and is awaiting its arrival, interestingly, all the QUAD countries are interested in the Sea Guardian drones.

Interoperability

Once the Sea Guardians join the Navy, they will fly in sync with the P-8i, the MH-60R helicopters.

All the three are from the US based companies and since in 2018 both Indian and the US have inked the Communications Compatibility and Security Agreement (COMCASA), all the US origin platforms will get encrypted systems. This will further improve their capabilities, as this will take the interoperability between the three assets to the next level. And, when joint exercises take place not only with the US, but with the QUAD and the next Malabar exercise, the drills will be

Expert Views: Interoperability between P8I and MH-60R

Milind Kulshreshtha, C4I, tells Financial Express Online, "MH-60R are multi-mission maritime helicopters designed for Anti-Submarine Warfare (ASW) and Anti-Surface Warfare (ASuW) with the C4I capabilities. The operational capabilities of such airborne assets are enhanced multi-fold when they operate as a part of the Fleet Task Force at sea. These specialised helicopters have the capability to engage targets which are even over-the-horizon."

According to the C4I expert, "P-8Is themselves are an advanced airborne platform with in-built inter-operability capabilities, making them a multi mission aircraft with C4I based Concept of Operations. The P-8I aircraft possess air borne Anti-submarine Warfare (ASW) capabilities and can detect unknown submarines and ships lurking in the waters. It can also launch submarine detection sonobuoys (active and passive types) as part of ASW operations to even find the submarines which are below the water surface."

"In a well-coordinated manner, during the Fleet operations, P-8I and MH-60R can jointly provide the ASW screen cover to the fleet ships. ASW air assets are essential for any fleet moving on the high seas, else the Fleet ships are vulnerable to a surprise underwater attack by a stealth submarine of an adversary. The aviation units can open out to ranges which are farther beyond the warship's on-board sonars, and provide a better submarine detection probability. Thus, these air assets provide an ASW screen, with an intent to detect and neutralize any hostile submarine before it closes-in to a range conducive for it to fire a torpedo. For example, a P-8I can not only detect a target, but can classify and attack it by using on-board torpedoes and depth charges. The aviation units like P-8Is and MH-60R are platforms to not only detect subs, but also fire torpedoes to destroy them well before these targets even pop up on the sonar display of the fleet ships," Mr Kulshreshtha, explains.

Interoperability

"As the MH-60R helicopters can participate in operational missions as part of the Fleet Task Force deck launched assets, a digital communication over a secure encrypted data link channel is essential within the net-units. Hence, the Tactical Data Link between the participating warships/submarines of the Task Force and aviation assets is established. As and when the land launched P-8Is fly in to participate within the Fleet Task Force operations, a tactical data-link connection is established with the P-8I maritime aircrafts and this makes these aircraft a part of the net-units which is now controlled by the Flagship. With this, now the MH-60R and P-8Is can share the Common Operating Picture (COP) in real time manner so as to plan and execute missions with a shared objective, in close coordination with the warships of the Task Force. Thus, the Fleet Commander now has a better tactical picture to improve the effectiveness of the resources at his disposal at sea," he adds.

"When the Indo-US Communications, Compatibility and Security Agreement (COMCASA) to enable interoperability between U.S. and Indian Armed Forces shall be implemented, the MH-60R, P-8Is and Indian Navy warships would be able to operate as part of the digital network of the QUAD Navies, with NATO specified protocols compatible to US Link-22/Link-16 data link," he concludes.

https://www.financialexpress.com/defence/interoperability-between-p8i-and-mh-60r-and-sea-guardian-know-more/2266728/

INDIA TODAY

Tue, 08 June 2021

Lessons from Project 75

The Defence Ministry clears six P-75I submarines for the Indian Navy. What lessons it must learn from the P-75 Scorpene submarine project

By Sandeep Unnithan

New Delhi: On June 4, the Defence Acquisition Council (DAC) headed by Defence Minister Rajnath Singh cleared the acquisition of six Project 75 'India' class submarines for the Indian Navy. The Rs 43,000-crore contract will be awarded to a consortium of an Indian submarine builder and a foreign Original Equipment Manufacturer under the MoD's Strategic Partnership model.

It aims to give the navy a fleet of modern conventional submarines with greater endurance and capabilities than the present one. India's submarine fleet is ageing—the bulk of its 15 boats are over 25 years old. Its adversaries are boosting their underwater platforms—Pakistan will field 11 conventional submarines by the end of this decade.

Indian Navy officers on board during the commissioning ceremony of P-75 INS Karanj submarine into the Indian Navy, in Mumbai, on March 10, 2021; Shashank Parade/PTI

The P-75'I' contract will be awarded to MDL (Mazagon Docks Ltd) or Larsen &Toubro. The two firms will need to tie up with one of four submarine builders—France's Naval Group, Germany's ThyssenKrupp Marine Systems, Russia's Rosoboronexport (Rubin Design Bureau) and Spain's Navantia. The Indian Navy is to shortly issue Request for Proposals (RFPs) for this project, but given the tortuously slow MoD procedures, even a 2024 contract signing date seems optimistic. The aims of the P-75'I' project are lofty. The 'I' symbolises the attempt to give India the ability to design and produce submarines as part of a 30-year submarine building programme. The goal is to produce 24 conventional submarines by 2030 (now been reduced to 18). The MoD will also need to create an indigenous industrial ecosystem to support the building and maintaining of conventional submarines in India.

Here's what the MoD needs to keep in mind as it proceeds:

1. India has wasted millions in paying ToT (transfer of technology) fees to foreign OEMs but has not acquired the capability to design and build submarines.

India is the world's only major submarine-operating country that has not designed and built its own submarines. This is a glaring lapse for a country which inducted submarines over 50 years ago. Yet it was not for want of money. Over four decades, millions of dollars have been spent in obtaining submarine-building expertise from Germany, France and Russia. Yet for various reasons, the Submarine Design Group (SDG), the Indian Navy's inhouse design organisation, has failed to absorb the capability to design and develop an Indian submarine. In 1981, India signed a contract with West Germany's HDW to buy four Type 1500 conventional submarines but, more crucially, to acquire submarine-building knowhow. Project officials say the transfer of ToT from West Germany was comprehensive and the plan was to build the fifth and sixth submarines using completely indigenous submarine technology. The company was blacklisted in 1987 on suspicion of bribery, after four submarines had been delivered. In the late 1990s, it paid Russia for design knowhow to build the Arihant-class nuclear submarines. With the blacklist on HDW still on, India signed a contract with the Franco-Spanish consortium Armaris in October 2005 to buy six Scorpene conventional submarines. This contract included transfer of design knowhow. Three submarines are currently in service and three more are due to be delivered by 2023.

2. A need to audit Project 75

The defence ministry needs to carefully audit Project 75, the 'buy and make' order for six Scorpene submarines signed in October 2005. This is also critical not just because France's Naval Group, which supplied the Scorpenes, is also in the reckoning for Project 75'I' but also for one other important reason. Project officials say nearly 30 per cent of the Rs 19,000 crore contract cost went towards ToT. This meant that by the sixth Scorpene submarine, India should have been self-sufficient in designing and building submarines, the way it is now for warships. The P-75'I' would have then segued into a line of Indian designed submarines. This has clearly not happened. What did MDL do with the Transfer of Design Documents (TDD) it received from Armaris, the Franco-Spanish consortium (including DCNS--now Naval Group) that sold the Scorpenes. This TDD went from France to MDL and from the MDL to the DG SDG. It was never utilised. In the 1980s, HDW transferred to MDL all the design blueprints on thousands of microfilms, and microfilm readers were supplied to interpret those designs. These were not utilised because the firm was blacklisted.

3. Why was no indigeneous ecosystem created?

The original 2005 contract was between MDL and Armaris. If the MDL-Armaris contract was an ideal one and all the terms of the contract abided with, then MDL should have established an indigenous supply chain to source components from Indian suppliers. This did not happen. The cost of the contract escalated substantially when MDL-Procured Materials or MPM were added on to the contract. MPM was material that was procured for MDL by the French firm. Project officials say this is what subverted India's ability to indigenously source the items and manufacture. More than 60 per cent of the Scorpene, including the combat management system and sensors, are imported. Would the same be repeated with the P-75'I' contract?

4. Can Project 75 segue into the P75 'I'?

India currently operates three different types of conventional submarines from Russia, France and Germany. All three have separate training and spares and procurement. Each submarine has its own distinct build, maintenance and operational philosophy. Russian and French boats, for instance, are completely different in their power supplies, types of motors, control systems, operations and standard operating procedures. A bulk of India's conventional submarine fleet is over 25 years old and life extensions will see most of them in service for 15 more years. The P-75'I', therefore, offers a chance to stabilise the entire submarine line on an in-service platform, whether French, Russian or German. By 2023, the navy will operate six Scorpene submarines which will be in service until 2050 and beyond. Feedback from the current fleet of Scorpene submarines should inform the decision on the choice of the P-75'I'. Would a lengthened 'Super Scorpene' with additional sections for AIP (air-independent propulsion) and weapons be more cost-effective than a whole new class of submarines?

5. Can both industrial partners form a consortium to speed up submarine production?

MDL and L&T, the only two Indian shipyards with submarine-building experience, are national strategic assets. MDL has delivered two HDW Type 1500 submarines to the navy and three Scorpene submarines. L&T has fabricated hulls of four 6,000-tonne Arihant class nuclear-powered ballistic missile submarines at its facility in Hazira and integrated them at the Shipbuilding Centre in Visakhapatnam. The P-75 'I' contract will be placed on one shortlisted firm. The MoD could perhaps consider a consortium of both firms to produce the submarines to drastically cut down on delivery schedules. A linear build programme will see the six submarines delivered by 2036 at the earliest. Parallel production by MDL-L&T could halve this delivery schedule.

https://www.indiatoday.in/india-today-insight/story/lessons-from-project-75-1811982-2021-06-07

Press Information Bureau
Government of India

Ministry of Science & Technology

Mon, 07 June 2021 3:41PM

New eco-friendly process enhances fatigue life of aluminium alloy used in aerospace components

Indian Scientists have developed an environmental-friendly process, which can provide excellent corrosion resistance to the high-strength aluminium (Al) alloys extensively used in aerospace, textile, and automotive applications. It involves an electrochemical method for the production of an oxide film on the metallic substrate.

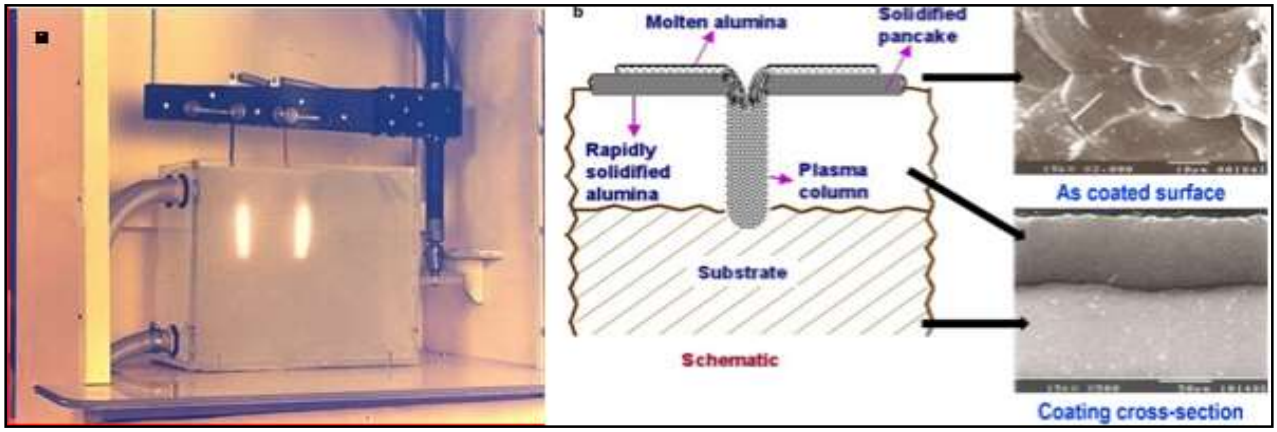


Fig. 1 (a) A close view of MAO reaction chamber while coating in progress and (b) coating deposition mechanism schematic along with typical MAO coating's surface and cross-sectional morphology

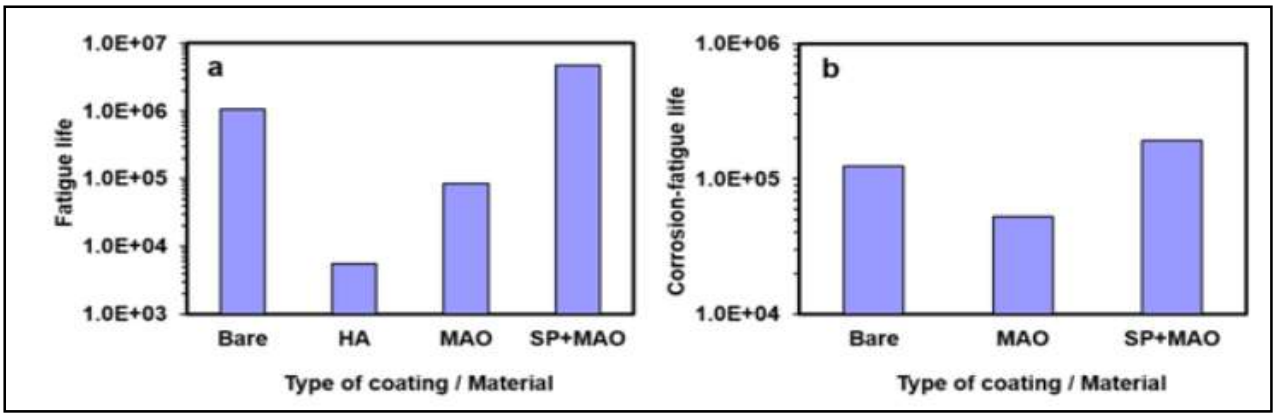


Fig. 2 Duplex treated MAO coatings exhibiting higher life under both (a) plain-fatigue and (b) corrosion-fatigue conditions as compared to un-treated Al alloy.

High-strength aluminium (Al) alloys are extensively used in aerospace, textile, and automotive applications owing to their low density and high specific strength. Aerospace components made out of Al alloys include landing gear, wing spar, which is the main structural part of the wing, fuselage (main body of an aircraft), aircraft skins or outer surface and pressure cabins. These parts often need resistance against wear, corrosion damages, and enhanced fatigue life. The widely used technique for Al alloys to improve corrosion resistance called hard anodizing (HA) process is an electrolyte-based coating deposition. It involves sulphuric/oxalic based electrolytes, which emits not only toxic fumes but are also hazardous to handle during processing.

In order to cater to the growing demand for cleaner industrial processes, an environmental-friendly process called micro-arc oxidation (MAO) has been developed at International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), an autonomous R&D Centre of the Department of Science and Technology, Govt. of India. The process which involves an alkaline electrolyte is capable of providing better wear and corrosion resistance compared to the HA process.

MAO is a high-voltage driven anodic-oxidation process, which through an electrochemical method, produces an oxide film on a metallic substrates. ARCI team has further designed and developed a duplex treatment of shot peening (process used to modify the mechanical properties of metals and alloys) followed by MAO coating deposition. Systematic investigations conducted at ARCI have shown that the duplex treatment has led to the remarkable enhancement in aerospace Al alloys' fatigue life while retaining the outstanding corrosion and wear resistance of MAO coating. The efficacy of duplex treatment has been validated for different Al alloys and extended to impart superior corrosion fatigue life. This work has been recently published in the *'International Journal of Fatigue'.*

The MAO process developed at ARCI has been patented in India and abroad. The team at ARCI has mastered the design and development of MAO systems of a lab (20 kVA), bench (75 kVA), and industrial (up to 500 kVA) scales to enable translating the technology from the R&D level to commercial production. As a logical extension, the custom-built technology systems were transferred to various industries and academic institutes in India. To cater to the aerospace segment, extensive research has been carried out at ARCI, and the high-cycle fatigue life of aerospace Al alloys under plain and simultaneous corrosion environments could be significantly improved.

The process with necessary modifications can be used for wear, corrosion, thermal, and fatigue and corrosion-fatigue life enhancement of a variety of components made out of Al, Mg, Ti, Zr, and their alloys.

Publications link: https://doi.org/10.1016/j.ijfatigue.2020.105965

https://pib.gov.in/PressReleasePage.aspx?PRID=1725059

पत्र सूचना कार्यालय
भारत सरकार

विज्ञान एवं प्रौद्योगिकी मंत्रालय

Mon, 07 June 2021 3:41PM

एयरोस्पेस घटकों में प्रयुक्त होने वाली एल्युमिनियम मिश्रधातु का जीवनकाल बढ़ाने हेतु नई पर्यावरण अनुकूल प्रक्रिया

भारतीय वैज्ञानिकों ने एक पर्यावरण अनुकूल प्रक्रिया विकसित की है, जो वायुयान निर्माण (एयरोस्पेस), वस्त्र उद्योग (टेक्सटाइल) और मोटर वाहन (ऑटोमोटिव) निर्माण कार्यों में व्यापक रूप से उपयोग की जाने वाली उच्च क्षमता वाली एल्युमिनियम मिश्र धातुओं को क्षरण से बचा सकती है। इसमें धातु सब्सट्रेट पर ऑक्साइड फिल्म के उत्पादन के लिए एक विद्युत रासायनिक विधि शामिल है।

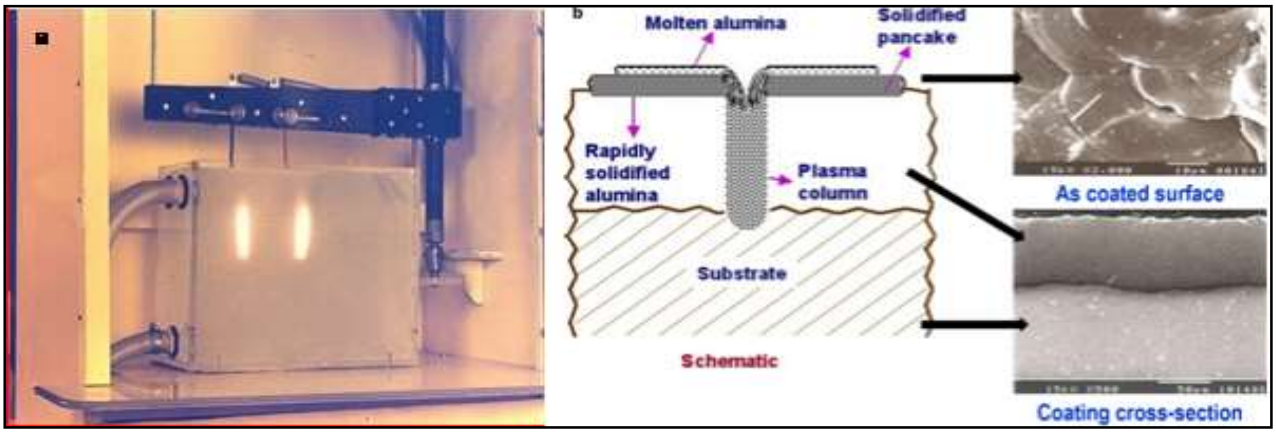
उच्च क्षमता (शक्ति) वाले एल्युमिनियम मिश्र धातुओं का उपयोग उनके कम घनत्व और उच्च विशिष्ट शक्ति के कारण वायुयान निर्माण (एयरोस्पेस), वस्त्र उद्योग (टेक्सटाइल) और मोटर वाहन (ऑटोमोटिव) निर्माण कार्यों में बड़े पैमाने पर किया जाता है। एल्युमिनियम मिश्रधातु (अलॉय से बने वायुयानों के घटकों (कल-पुर्जों) में लैंडिंग गियर, विंग स्पर, जो पंखों (विंग्स) का मुख्य संरचनात्मक हिस्सा है, धड़ (एक विमान का मुख्य ढांचा), विमान की बाहरी सतह (चादर) और प्रेशर केबिन शामिल हैं। इन भागों को अक्सर टूट-फूट, क्षरण (जंग) से होने वाले नुकसान, और मिश्रधातु के जीवनकाल से अधिक समय तक उपयोग के मद्देनजर प्रतिरोध की आवश्यकता होती है। एल्युमिनियम मिश्रधातुओं को क्षरण (जंग) से बचाने के लिए अधिकतर हार्ड एनोडाइजिंग (एचए) प्रक्रिया अपनाई जाती है जिसके अंतर्गत इस मिश्रधातु पर एक इलेक्ट्रोलाइट-आधारित परत चढ़ाई (कोटिंग की) जाती है। इसमें सल्फ्यूरिक/ऑक्सेलिक आधारित इलेक्ट्रोलाइट्स का प्रयोग करना शामिल हैं, जो न केवल जहरीले धुएं का उत्सर्जन करते हैं, बल्कि प्रसंस्करण के दौरान उनको संभालना भी जोखिम भरा होता है।

स्वच्छ औद्योगिक प्रक्रियाओं की बढ़ती मांग को पूरा करने के उद्देश्य से पाउडर धातुकर्म और नई सामग्री के लिए भारत सरकार के विज्ञान और प्रौद्योगिकी विभाग के अंतर्गत स्वायत्त संगठन अंतर्राष्ट्रीय उन्नत अनुसंधान केंद्र (एआरसीआई), माइक्रो-आर्क ऑक्सीकरण (एमएओ) नामक एक पर्यावरण-अनुकूल प्रक्रिया विकसित की है। इस प्रक्रिया में एक क्षारीय इलेक्ट्रोलाइट का प्रयोग शामिल है जो हार्ड एनोडाइजिंग (एचए) प्रक्रिया की तुलना में टूट-फूट और क्षरण से प्रतिरोध प्रदान करने में अधिक बेहतर ढंग से सक्षम है।

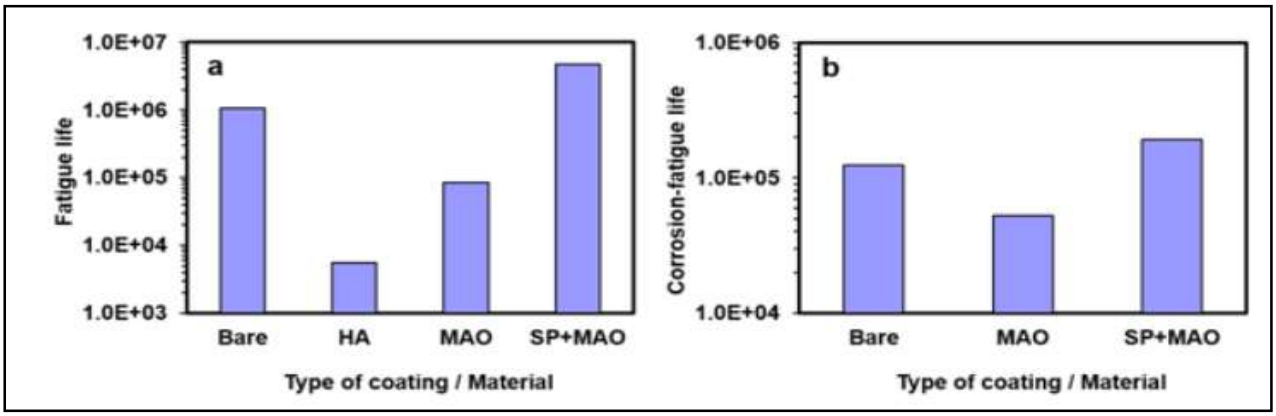
एमएओ एक उच्च-वोल्टेज पर की जाने वाली संचालित एनोडिक-ऑक्सीकरण प्रक्रिया है, जो एक विद्युत रासायनिक विधि के माध्यम से धातु सब्सट्रेट पर ऑक्साइड फिल्म बनाती है। एआरसीआई टीम ने शॉट पीनिंग के लिए एक डुप्लेक्स ट्रीटमेंट को और डिजाइन व विकसित किया है जिसके अंतर्गत धातुओं और मिश्र धातुओं के यांत्रिक गुणों को संशोधित करने के लिए इस्तेमाल की जाने वाली प्रक्रिया अपनाई जाती है और उसके बाद उन पर माइक्रो-आर्क ऑक्सीकरण (एमएओ) कोटिंग की जाती है। एआरसीआई में व्यवस्थित जांच से पता चला है कि डुप्लेक्स ट्रीटमेंट के बाद एमएओ कोटिंग करने से एल्युमिनियम मिश्रधातु से बने उपकरणों की टूट-फूट कम होने के साथ ही उनका क्षरण के प्रति प्रतिरोध भी बढ़ा है और उनका जीवनकाल भी उल्लेखनीय रूप से अधिक हो गया है। डुप्लेक्स ट्रीटमेंट की प्रभावकारिता को विभिन्न एल्युमिनियम मिश्र धातुओं के लिए मान्य किया गया है और इसे क्षरण से बेहतर बचाव और पुर्जों की जीवन अवधि बढ़ाने के लिए भी विस्तारित किया गया है। इस प्रक्रिया को हाल ही में 'इंटरनेशनल जर्नल ऑफ फैटिग' में प्रकाशित किया गया है।

एआरसीआई में विकसित एमएओ प्रक्रिया को भारत और विदेशों में पेटेंट कराया गया है। एआरसीआई की टीम ने (20 केवीए), बेंच (75 केवीए), और औद्योगिक (500 केवीए तक) की माइक्रो-आर्क ऑक्सीकरण (एमएओ) प्रणाली की प्रयोगशालाओं के डिजाइन और विकास में महारत हासिल की है ताकि अनुसंधान और विकास के स्तर से व्यावसायिक उत्पादन में प्रौद्योगिकी का सफलतापूर्वक उपयोग किया जाना सम्भव हो सके। तार्किक विस्तार के रूप में, कस्टम-निर्मित प्रौद्योगिकी प्रणालियों को भारत में विभिन्न उद्योगों और शैक्षणिक संस्थानों में स्थानांतरित कर दिया गया। वायुयान (एयरोस्पेस) निर्माण एयरोक्षेत्र की आवश्यकताओं को पूरा करने के लिए, एआरसीआई में व्यापक शोध किया गया है, और सामान्य एवं इसके साथ-साथ साथ क्षरण (जंग) के वातावरण को दुरुस्त करने के अंतर्गत अब एल्युमिनियम मिश्र धातुओं के उच्च-चक्र जीवन काल में काफी सुधार किया जा सकता है।

आवश्यक संशोधनों के साथ इस प्रक्रिया का उपयोग एल्युमिनियम, मैग्नीशियम, टाइटेनियम, जिर्कोनियम और उनके मिश्रधातुओं से बने विभिन्न घटकों के टूट-फूट, जंग, थर्मल और जीवनकाल को बढ़ाने के लिए किया जा सकता है।



चित्र 1 (अ) कोटिंग प्रगति के दौरान एमएओ रिएक्शन चैंबर का एक करीबी दृश्य और (ब.) विशिष्ट एमएओ कोटिंग की सतह और क्रॉस-सेक्शनल मॉर्फोलॉजी के साथ योजनाबद्ध कोटिंग जमाव तंत्र



चित्र 2- डुप्लेक्स ट्रीटेड एमएओ कोटिंग्स ये दोनों (क) सामान्य-जीवनकाल की समाप्ति (क्षरण) और (ख) गैर-उपचारित एल्युमिनियम मिश्र धातु की तुलना में क्षरण (जंग)-जीवन अवधि समाप्त होने की स्थिति में अधिक जीवनकाल का प्रदर्शन करते हैं।

प्रकाशन लिंक: https://doi.org/10.1016/j.ijfatigue.2020.105965
https://pib.gov.in/PressReleasePage.aspx?PRID=1725145

INDIA TODAY

Tue, 08 June 2021

Gaganyaan on track, ISRO to take final call on uncrewed launch once Covid lockdown is lifted in Bengaluru

Proposed in 2018, the mission has encountered several delays owing to the coronavirus pandemic

By Sibu Tripathi

New Delhi: The Indian Space Research Organisation (Isro) is on track to launch the uncrewed Gaganyaan mission, which is part of the space agency's ambitious project to send humans to space. The final call on the launch, likely in December, will be taken following assessment of the mission once the lockdown in Bengaluru is lifted, sources told IndiaToday.in.

Proposed in 2018, the mission has encountered several delays owing to the coronavirus pandemic. The Karnataka government had reimposed a lockdown earlier this year to contain the unabated spread of the virus. The lockdown is likely to be lifted by June 15.

The Gaganyaan Mission was proposed in 2019 by Prime Minister Narendra Modi. (Representative Photo/Isro)

"It is going fine, Covid-19 lockdown has had an impact but there is no delay as of now and once it is lifted the teams will meet and assess the situation before taking a final call," the source said.

The Gaganyaan mission is a three-stage project which will see two uncrewed module launches before the astronauts, who are undergoing training in Russia, embark on the historic journey. While the first launch is scheduled for December this year, the second uncrewed launch is likely to take place in 2022-23 after which the full-scale crew launch will take place.

In her Budget speech, Finance Minister Nirmala Sitharaman had said that the first unmanned launch is slated for December 2021.

The Covid-19 pandemic has played its part in delaying several other missions that were likely to be launched in 2021, the most important among them being the Aditya L1, which includes a satellite to study the Sun. Several other projects that are now delayed include three Earth observation satellites and two Small Satellite Launch Vehicles (SSLV).

"A lot of people are involved in the Gaganyaan mission, and we need to assess all core sectors working on the mission when the lockdown is lifted," the source added. The lockdown has led to only a small percentage of work being done due to remote operations.

Apart from the uncrewed module launch, Isro is also planning to launch a data relay satellite that will help maintain contact with the Gagangyaan mission. The Rs 800 crore has been approved and work is going on to launch the satellite that will help the Isro ground control establish contact with Gaganyaan throughout the mission.

The Rs 10,000 crore Gaganyaan Mission was first announced by Prime Minister Narendra Modi in 2018 and is likely to propel India in direct competition with the US and Russia which has so far dominated human space exploration.

https://www.indiatoday.in/science/story/gaganyaan-mission-uncrewed-module-launch-december-isro-covid-lockdown-1811859-2021-06-07

PHYS.ORG

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Generalizing the measurement postulate in quantum mechanics

The measurement postulate is crucial to quantum mechanics. If we measure a quantum system, we can only get one of the eigenvalues of the measured observable, such as position, energy and so on, with a probability. Immediately after the measurement, the system will collapse into the corresponding eigenstate instantly, known as state collapse. It is argued that the non-cloning theorem is actually a result of the measurement postulate, because non-cloning theorem would also hold in classical physics. The possibility of cloning in classical physics is actually the ability to fully measure a classical system, so that a classical state can be measured and prepared.

To explain clearly the measurement in quantum mechanics, it is better to use the following example. Suppose a photon passes through a three-identical-slits and we place an ideal and nondemolition detector after each of the slit. According to the measurement-postulate, one of the detectors will detect the photon, and as a result the whole wavefunction will collapse into that slit.

What will happen if we just place only a single detector after the upper slit? It is natural to think that it will have one third probability to detect the photon, and collapses the whole wavefunction into slit-1, as shown in Fig. 2. However, what will happen if the detector at upper slit does not measure the photon? This is a partial measurement. This was encountered in the duality quantum computing formalism, where linear combination of unitaries (LCU) was proposed to perform quantum computing.

Long proposed that when measuring a partial wave, something will surely happen: (1) collapse-in: it will collapse into one of the eigenvalues with some probability. After the measurement, the whole wavefunction will change instantly to the corresponding eigenstate; (2) collapse-out: the measured wavefunction will disappear, and shift to the unmeasured part. As shown in Fig. 2, the detector will measure the photon with probability 1/3, and the whole photon wavefunction collapses into the upper slit. As shown in Fig. 3 for collapse-out, the measured part in the upper slit disappears, and the unmeasured part, namely the wavefunction in the middle-slit and lower-slit increases.

In reality, partial measurement is more common than full measurement. It should be noted that collapse-in and collapse-out of partial measurement happens randomly not only in space, but also over time. For instance, the detection of photon by a detector can be naturally understood in terms of this partial measurement postulate. When the wavefunction of a photon goes to a detector, it is not measured in full at the same time, namely it is not a full measurement. Its front part arrives at the detector first, hitting some area of the detector. It either collapses in at any point of the intersecting area in the detector or collapses and the corresponding probability will be shifted to other part of the wavefunction. This process continues until the photon is detected. If the photon has not been detected until the last part of the wavefunction reaches the detector, then the amplitude of this remaining wavefunction increases to 1 so as to detect the photon with certainty at the final step. This explanation is given in the view that Wavefunction Is just the quantum system Entity itself, the WISE interpretation. In WISE interpretation, there is NO relation between the wavefunction and the quantum system, the wavefunction IS just the quantum system. The WISE interpretation is supported by the encounter delayed choice experiment, which has been reported in various media a few years ago.

More information: GuiLu Long, Collapse-in and collapse-out in partial measurement in quantum mechanics and its wise interpretation, *Science China Physics, Mechanics & Astronomy* (2021). DOI: 10.1007/s11433-021-1716-y

https://phys.org/news/2021-06-postulate-quantum-mechanics.html

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Remember Donald Trump-touted hydroxychloroquine? Study in India backs it as Covid-19 cure

Hydroxychloroquine, the malaria drug touted as a magical Covid-19 cure by former US President Donald Trump last year, has been found effective in a prophylactic study published in the Journal of The Association of Physicians of India

By Prabhash K Dutta

Hydroxychloroquine, the malaria drug touted as a magical Covid-19 cure by former US President Donald Trump last year, has been found effective in a prophylactic study published in the Journal of The Association of Physicians of India (JAPI) last week.

The study showed that hydroxychloroquine, popularly known as HCQ, could prevent SARS-CoV-2 infection in varying degrees depending on its dosing regimen. The highest prevention rate of 72 per cent was found among those given hydroxychloroquine over six weeks or a longer duration.

India is the world's leading supplier of HCQ. (File Pic)

The study said, "[W]hen adjusted for other risk factors, HCQ dose as per government recommendations, 2-3, 4-5, 6 or more weeks reduced the probability of Covid positivity by 34 per cent, 48 per cent and 72 per cent."

The study was conducted May-September last year when HCQ was still part of the Union health ministry's recommendation in treatment protocol for Covid-19.

Back and forth on HCQ

The study began against the backdrop of contesting claims made by authorities and experts including Donald Trump and his advisor Dr Anthony Fauci, the US's top infectious disease expert.

In March 2020, Donald Trump declared that hydroxichloroquine was a "game changer" drug in the fight against Covid-19. Dr Fauci dismissed the claim citing lack of study and evidence. Despite Fauci's counter-positioning, Trump continued to be vocal about taking HCQ as prophylactic drug.

Incidentally, the Union health ministry on June 6 dropped hydroxychloroquine from Covid-19 treatment protocol. In its nine-page guidelines released on Sunday (June 6) by the directorate of health services, hydroxychloroquine, ivermectin and favipiravir find no mention.

The government's decision came on the back of criticism by experts who pointed out a lack of study-based evidence to recommend hydroxychloroquine in Covid-19 cases. The government's revised guidelines, however, contradicts the recommendations made by the Indian Council of Medical Research as released on May 17.

The ICMR guidelines prescribed the use of hydroxychloroquine in mild cases of Covid-19.

Why this study matters

The authors of this prophylactic (relating to prevention of a disease) study said that this "is the largest multicenter study on HCQ prophylaxis on HCWs (healthcare workers), covering over 12,000 HCWs at the risk of Covid-19".

The study was conducted in May-September last year across 44 hospitals in 17 states involving hundreds of doctors, who received doses of hydroxychloroquine.

Here's what a researcher said

One of the co-authors of the study, Dr Raj Kamal Choudhry said, "In the 1985-86 edition of Harrison's Principles of Internal Medicine [a highly recommended book for students studying medicine in medical colleges], Dr Fauci wrote that HCQ worked an anti-viral agent despite being an anti-malarial drug. There was no Covid-19 back then. HCQ's anti-viral properties were known."

Dr Raj Kamal Choudhry, who was the nodal officer for the prophylaxis study of HCQ in Bihar's Bhagalpur medical college, said, "We had given about 2,700 doctors and paramedical staff, laundry and kitchen people the prophylaxis of HCQs in the dose of HCQs 400 mg 1×2 for first day then 1 tab daily for 4 days."

"We did not give to those who had palpitations and had QT prolongation [a measure of heart ailment]. Those who took this drug did not have Covid excepting 5 and 6. The effect was tremendous. Later, we gave this drug to all who had mild cases. Only those patients who were in ICU were not given."

"Of 2,700 people who were given HCQs, 700 were doctors. Only five or six got infected with SARS-CoV-2 in Bhagalpur but none developed serious complications, and nobody died of Covid-19," Dr Raj Kamal Choudhry told Indiatoday.in.

Incidentally, Donald Trump, who tested positive for Covid-19 in October, recovered fast from the coronavirus infection without showing any serious complication.

What the researchers recommend

In their conclusion, the researchers said, "HCQ is effective in reducing risk of Covid-19, at 800 mg loading and 400 mg weekly dose with more than 2 weeks dosing."

They said the HCQ was "well tolerated" among the participants. As policy implications of the study, the authors said, "Vaccine has its own limitations, and therefore an alternative strategy of prophylaxis such as HCQ is important, especially in low resource settings."

The outcome of the study is significant given that India is facing acute shortage of vaccine doses, and it is still likely to take a few months before availability of vaccines improves in the country. However, the decision on who could be advised to go for HCQ prophylaxis would require a relook by the Union health ministry and the ICMR

https://www.indiatoday.in/coronavirus-outbreak/story/remember-donald-trump-touted-hydroxychloroquine-study-india-backs-as-covid-19-cure-1811892-2021-06-07