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CONTENTS

Press Information Bureau
Government of India

Vice President's Secretariat

Sun, 02 Jan 2022 6:52PM

Vice President calls for making India self-reliant in all areas

Increase indigenous content in defence sector to cut down imports: VP

VP lauds scientists in defence, space & other sections for their excellent work

VP visits Naval Physical and Oceanographic Laboratory & addresses scientists

Shri Naidu lays the Foundation Stone of Towed Array Integration Facility virtually

VP dedicates Dr APJ Abdul Kalam Memorial

The Vice President, Shri M Venkaiah Naidu today called for making India fully self-reliant in all areas, including strategic domains.

Addressing scientists and staff of the Naval Physical and Oceanographic Laboratory at Kochi, the Vice President, stressed the need for increasing indigenous content in the defence sector and cutting down on imports.

"To achieve that, we need to not only give greater thrust to R & D activities, but also allow private collaboration, wherever it is possible and feasible, with stringent quality controls", Shri Naidu observed.

On this occasion, the Vice President virtually laid the foundation stone of the "Towed Array Integration Facility", essential for the development of towed array sonar systems, which is critical to underwater defence. The towed array sonar system is expected to enhance the Navy's capabilities to detect quieter enemy submarines underwater.

Asserting that India is strongly marching ahead on its way to becoming a global superpower in the coming decades, he lauded the scientists In defence, space and other areas for doing excellent work in strengthening India's security.

Referring to the fact that India is still one of the largest importers of defence equipment, the Vice President said, In this context, the contribution of a small lab like NPOL in empowering the nation in its defence needs is truly commendable.

Keeping in view the geo-political scenario in our neighbourhood, the Vice President said NPOL's role towards national security is paramount as all warships or conventional submarines in the fleet of the Indian Navy are installed with NPOL-developed sonars. "Besides bringing in the socio-economic gains by stopping imports in this niche domain, NPOL has been able to master a

very complex and critical technology that is giving a strategic edge to the Indian Navy in anti-submarine warfare capabilities", he added.

Lauding the laboratory for establishing itself as a leading Research & Development centre in the area of underwater surveillance systems, he noted that it is currently working on ambitious mission mode projects and technology demonstration projects, besides undertaking a major Flagship Programme, the Integrated Maritime Surveillance (INMARS) Programme for Indian Navy's future requirement for the next 15 years.

Appreciating NPOL for building strong network with industry and contributing towards improving financial performance of PSUs, the Vice President noted that

NPOL has also nurtured more than 100 local industries, including MSMEs and Start-ups, for developing niche technologies.

On the occasion, the Vice President also inaugurated Dr. APJ Abdul Kalam memorial and an installation on the occasion of Azadi ka Amrit Mahotsav near the laboratory. Describing the memorial as "truly befitting", he said that it will inspire countless people from all walks of life every day.

Governor of Kerala, Shri Arif Mohhammed Khan, Minister for Industries, Government of Kerala, Shri P. Rajeev, Member of Parliament, Shri Hibi Eden, Director General (Naval Systems & Materials), Dr. Samir V Kamat, Director, Naval Physical and Oceanographic Laboratory, Shri S Vijayan Pillai, Chief Staff Officer (Training), Headquarters, Southern Naval Command, Rear Admiral T.V.N. Prasanna and others were present on the occasion.

Following is the full text of the speech:

"Namaskaram! Good afternoon to you all!

I am pleased to visit Naval Physical & Oceanographic Laboratory (NPOL), a premier R&D establishment of the Defence Research and Development Organization and interact with all of you today.

Formed in the Southern Naval Command in 1952, NPOL later became part of DRDO in 1958. It will be celebrating its 70th year of inception in 2022. It is a matter of pride for the nation that during these last seven decades, NPOL has established itself as a leading Research & Development centre in the area of underwater surveillance systems.

I am told that NPOL-developed Sonar systems, which are the most critical equipment in the Anti-Submarine Warfare, have been fitted in all leading platforms of Indian Navy including ships, submarines and helicopters. The country's flagship technology achievement, the strategic submarine INS Arihant also carries NPOL-developed sonar system.

I understand that NPOL's services to the nation started with design and development of Hull Mounted Sonar systems for the Indian Navy's frontline Frigates and Destroyers. Today, NPOL has diversified the Research and Development area to Submarine Sonars, Airborne Sonars, Diver Detection Systems and Underwater Communication systems. I am happy to note that state of the art R & D facilities have been established and many new technologies in electronics and transducers have been developed.

With NPOL emerging as a leading and high performing R&D laboratory working in the area of underwater surveillance systems, Sonar systems developed by it are being used in Indian Navy's frontline platforms for last few decades and many of them have entered into third and even fourth generation products.

Dear sisters and brothers,

As you all know, India is strongly marching ahead well on its way to becoming a global superpower in the coming decades. In defence, space and other areas, our scientists from DRDO, ISRO, BARC and other leading R & D organizations are doing excellent work in strengthening India's security.

But it is also a fact that our country is still one of the largest importers of defence equipment. In this context, the contribution of a small lab like NPOL in empowering the nation in its defence

needs is truly commendable. I understand that the scientists here are working very closely with the Indian Navy, frequently sailing with them in ships and submarines in order to gain a deeper insight into their requirements and offer customized solutions. This is advantageous in four ways 1) The complete know-how and know-why, especially in critical areas like oceanography and transducer materials, remains exclusively with us and no foreign player can enter into the market easily; 2) These systems can be upgraded periodically with improvements; 3) Our scientists can address the problems of users in a quick and efficient manner, making maintenance and life time support of these systems easier; and 4) Most importantly, through indigenization of these systems, there will be a savings to the exchequer ranging from 20% to 75%.

I am glad to note that NPOL has also built strong relationship and network with industry for carrying out its charter of duties. The lab has been synergistically working with PSUs like BEL, KELTRON & HMT and is a key provider of technologies, contributing to their improved financial performance during the recent years. I am told that NPOL has also nurtured more than 100 local industries, including MSMEs and Start-ups, for developing niche technologies for underwater surveillance systems.

Keeping in view the geo-political scenario in our neighbourhood, I believe NPOL's role towards national security is paramount as all warships or conventional submarines in the fleet of the Indian Navy are installed with NPOL-developed sonars. Besides bringing in the socio-economic gains by stopping imports in this niche domain, NPOL has been able to master a very complex and critical technology that is giving a strategic edge to the Indian Navy in anti-submarine warfare capabilities.

I am informed that currently this laboratory is working on ambitious mission mode projects and technology demonstration projects, besides undertaking a major Flagship Programme, the Integrated Maritime Surveillance (INMARS) Programme for Indian Navy's future requirement for the next 15 years.

NPOL is also expanding its work to play a crucial role in establishing Underwater Domain Awareness for the nation.

Dear sisters and brothers,

Our mantra should be atma-nirbhartha—to make India fully self-reliant in all areas, including strategic domains. For instance, we need to keep increasing our indigenous content in the defence sector and cut down on imports. To achieve that, we need to not only give greater thrust to R & D activities, but also allow private collaboration, wherever it is possible and feasible, with stringent quality controls.

On this occasion, let me inaugurate the 70th Anniversary celebrations of NPOL. I am sure that NPOL will keep its flag soaring higher and higher by developing several critical technologies and provide solutions to the Indian Navy in protecting our long coast line. Today, as part of the government's Azadi Ka Amrit Mahotsav celebrations in connection with 75th year of Indian Independence, NPOL is commemorating a great visionary, Dr APJ Abdul Kalam, who rose from a humble background to become a great defence scientist and finally the president of the country. I feel honoured to dedicate Dr APJ Abdul Kalam Memorial to the nation. Dr Kalam's memorial in front of this great laboratory is truly befitting and I am sure that it will inspire countless people from all walks of life every day.

Namaskar! Jai Hind!"

https://pib.gov.in/PressReleasePage.aspx?PRID=1786957

THE HINDU

Mon, 03 Jan 2022

NPOL a world leader in underwater surveillance systems, says Venkaiah

Foundation stone for Towed Array Integration Facility laid

Kochi: Vice President M. Venkaiah Naidu laid the foundation stone of the Towed Array Integration Facility that is being set up at Naval Physical and Oceanographic Laboratory (NPOL), the sole DRDO laboratory in Kerala, at Thrikkakara near here on Sunday.

He was the chief guest at a function that was arranged in connection with the Azadi Ka Amrit Mahotsav initiatives at NPOL. Once completed, it is slated to become a state-of-the-art integration facility for long length flexible sensor arrays and cables, says an official release. The programme also witnessed the handing over of DHWANI acoustic trainer system developed by NPOL to the Indian Navy.

Vice President M. Venkaiah Naidu unveiling the statue of former President Dr. A.P.J. Abdul Kalam at the Naval Physical and Oceanographic Laboratory (NPOL). Governor Arif Mohammed Khan, Industries Minister P. Rajeeve, and Hibi Eden, MP, are seen.

The system would enable Indian Navy personnel, in a graded manner, to quickly advance their skills in interpreting and handling sophisticated readings from passive sonar, active sonar and underwater communication systems. The DHWANI system was handed over by Sameer V. Kamat, Director General, Naval Systems and Materials at DRDO, to Chief Staff Officer (CSO) (Training) of the Southern Naval Command Rear Admiral T.V.N. Prasanna.

The licensing agreements for the technology transfer of USHUS series of submarine sonars were also handed over by Mr. Kamat to the Director (R&D) of Bharat Electronics.

Kalam memorial

Mr. Naidu also formally inaugurated the Dr. A.P.J. Abdul Kalam Memorial erected on NPOL premises.

An Azadi Ka Amrit Mahotsav installation – which portrays some of the exemplary Sonar achievements of NPOL, too was inaugurated by Mr. Naidu.

NPOL lauded

In his address, Mr. Naidu said that he was very happy to see that NPOL has established itself as a world leader in the niche area of underwater surveillance systems and technologies.While appreciating the practice of NPOL personnel working very closely with the Indian Navy, often choosing to sail with them to understand the complexities of Naval personnel while in the field, the Vice President said the organisation has been able to master a very complex and critical technology that gives a strategic edge to the Indian Navy in anti-submarine warfare.

Governor Arif Mohammed Khan said that attaining self-reliance in the defence sector is of utmost strategic importance for the country, especially in the present geopolitical scenario. Director of NPOL S. Vijayan Pillai, Minister for Industries P. Rajeeve, Hibi Eden, MP, Director General of Advanced Technology Vessel Programme (ATVP) of the Indian Navy Vice Admiral (retd) K.O. Thakare, Director of Vikram Sarabhai Space Centre (VSSC) S. Somanath and Director of R&D at Bharath Electronics Limited (BEL) M.V. Raja Shekhar were among those present.

Mr. Naidu will leave from the Naval airport here on board an IAF aircraft on Monday evening, after a four-day visit to Kerala and Lakshadweep.

https://www.thehindu.com/news/cities/Kochi/npol-a-world-leader-in-underwater-surveillance-systems-says-venkaiah/article38093779.ece

NewsOnAIR

Sat, 01 Jan 2022

DRDO celebrates its 64th foundation day today

Defence Research and Development Organisation (DRDO) is celebrating its 64th foundation day today. It was on this day in 1958 when DRDO was formed to make India strong and self-reliant in terms of science and technology and especially in military technologies.

Defence Minister Rajnath Singh today wished to all Defence Research and Development Organisation, DRDO scientists and personnel on their 64th Raising Day. In a tweet, Mr Singh said, they are working tirelessly towards strengthening India's defence capabilities and making the country self-reliant in defence sector. He hoped that the DRDO scientists and personnel will keep serving the nation with the same zeal.

In the span of 63 years the organization has transformed the landscape of defence research and development in the country. Talking exclusively to All India Radio, the Chairman of DRDO Dr G. Satheesh Reddy said that the last year was the year of major breakthroughs and accomplishments even under the difficult situation posed due to COVID 19.

Talking about the role of DRDO in the fight against the COVID 19 pandemic, the DRDO Chief highlighted the front line tasks performed by his organisation in the fight against the disease. He said that over 850 oxygen plants have been set by DRDO with the help from PM CARES Fund and many COVID centric hospitals have been set up across the country, besides developing a medicine named 2DG.

Dr G Satheesh Reddy said the synergy with the defence industry in the country in terms of development and production has reached to new heights with over 175 transfers of technologies happened in last one year in 2021. On the issue of development of indigenous hypersonic cruise missile which was recently called upon by the Defence Minister Shri Rajnath Singh in a recent seminar of DRDO, the chairman said that his organisation is working rigorously to achieve hypersonic systems and also working on the fifth-generation advanced combat aircraft.

The DRDO Chairman informed that the organization has initiated significant steps in popularizing defence studies among students in the country.

Talking about Prime Minister Shri Narendra Modi's clarion call to make India Self Reliant or Aatm Nirbhar, the DRDO Chairman reiterated the commitment of his organisation to make the country world leader and net exporter in the field of defence research and production in coming years.

https://newsonair.com/2022/01/01/drdo-celebrates-its-64th-foundation-day-today/

वीर अर्जुन

Sun, 02 Jan 2022

डीआरडीओ ने 63 साल में देश को रक्षा क्षमताओं में बनाया आत्मनिर्भर: रक्षामंत्री

नई दिल्ली: रक्षा अनुसंधान एवं विकास संगठन (DRDO) **शनिवार को अपना** 64**वां स्थापना दिवस** (64th Foundation Day) **मना रहा है। आज ही के दिन** 1958 **में भारत** (India) **को विज्ञान और**

प्रौद्योगिकी (Science and Technology) और विशेष रूप से सैन्य प्रौद्योगिकियों (military technologies) के मामले में मजबूत और आत्मनिर्भर बनाने के लिए डीआरडीओ का गठन किया गया था।

रक्षा मंत्री राजनाथ सिंह ने आज डीआरडीओ के सभी वैज्ञानिकों और कर्मियों को उनके 64वें स्थापना दिवस पर शुभकामनाएं दीं। उन्होंने एक ट्वीट में कहा कि वे भारत की रक्षा क्षमताओं को मजबूत करने और देश को रक्षा क्षेत्र में आत्मनिर्भर बनाने की दिशा में अथक प्रयास कर रहे हैं। उन्होंने उम्मीद जताई कि डीआरडीओ के वैज्ञानिक और कर्मी इसी जोश के साथ देश की सेवा करते रहेंगे। उन्होंने कहा कि 63 वर्षों की अवधि में संगठन ने देश में रक्षा अनुसंधान और विकास के परिदृश्य को बदल दिया है।

डीआरडीओ के अध्यक्ष डॉ. जी सतीश रेड्डी ने कहा कि पिछला वर्ष कोरोना महामारी के कारण उत्पन्न कठिन परिस्थिति में भी बड़ी सफलताओं और उपलब्धियों का वर्ष था। महामारी के खिलाफ लड़ाई में डीआरडीओ की भूमिका के बारे में बात करते हुए उन्होंने कहा कि पीएम केयर्स फंड की मदद से 850 से अधिक ऑक्सीजन प्लांट स्थापित किए गए हैं। इसके अलावा 2डीजी नाम की देश की पहली ओरल ड्रग विकसित की। देश के कई राज्यों में कोरोना केंद्रित अस्पताल स्थापित किए गए हैं। डॉ. रेड्डी ने कहा कि पिछले एक साल 2021 में 175 से अधिक प्रौद्योगिकियों का हस्तांतरण हुआ है।

डीआरडीओ अध्यक्ष ने कहा कि उनका संगठन हाइपरसोनिक सिस्टम हासिल करने के लिए पांचवीं पीढ़ी के उन्नत लड़ाकू विमान पर भी काम कर रहा है। स्वदेशी हाइपरसोनिक क्रूज मिसाइल के विकास के मुद्दे पर हाल ही में डीआरडीओ ने एक सेमिनार भी बुलाई थी। डीआरडीओ अध्यक्ष ने बताया कि उनके संगठन ने देश में छात्रों के बीच रक्षा अध्ययन को लोकप्रिय बनाने के लिए महत्वपूर्ण कदम उठाए हैं। उन्होंने आने वाले वर्षों में देश को विश्व में अग्रणी और रक्षा अनुसंधान एवं उत्पादन के क्षेत्र में शुद्ध निर्यातक बनाने के लिए अपने संगठन की प्रतिबद्धता को दोहराया।

http://www.virarjun.com/category/national/news-1169945

THE HINDU

Sun, 02 Jan 2022

Govt. aims to make State electronics hub: Minister

Alappuzha: The Left Democratic Front (LDF) government aims to make Kerala an electronics production hub, Industries Minister P. Rajeeve has said.

He was speaking at a function organised to hand over a sonar array, which forms part of Mareech — an advanced anti-torpedo decoy system, manufactured by Kerala State Electronics Development Corporation Ltd (KELTRON) at Aroor in Alappuzha on Saturday.

N. Narayanamoorthy, chairman and managing director, Keltron, handing over a prototype of Mareech array to Naval Physical and Oceanographic Laboratory Director S. Vijayan Pillai at a function in Aroor in Alappuzha on Saturday. Industries Minister P. Rajeeve and A.M. Ariff, MP, are seen

Keltron produced the sonar array using the technology developed by the Naval Physical and Oceanographic Laboratory (NPOL) under the Defence Research and Development Organisation).

Mr. Rajeeve said the government would establish the electronics hub centred on Keltron.

"The State government is implementing various projects to strengthen the public sector. We are in the process of examining the master plans of public sector companies, including Keltron. Further steps will be taken in a timebound manner," the Minister said.

N.Narayanamoorthy, Chairman and Managing Director, Keltron, handed over a prototype of the sonar array to NPOL Director S. Vijayan Pillai.

Mareech is capable of detecting, locating, and neutralising incoming torpedoes.

https://www.thehindu.com/news/national/kerala/govt-aims-to-make-state-electronics-hub-minister/article38088296.ece

THE ECONOMIC TIMES

Mon, 03 Jan 2022

Rajnath Singh's Vietnam visit may add momentum to Brahmos plan

By Dipanjan Roy Chaudhury

Synopsis

Defence exports and joint collaboration including training and maintenance of defence equipment (both India and Vietnam use Soviet- and Russian-made defence equipment) could top the agenda of the three-day visit, ET has learnt. Vietnam is also interested in purchasing the Brahmos missile jointly produced by India and Russia.

Defence Minister Rajnath Singh will likely visit Vietnam in the second week of January to celebrate the golden jubilee of the establishment of diplomatic ties between New Delhi and Ho Chi Minh City.

Defence exports and joint collaboration including training and maintenance of defence equipment (both India and Vietnam use Soviet- and Russian-made defence equipment) could top the agenda of the three-day visit, ET has learnt. Vietnam is also interested in purchasing the Brahmos missile jointly produced by India and Russia.

Amid growing Chinese aggression in the ASEAN region, this is Singh's first trip to South East Asia since the pandemic.

Last year, Singh and his Vietnamese counterpart Sr Lt Gen Phan Van Giang held wide-ranging conversation on implementing the joint defence plan. During the virtual interaction, both ministers reviewed the progress on the current initiatives and expressed commitment to further enhance engagements between the defence forces of the two countries under the framework of India-Vietnam Comprehensive Strategic Partnership (2016) and under the guidance of the Joint Vision for Peace, Prosperity and People signed during the Virtual Summit between the prime ministers of the two countries in December 2020. Both the ministers acknowledged the significance of the Joint Vision Statement of 2015-20 in strengthening defence cooperation engagements between both the countries thus far.

The leaders had agreed to initiate measures to enhance cooperation in the defence industry and technology domain. In a series of tweets following the virtual meet, Singh had termed the relationship between India and Vietnam as "strong and effective". He had said: "India attaches great importance to its bilateral defence cooperation with Vietnam. Both India and Vietnam share a long-standing tradition of helping each other in difficult times. We have achieved substantial progress in defence industry cooperation in recent years."

India and Vietnam had upgraded their ties to the level of Comprehensive Strategic Partnership (CSP) in 2016 and President of Vietnam's National Assembly visited India in December to celebrate five years of CSP. India's $100 million defence Line of Credit to Vietnam has been utilised for naval equipment. India has been training Vietnamese military personnel and also helping them with maintenance of some defence products.

https://economictimes.indiatimes.com/news/defence/rajnath-singhs-vietnam-visit-may-add-momentum-to-brahmos-plan/articleshow/88652992.cms

NEWS 18

Sat, 01 Jan 2022

Explained: As Philippines eyes BrahMos deal, a look at the missile and India's defence exports game

By Kenneth Mohanty

The Philippines is on course to tie up a deal with India for the BrahMos cruise missile system, marking a significant step forward for New Delhi's ambitions as a defence exporter. Several other countries, too, are reported to be interested in acquiring the missile that India has jointly developed with Russia as New Delhi pursues the goal of emerging as a major seller of arms. Here's what you need to know.

WHAT'S THE DEAL PHILIPPINES IS PURSUING?

Reports say the Philippines is set to become the first foreign buyer of the BrahMos cruise missile system and has lined up funds to the tune of USD 55.5 million to cover the initial spend for the acquisition.

Per the Filipino department of budget management, the 'Shore-Based Anti-Ship Missile System Acquisition Project' is intended for supply to the Philippines navy and follows years of negotiations between New Delhi and Manila.

India and the Philippines are reported to have signed a framework agreement for government-to-government deals in the defence sector. While boosting strategic ties, the BrahMos sale is expected to also send out a signal to China vis-a-vis its aggressive stance in the South China Sea, where the Philippines has been disputing Beijing's maritime claims.

Reports say that several countries in Southeast Asia, including Thailand, Indonesia, Vietnam, have showed an interest in the land and sea-based versions of BrahMos. UAE and Saudi Arabia, too, are said to have explored a deal with Argentina, Brazil and South Africa also finding mention in a list of potential buyers.

WHAT IS THE BRAHMOS MISSILE?

BrahMos is a "short-range, supersonic anti-ship/land attack cruise missile" developed as part of a joint venture set up in 1998 between India's Defence Research and Development Organisation (DRDO) and the Russian NPO Mashinostroyeniya, says the Washington DC-based think tank Centre for Strategic and International Studies (CSIS). The name 'BrahMos' is derived from India's Brahmaputra and the Moskva river in Russia.

The missile can be launched from land, ships, submarines and aircraft with CSIS saying that, depending on the variant and the launch platform, BrahMos has a range of between 300-500 km. The payload size — ranging from 200-300kg — too, varies on the basis of the version as does the missile's launch weight, which can be anywhere between 2,200-3,000 kg. Reports said that the export version of the BrahMos will have a range of 290km to stay under the 300km ceiling imposed by the Missile Technology Control Regime (MTCR).

CSIS says that BrahMos is "distinguished" by its supersonic speed, flying at up to three-times the speed of sound at Mach 2.0-2.8 which, "in addition to making it difficult to intercept… also imparts a greater strike power". The makers of the missile say that the ability to travel at a speed of a "kilometre approximately in a second", BrahMos' combination of "supersonic speed and warhead mass provides high kinetic energy ensuring tremendous lethal effect". They add that BrahMos is the "only known versatile supersonic cruise missile which is in service".

BrahMos is also said to be equipped with stealth technology that makes it "less visible to radar and other detection methods", says CSIS.

A hypersonic version of the missile, BrahMos II, is also under development that would be able to hit speeds of over Mach 5. The defence ministry also recently said that BrahMos Aerospace has begun work BrahMos-NG, for 'next generation', which will be "a new, more advanced variant of the missile… having smaller, lighter and smarter dimensions", for deployment on a wider number of modern military platforms.

The BrahMos Integration Complex in Hyderabad is where the integration and assembly of mechanical systems and the electronics for the missile is undertaken along with the testing of the sub-systems fabricated in other centres in India and Russia.

In December 2021, a project to build a BrahMos Manufacturing Centre was inaugurated in Lucknow to produce the new BrahMos-NG. The defence ministry said that the new centre would be ready over the next two to three years and will produce between 80-100 BrahMos-NG missiles annually.

WHERE DOES INDIA STAND IN DEFENCE EXPORTS?

A report in March 2021 by the Stockholm International Peace Researcch Institute (SIPRI) said that data for the 2016-2020 period shows that India was, globally, one of the top-five arms importers. But the Centre has embarked on a strategy to reduce its arms imports by boosting domestic production. Giving a clear indication of its intentions, it has been issuing lists of defence sub-systems, components and hardware that it will no longer be importing, relying instead on domestic production to supply the said items.

Laying the foundation stone for the BrahMos centre in Lucknow, India's Defence Minister Rajnath Singh had said that the facility was a step in the 'Aatmanirbhar Bharat' direction with the "message of Make in India, Make for India and Make for World" having been sent out globally. An Observer Research Foundation (ORF) report says that New Delhi's goal is to step up on indigenous manufacturing so as to be able to achieve a short-term target of USD 5 billion from defence exports by 2025.

While India accounted for 9.5 per cent of the total value of global arms imports between 2016-2020 and was second in that regard to only Saudi Arabia, reports note that its imports actually fell by about a third from that in the 2011-2015 period. New Delhi's goal, the ORF report says, seems to be to "cut its dependence on other countries for defence systems across the board rather than to pivot from one supplier to the other".

In fact, the SIPRI report noted that India increased its share in total global arms exports from 0.1 per cent between 2011-2015 to 0.2 per cent between 2016-2020, a jump of 228 per cent. Myanmar, Sri Lanka, and Mauritius were the top destinations of Indian arms exports, ORF said. But India has a long way to go before establishing itself as a major arms exporter of the likes of the US, Russia, France, Germany or China, which together accounted for 76 per cent of all arms exports between 2016-2020. Further, ORF noted that New Delhi has to balance its arms exports push with those countries among the major exporters with whom India shares strategic ties.

An online resource says that in 2020, the US led the list of top exporters with arms sales amounting to over USD 9.3 billion followed by Russia, which earned USD 3.2 billion from weapons exports. France was third with sales of a little under USD 2 billion. India, in the same year, had exports amounting to USD 150 billion.

https://www.news18.com/news/explainers/explained-as-philippines-eyes-brahmos-deal-a-look-at-the-missile-and-indias-defence-exports-game-4613498.html

The EurAsian Times

Sun, 02 Jan 2022

Boosting Indian Navy's firepower, DRDO launches nuclear submarine with 'vertical launch system'

By Shreya Mundhra

Amid geopolitical tensions in the Indo-Pacific region, India has quietly launched its third Arihant-class nuclear-powered ballistic missile submarine — the S4 SSBN — at a secretive ship-building center in Visakhapatnam. The development was reported by Janes Defence Weekly, citing satellite imagery.

Arihant-Class Submarines

The Arihant-class, named after the country's first nuclear-powered submarine — INS Arihant — is a class of Indian nuclear-powered ballistic missile submarines that are being built for the Indian Navy.

It was launched at the Indian Navy's dockyard located in Visakhapatnam, the headquarters of Eastern Naval Command. The project, earlier called the advanced technology vessel (ATV), has been under development since 1998.

All the boats in the class, those that have been built, and those that are planned, share some common characteristics. The most obvious feature is the advantage these nuclear-powered submarines provide over conventional diesel-electric ones.

Diesel-electric submarines have to reach up to the surface every day to release carbon dioxide produced by the generator. On the other hand, nuclear-powered 80MW pressurized water reactor (PWR) submarines can stay underwater for long durations without the risk of detection.

The submarines in this class have been scarcely documented in photographs. An analysis of the images that are available confirms that a few aspects of these ships bear a strong resemblance to the Soviet-designed Kilo Class vessels. The upper sonar dome on top of the bow and multiple aspects of the sail look similar. The hull diameter also appears to match the Kilo-class subs.

Several of the Kilo-class vessels that are in service with India as the Sindhughosh-class submarines have been refitted with the DRDO-developed 'USHUS' sonar suites. It is likely that the Arihant's forward hull is similar to this class in order to leverage the USHUS sonar.

While the broad arrangement of the sonar system is the same as the Russian ones originally fitted to the Kilo, the intercept sonars positioned in the trailing edge of the sail are arranged one above the other.

Russia's Role in Indian Project

INS Arihant, which cost $2.9bn, was jointly developed by the Indian Navy, Bhabha Atomic Research Centre (BARC), and Defence Research and Development Organisation (DRDO) at the naval dockyard.

The process of building the vessel saw assistance from Russian designers as well. While Moscow's involvement in the program in designing the SSBNs and miniaturizing their reactors was an open, downplayed secret for a long period of time, it was only publicly acknowledged at Arihant's launch ceremony in July 2009 through the presence of the Russian naval design team and their country's then-ambassador V.I. Trubnikov.

Other firms were also involved in the development of the submarine. These were: Tata Power, a part of Tata Group, and Larsen & Toubro (L&T), a technology, engineering, construction, and manufacturing giant.

The designing and construction of the submarine were sanctioned using secret funds in the late 1970s by then-Prime Minister Indira Gandhi. This move came after India had conducted its first nuclear test in Pokhran.

The design and technology of INS Arihant were finalized when the official green signal was given in 1984. The work on the submarine began in 1998, with the construction by the Ship Building Centre (SBC) reaching completion almost 11 years later.

The original plan was to have four Arihant class submarines. However, this was reportedly altered by the United Progressive Alliance (UPA) government.

The plan then became to construct two Arihant class submarines, each with a displacement of 6,000 tonnes, and two more SSBNs of 7,000 tonnes displacement each. A key factor that differentiates the two larger ships— designated S4 and S4* at the shipbuilding center in Visakhapatnam — is that they are to have eight missile tubes instead of four.

Arihant and Arighat

INS Arihant was launched on July 26, 2009, by then-Prime Minister Manmohan Singh. Four years later, in August 2013, the submarine's atomic reactor was activated. Three more years down the line, in August 2016, Prime Minister Narendra Modi inducted the submarine into the Navy.

At the time of its induction, the Arihant was the longest submarine in the Indian Navy's fleet. It had a length of 110 meters and a breadth of 11 meters. This submarine can accommodate a crew of 95 and reach a speed of 12kt-15kt on the surface. Underwater, this top speed increases to a maximum of 24kt.

Arihant's exterior is uneven and its hull is placed on a mat laid over with tiles. The tiles assist in absorbing sound waves, thus providing stealth capability. The central part of the submarine's body consists of the outer hull and an inner pressurized hull.

The starboard side consists of two rectangular vents that draw in water when the submarine submerges into the sea.

INS Arighat is quite similar to Arihant and capable of carrying four nuclear-capable K-4 submarine-launched ballistic missiles (SLBMs) with a range of over 3,500 kilometers. Alternatively, it can carry 12 conventional warheads K-15 SLBMs with a range of about 750 kilometers each. The K-15 can also carry a strategic nuclear warhead.

This SSBN is currently awaiting commissioning which has reportedly been delayed.

The Latest Addition — S4 SSBN

In its December 29 report, Janes noted that the S4 SSBN was launched on November 23 and had been 'relocated' close to the 'fitting-out wharf' that was previously occupied by INS Arighat.

According to Janes, satellite imagery had confirmed that the ship being talked about stood at 7,000-tonnes, "slightly larger" than the lead ship in the Arihant class, INS Arihant.

It also has a load waterline measurement of 125.4 meters, compared with 111.6 meters of the 6,000-tonne Arihant and Arighat. Janes categorized the S4 – and successive boats – as 'Arihant-stretch' variants.

The magazine went on to infer that the satellite imagery indicated that the newly launched boats' increased length "accommodates expansion of the submarine's vertical launch system". This system can support eight missile launch tubes, as planned.

This would enable the SSBN to carry eight K-4 SLBMs, or alternately, 24 K-15 SLBMs. The K-4 SLBM is currently under development.

https://eurasiantimes.com/indian-navy-launches-3rd-arihant-class-nuclear-submarine/

The Statesman

Sun, 02 Jan 2022

Defence Ministry took major initiatives in 2021 to make India self-reliant

Defence Minister Rajnath Singh handed over five Defence Research and Development Organisation (DRDO) developed products to the armed forces and other security

New Delhi: Amid the ongoing border tensions with China and Pakistan, the Modi government launched several major initiatives during 2021 to make India self-reliant in the field of defence manufacturing.

"Atmanirbharta in Defence" became a major objective of the government as it gave an impetus to enhancing domestic manufacturing and making the country a net exporter in this field.

The year saw the induction of LCA (Tejas), Arudhra and Aslesha Radars, Astra Air to Air missile, Akash Surface to Air missile system, Advanced Light Helicopter and Light Combat Helicopter etc. systems into the IAF's inventory.

The MBT 'Arjun' Mk-1A was handed over to the Indian Army by Prime Minister Narendra Modi on 14 February and the Ministry of Defence (MoD) placed an order with Heavy Vehicles Factory (HVF), Avadi, Chennai for the supply of 118 Main Battle Tanks (MBTs) Arjun Mk-1A for the Indian Army.

Advanced Electronic Warfare System 'Shakti', designed and developed by Defence Electronics Research Laboratory (DLRL) Hyderabad, a laboratory of Defence Research and Development Organisation (DRDO), was handed over to the Indian Navy in November by the PM.

Indigenous Aircraft Carrier 'Vikrant' successfully accomplished its maiden sea voyage in August. This milestone with few parallels reinforces confidence in the largest indigenously designed platform of the Indian Navy and the resolve of countrymen in India's quest for 'Atmanirbahar Bharat'. Commissioning of Vikrant is being targeted by 15 August, 2022.

INS Visakhapatnam, the first ship of Project 15B, was delivered by Mazagon Dock Limited to the Indian Navy in October at Mumbai and commissioned into force in November by the Defence Minister.

Two sophisticated and potent platforms Karanj and Vela were commissioned in March and November respectively, with over 75 per cent of Indigenous content, having State-of-the-art weapon fit to strengthen the country's security apparatus in the Western Seaboard.

The forthcoming DefExpo-2022, scheduled to be held at Gandhinagar, Gujarat from 10 March, 2022, is being planned in line with "Azadi Ka Amrit Mahotsav" and the wide expanse of the domestic defence manufacturing industry will be co-opted to showcase India @75.

Defence Minister Rajnath Singh handed over five Defence Research and Development Organisation (DRDO) developed products to the armed forces and other security agencies at an event held at DRDO Bhawan, New Delhi on 14 December as part of "Azadi Ka Amrit Mahotsav" celebrations and the iconic week of the Ministry of Defence.

He also handed over six Transfer of Technology (ToT) agreements to seven public and private sector companies. Products handed over to the armed forces and the Ministry of Home Affairs include Anti-Drone system, Modular Bridge, Smart Anti Airfield Weapon, Chaff Variants and the Light Weight Fire Fighting Suit.

https://www.thestatesman.com/india/defence-ministry-took-major-initiatives-2021-make-india-self-reliant-1503035333.html

COVID 19: DRDO's Contribution

Hindustan Times

Sun, 02 Jan 2022

Set up makeshift hospitals: Centre to states as Covid cases surge

"States are advised to initiate creation of field/makeshift hospitals to augment availability of health infrastructure," health secretary Rajesh Bhushan said in a letter addressed to all the states and UTs.

By Rhythma Kaul

Delhi: With India witnessing a continuous rise in Covid-19 cases in the past 70 days, the Centre on Saturday advised states to start setting up makeshift hospitals to increase availability of beds, and create special teams to monitor home isolation cases.

"To address a potential surge in cases and ensure preparedness, states are advised to initiate creation of field/makeshift hospitals to augment availability of health infrastructure," health secretary Rajesh Bhushan said in a letter addressed to all the states and Union territories.

"The state administrations can take help from private sector, corporations and NGOs. This can be done in coordination with organisations like Defence Research and Development Organisation (DRDO) and Council of Scientific and Industrial Research (CSIR). This will aid the process of rapid creation of field hospitals or temporary hospital set-ups," the letter read.India on Saturday reported 26,663 Covid-19 cases, taking the overall tally to 34,887,184.

States have also been advised to consider using hotel rooms and other accommodations in sync with Covid-dedicated hospitals to cater to patients showing mild to moderate symptoms, as was done in some states earlier.

"It is imperative to re-emphasize the significance of timely upgrade in health infrastructure as with the sudden spike in Covid infections, we might witness increase in stress on health infrastructure," Bhushan said.

It is important for the states to monitor their home isolation protocol and its implementation at the field level, he said.

"Special teams should be constituted to monitor all home isolation cases. Call centres and control rooms should also aid in the outbound calling while monitoring such patients and ensure that such cases are shifted to an appropriate health facility via dedicated ambulances," he added.

"A mechanism wherein citizen can call and get ambulance and a bed in a transparent manner needs to be operationalised. The call centres, district or state level dashboards/portals can also help in organizing the same."

Bhushan said that the states are also requested to ensure that the existing Covid-dedicated health infrastructure is revisited and necessary action to ensure its operational readiness is taken.

"Focus should be maintained on rural areas and paediatric cases. States need to regularly review the availability of required logistics, oxygen availability and buffer stock of drugs across all health facilities," he said.

"Effective contact tracing coupled with quarantine of contacts, including facility quarantine for high risk and comorbid contacts, should be taken up at the earliest," the health secretary said.

"For a country like ours, even a small percentage would mean large numbers when talking in absolute terms," said Dr GC Khilnani, former head, pulmonary medicine department, All India Institute of Medical Sciences, Delhi, stressing on preparedness. "It is good to remain prepared."

https://www.hindustantimes.com/india-news/set-up-makeshift-hospitals-centre-to-states-as-covid-cases-surge-101641059700675.html

THE TIMES OF INDIA

Mon, 03 Jan 2022

DRDO's Covid hospital to be restarted in city

Varanasi: With a sudden, sharp rise in Covid-19 cases in the Varanasi and neighbouring districts in the past few days, officials have started making arrangements to tackle the pandemic and have even contacted the Defence Research and Development Organisation (DRDO) to restart its temporary Covid-19 hospital in the city.

Divisional commissioner Deepak Agrawal said, "The Covid-19 situation is still under control and there is no need for panic. But, as the figures of Covid-19 cases have started increasing in Varanasi and surrounding districts, we have intensified the efforts for reviving all arrangements which had helped in tackling the second wave.

Apart from ensuring Covid-19 facilities, the DRDO officials have also been contacted to operationalise the temporary Covid hospital with ICU facilities at the amphitheatre of Banaras Hindu University as a precautionary measure. The DRDO's team will be in the city by Tuesday."

The 500-bed DRDO temporary hospital — which was named Pandit Rajan Mishra Covid Hospital — was started for Covid patients at the amphitheater ground in May 2021 to meet the increased demand of the requirement of ICU beds as many critical Covid-19 patients needed level-2 and level-3 facilities. The Armed Forces Medical Services (AFMS) specialists, doctors, nursing and other medical staff, had been moved from across the country on a war footing to run the hospital in coordination with BHU and the civil administration. This facility of DRDO was closed after June 16, 2021, after the requirement of level-3 facilities decreased.

Another major focus of the officials is vaccination. The commissioner said, "The Covid-19 vaccine first dose coverage in Varanasi district is 95% while the average of four districts in the division is 80%. Now, focus is on mobilising people ,who have taken first dose, to get their second dose also."

The head of the Multidisciplinary Research Unit (MRU) of the Anatomy department of the Institute of Medical Sciences of BHU (IMS-BHU) Prof Royana Singh said, "The developments in the past 4-5 days are sufficient to increase worries as apart from Varanasi, Covid-19 cases are also increasing in Ghazipur and Chandauli. So far, no case of the new Omicron variant has been detected in this region. We will start genome sequencing for Omicron confirmation after collection of sufficient samples as this process is costly and additional lab technicians are required for it."

She said that instead of creating panic, people need to ensure safety by taking all precautions like wearing masks, sanitising hands, maintaining social distancing and consulting doctor immediately in case of noticing any symptom as these are the ways to check the spread of this pandemic and nipping the problem in the bud.

https://timesofindia.indiatimes.com/city/varanasi/drdos-covid-hospital-to-be-restarted-in-city/articleshow/88655298.cms

अमर उजाला

Mon, 03 Jan 2022

प्रधानमंत्री मोदी का मणिपुर और त्रिपुरा का दौरा तीन जनवरी को, जानिए राज्य को क्या देंगे सौगात?

सार

प्रधानमंत्री 2387 मोबाइल टावर जनता को समर्पित करेंगे और इंफाल में अत्याधुनिक कैंसर अस्पताल की आधारशिला रखेंगे। कोविड से जंग के लिए पीएम कियामगेई में डीआरडीओ के साथ मिलकर बनाए गए 37 करोड़ लागत वाले 200 बेड के अस्पताल का उद्घाटन करेंगे।

विस्तार

नई दिल्ली: प्रधानमंत्री नरेंद्र मोदी 4 जनवरी को मणिपुर और त्रिपुरा का दौरा करेंगे। पीएमओ ने बताया कि मणिपुर में वे 1850 करोड़ रुपये लागत वाले 13 प्रोजेक्ट का उद्घाटन करेंगे और 2950 करोड़ से शुरू होने वाले 9 प्रोजेक्ट की आधारशिला रखेंगे। त्रिपुरा में वे महाराजा बीर बिक्रम एयरपोर्ट की नई एकीकृत टर्मिनल इमारत का उद्घाटन करेंगे और दो महत्वपूर्ण विकास योजनाओं की शुरुआत करेंगे।

मणिपुर में प्रधानमंत्री जिन योजनाओं की आधारशिला रखेंगे, उनमें 1700 करोड़ लागत से पांच राष्ट्रीय राजमार्ग प्रोजेक्ट भी हैं। इनकी लंबाई 110 किलोमीटर से ज्यादा होगी। इससे इलाके में सड़क संपर्क बढ़ेगा। सिल्चर को इंफाल से सीधा जोड़ने के लिए राष्ट्रीय राजमार्ग-37 पर बराक नदी पर 75 करोड़ की लागत वाले स्टील ब्रिज का भी प्रधानमंत्री उद्घाटन करेंगे।

प्रधानमंत्री 2387 मोबाइल टावर जनता को समर्पित करेंगे और इंफाल में अत्याधुनिक कैंसर अस्पताल की आधारशिला रखेंगे। कोविड से जंग के लिए पीएम कियामगेई में डीआरडीओ के साथ मिलकर बनाए गए 37 करोड़ लागत वाले 200 बेड के अस्पताल का उद्घाटन करेंगे।

pm modi - फोटो : अमर उजाला

मणिपुर की समृद्ध संस्कृति से परिचित होगा हरियाणा

प्रधानमंत्री हरियाणा के गुरुग्राम में मणिपुर इंस्टीट्यूट ऑफ परफोर्मिंग आर्ट्स के निर्माण की आधारशिला भी रखेंगे। हरियाणा को मणिपुर की समृद्ध संस्कृति से परिचित कराने के लिए इस इंस्टीट्यूट की परिकल्पना वर्ष 1990 में की गई थी, लेकिन सालों तक इस दिशा में कोई काम नहीं हो सका। अब इसके निर्माण पर 240 करोड़ रुपये की लागत आएगी। इससे राज्य की संस्कृति को बढ़ावा मिलेगा और सांस्कृतिक विरासत और मजबूत होगी।

https://www.amarujala.com/india-news/pm-modi-visit-to-manipur-and-tripura-on-january-3-know-what-will-be-the-gift-to-the-state-latest-news-update

DRDO on Twitter

Vice President of India @VPSecretariat · 6h

The Vice President, Shri M. Venkaiah Naidu virtually laying the foundation stone of Towed Array Integration Facility at NPOL (DRDO) facility in Kochi today. @DRDO_India

Vice President of India @VPSecretariat · 6h

Keeping in view the geo-political scenario in our neighbourhood, I believe NPOL's role towards national security is paramount as all warships or conventional submarines in the fleet of the Indian Navy are installed with NPOL-developed sonars. @DRDO_India #NPOL

Vice President of India @VPSecretariat · 6h

The Vice President visiting the NPOL Acoustic Tank and Exhibition of NPOL products in Kochi today. @DRDO_India #NPOL

Vice President of India @VPSecretariat · 6h

The Vice President unveiling the plaque and inaugurating Dr. APJ Abdul Kalam Memorial and Azadi Ka Amrit Mahotsav Installation at NPOL (DRDO) facility in Kochi today. #APJAbdulKalam #AzadiKaAmritMahotsav

Rajnath Singh @rajnathsingh · Jan 1

Best wishes to all @DRDO_India scientists & personnel on their 64th Raising Day. They are working tirelessly towards strengthening India's defence capabilities and making the country self-reliant in defence sector. May they keep serving the nation with the same zeal.

> **DRDO** @DRDO_India · Jan 1
>
> On #64thDRDODay, we reaffirm to build #CuttingEdge systems & #AdvancedTechnologies for defence of the Nation. Our continuous endeavour is to fortify indigenous scientific & technological capabilities for #AtmaNirbharBharat - Dr G Satheesh Reddy & DRDO fraternity

DD News
@DDNewslive

Watch | Exclusive Interview with CEO and MD BrahMos Aerospace Atul Dinkar Rane

@BrahMosMissile #BrahMos

10:35 PM · Jan 2, 2022

DRDO @DRDO_India · Jan 1

On #64thDRDODay, we reaffirm to build #CuttingEdge systems & #AdvancedTechnologies for defence of the Nation. Our continuous endeavour is to fortify indigenous scientific & technological capabilities for #AtmaNirbharBharat - Dr G Satheesh Reddy & DRDO fraternity

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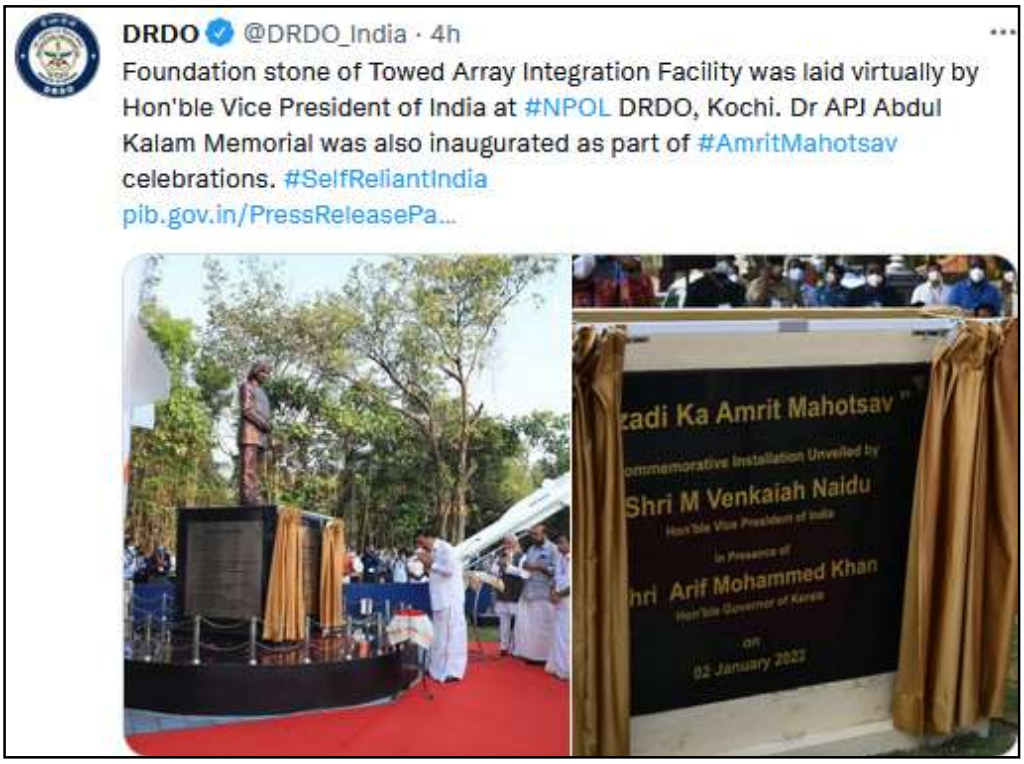
DRDO @DRDO_India · 6h

Hon'ble Vice President of India graced the #AmritMahotsav celebrations at #NPOL. His appreciation & continued encouragement will accelerate our journey towards #AtmaNirbharBharat.

@VPSecretariat



Defence News

Defence Strategic: National/International

THE HINDU

Mon, 03 Jan 2022

Venkaiah gets detailed brief on IAC Vikrant capabilities

Inaugurates a 50,000 litres water plant in Lakshadweep

Kochi: Vice President M. Venkaiah Naidu visited the Indigenous Aircraft Carrier (IAC) Vikrant that is being constructed at Cochin Shipyard Limited (CSL), on Sunday.

He was given a detailed brief of the vessel by Madhu S. Nair, Chairman and Managing Director of CSL, who explained about the yard's capabilities and strengths, it's contributions in developing indigenous technologies and in creating world-class capabilities. Indian Navy personnel too made a detailed presentation about the vessel and its capabilities.

Mr Naidu visited its hangar deck and the flight deck. He was accompanied by Governor Arif Mohammed d Khan, Industries Minister P. Rajeeve and Rear Admiral Antony George, Chief of Staff of the Southern Naval Command.

The Vice President was briefed on the uniqueness of the project and about efforts being made towards the ship's delivery and commissioning prior to August 2022, to commemorate 'Azadi Ka Amrit Mahotsav'.

He was appreciative of the nation's capability in designing and constructing the IAC and lauded it as a shining example of the country's quest for 'Atma Nirbharta' or self-reliant India.

Indian Navy is a formidable resident maritime power in the Indian Ocean Region and the Aircraft Carrier Battle Group remains central to its concept of operations. Vikrant will provide the Indian Navy with the requisite flexibility, mobility, reach and combat power in pursuance the country's national interests and also serve as a strong catalyst for peace and stability in the Indian Ocean Region, says a release.

Vice President M. Venkaiah Naidu with naval officers and other dignitaries during his visit to the first indigenous aircraft carrier, IAC Vikrant, in Kochi on Sunday. | Photo Credit: -

An aircraft carrier also holds a position of strategic and technological eminence, and is rightly considered the pinnacle in the domain of warship design and construction. With the construction of Indigenous Aircraft Carrier, India will enter into select band of countries having niche indigenous capability for designing and building of an aircraft carrier.

The Indian shipbuilding industry has come a long way since the 1960s, with IAC Vikrant being the hallmark of India's indigenous industrial capability. Its indigenous content in construction is close to 76% of the overall project cost of Rs.19,341 crore. Indigenous steel, equipment and systems manufactured by Indian industrial houses and about 100 MSMEs went into its making.

The indigenous construction of the carrier generated employment opportunities not only within the shipyard but also for many other industries supporting the project externally. This has resulted in a 'plough back' effect on the domestic economy. Close to 2,000 shipyard and 13,000 non-yard personnel were employed every year towards its construction, the pressnote says.

Lakshadweep

In Lakshadweep, he inaugurated a 50,000 litres per day capacity sea water reverse osmosis plant at Bangaram, which was commissioned by National Institute of Ocean Technology (NIOT) with the support of Lakshadweep PWD.

This is second of its kind plant commissioned by NIOT in these islands. The first plant with a capacity of 25,000 litres per day had been commissioned at Bitra Island in 2014-15. The flow rate of intake pumping system is around 5 litres per second, while the recovery ratio of the RO plant is around 25%. A system is in place to protect the eco system around the plant, says an official release.

https://www.thehindu.com/news/national/kerala/vice-president-visits-iac-vikrant/article38093124.ece

Business Standard

Sat, 01 Jan 2022

New HAL warfighting system removes need to send pilots into enemy airspace

Indian air power planners, however, have not entirely embraced this belief in autonomous warfare

By Ajai Shukla

New Delhi: Air power theorists have for some years broadly agreed that the days of manned aircraft are over, since too much planning, equipment and survival systems are needed to protect human crewmembers. Around the turn of the century, it was believed that the current, fifth generation of manned fighters – America's F-35 joint strike fighter; the Russian Sukhoi-35; the Chinese J-31 Shenyang and F-20 Chengdu and India's Advanced Medium Combat Aircraft (AMCA) – would be followed by unmanned drones that would be remotely directed to their targets, where their weapon-loads would be autonomously released.

Indian air power planners, however, have not entirely embraced this belief in autonomous warfare. In the Aero India 2021 air show last February one of the most eye-catching and thought-provoking displays was a glitzy, laser-lit, full-scale mockup in the Hindustan Aeronautics Ltd (HAL) stall that highlighted how the Indian Air Force (IAF) would fight the wars of the future.

This was dubbed the Combat Air Teaming System (CATS), a combination of manned and unmanned systems that will operate in tandem in wartime, reinforcing each other's strengths and capabilities.

Burned by the shooting down of a MiG-21 aircraft and the capture of its pilot after a dogfight over the India-Pakistan border in February 2019, CATS eliminates the need to send pilots into enemy air space. This eliminates the risk of their being shot down, captured and held hostage – events that can catapult a purely military operation into the political realm.

Instead, the CATS concept of operations involves manned aircraft functioning as airborne controllers of lethal, unmanned kill vehicles that swarm in numbers into enemy air space and overwhelm hostile defences.

The concept was presented by HAL to the IAF at the end of 2019. Top air force planners were interested enough to request an oversight role in the project. The first step agreed upon is the development of a "proof of concept", or an initial working prototype.

While the IAF is likely to offer funding at a later stage, HAL is currently funding the project with its internal resources.

In an exclusive visit to HAL's headquarters in Bengaluru, Business Standard was briefed on the CATS project.

The heart of the system is a manned "mothership" called the CATS-MAX. This is based on a manned two-seat fighter, such as the Tejas LCA (light combat aircraft) or the Sukhoi-30MKI, which flies as high as 45,000 feet, remaining inside our own airspace for safety. From the CATS-MAX, a single pilot, or a duo, controls operations through a data network with all the other elements of the system. The CATS-MAX will be a flying controller of all the other members of the system.

The strike power of CATS comes from four or more unmanned combat aeronautical vehicles (UCAVs), about the size of a Maruti 800 car, called the CATS – Warriors. These 1.6-tonne aircraft have low observability and fly autonomously at about 36-40,000 feet. In IAF jargon, these are called "loyal wingmen" and are armed with a variety of weapons and sensors depending upon the mission. The CATS – Warriors have a radius of operation of 300 km and endurance of two hours. Each CATS – Warrior is powered by two PTAE-W engines, which the DRDO developed indigenously for the Lakshya pilotless target vehicle (PTA).

The CATS-MAX would direct the CATS – Warriors, through secure data links, to strike ground targets up to 300 km inside enemy territory, retaining the range to fly back to base. Alternatively, the unmanned Warriors could also be sent on a suicide mission, 900-1000 km inside enemy territory, sacrificing themselves to gain added range.

"The cost of each Warrier is about Rs 40 crore, which could be written off depending upon the importance of the mission," said HAL's chairman, R Madhavan.

The third component of the system is called the CATS – Hunter. These are basically terrain-hugging, turbojet-powered missiles, with ranges of about 300 km that are carried on the mothership's wings. Once the mothership reaches its launch point, the Hunters are released and they fly out to distances of 200-300 km and execute their mission with 250-kg warheads.

The fourth component of CATS are called CATS-ALFA or Air Launched Flexible Assets. These are small swarm drones that the CATS – Warriors carry in multiple numbers in a canister called a "glide pod". They are launched about 200 km from their target, and, after gliding for about 100 km, the glide pod launches the ALFAs, which assume a swarm formation for a swarming attack and then travel another 100 km to strike the designated surface target.

The ALFAs are low-cost assets, with very little ammunition. The mothership can remain in our territory and launch the ALFAs deep into enemy territory to do the damage.

HAL is developing the ALFAs in partnership with a small, start-up firm. "The start-up firm, NewSpace Research and Technologies (NRT), is doing the ALFA; we are doing the glide pod," states the HAL chief.

The concept also visualises the CATS – INFINITY, a high altitude, pseudo-satellite that can be launched as a control vehicle and stay aloft for up to six months. It is powered by solar energy and has huge wings to accommodate the solar panels. This too is being developed in collaboration with NRT. The core of all this networking activity is a digital data link partnership. "We are currently developing this in HAL's Strategic Electronics Research and Design Centre (SLRDC) in HAL Hyderabad," said Madhavan.

https://www.business-standard.com/article/current-affairs/hal-s-new-warfighting-system-eliminates-need-to-send-pilots-to-enemy-space-121123101375_1.html

The Indian EXPRESS

Sat, 01 Jan 2022

BEL to export 3D naval radar internationally, says official

Though it is not revealed which countries have exhibited interest in the radar, the official stated that the international clients include France, Germany, the UK, Canada, Sweden and developing markets in Africa and South America.

By Aksheev Thakur

Bengaluru: Officials of the Bharat Electronics Limited (BEL) have said that international clients are on its roster for the export of L-Band 3D Air Surveillance Radar RAWL-03 manufactured by the defence public sector undertaking.

RAWL-03 antenna is compact and can be accommodated on wheeled vehicles and ships. (Special Arrangement)

"This is a cost effective Long Range Air Surveillance Radar perfect for early detection and tracking of air and surface targets, thereby enabling engagement of fire control systems to neutralise the targets. We want to market this to foriegn countries as well and the talks are on. The RAWL-03 comes in both ship and land-based configurations. We have showcased this to the Indian Navy and the process of induction is on. In 2018 we co-developed the radar with Swedish aerospace and defence company Saab," a senior official from the BEL said.

Though it is not revealed which countries have exhibited interest in the radar, the official stated that the international clients include France, Germany, the UK, Canada, Sweden and developing markets in Africa and South America.

The radar has an instrumentation range of 400 kilometers. "We can detect all sorts of air targets including missiles, helicopters and aircraft upto 400 kilometers. The radar provides three dimensional target data along with doppler data. The advantage of the 3D radar over 2D radar is its estimation of height of the target in addition to direction and range. We started working on this radar in 2015 and it took almost two years to realise its completion. It weighs around 4 tons and incorporates the latest Signal Processing techniques," he added.

RAWL-03 antenna is compact and can be accommodated on wheeled vehicles and ships.

BEL has also developed surface surveillance radar for detection and tracking of Sea Surface and air targets.

https://indianexpress.com/article/cities/bangalore/bel-to-export-3d-naval-radar-internationally-says-official/

Sat, 01 Jan 2022

India quietly launches 3rd Arihant-class Nuclear-powered Submarine, Can carry 8 Ballistic Missiles: Report

The first SSBN INS Arihant was commissioned in 2016, while the second, though initially launched in 2014, is awaiting commissioning into the Indian Navy.

New Delhi: India has launched its third Arihant-class a nuclear powered Submarine in Visakhapatnam. The low-key launch was reported by UK-based Janes Defence Weekly through satellite imagery from the Vishakhapatnam Ship Building Center.

TV grab of nuclear-armed submarine INS Arihant. (Image: News18)

The first SSBN INS Arihant was commissioned in 2016, while the second, though initially launched in 2014, is awaiting commissioning into the Indian Navy.

The Arihant class of Submarines is being built with help from Russia. According to the Janes Defence Weekly, the new boat, referred to as the S4, is slightly bigger than INS Arihant and can carry at least 8 K-4 ballistic missiles.

The magazine's December 29 report states that the S4 submersible ballistic nuclear submarine (SSBN) was launched on November 23 and had been 'relocated' to near the 'fitting-out wharf' that was currently occupied by INS Arighat, the second such nuclear-armed missile submarine. Arighat was launched in November 2014 and is currently awaiting commissioning, which has reportedly been delayed due to the ongoing COVID-19 pandemic, according to Janes. As a result, the launch of the S4 SSBN was not reported in the Indian press, the report said.

The British publication said the satellite imagery confirmed that the S4 SSBN, at 7,000 tonnes, was'slightly larger,' with a load water line measurement of 125.4m compared to 111.6m for the 6,000-tonne INS Arihant, the lead boat in this class. The S4 – and subsequent boats – were labelled as 'Arihant-stretch' variants.

According to the magazine, the additional length of the newly launched boats 'accommodates expansion of the submarine's vertical launch system, which has doubled to support eight (missile) launch tubes.' This, it said, would allow the SSBN to carry eight K-4 submarine-launched ballistic missile (SLBM) missiles or 24 K-15 SLBMs with strike ranges of 3,500 km and 750 km, respectively.

https://www.news18.com/news/india/india-quietly-launches-3rd-arihant-class-nuclear-powered-submarine-can-carry-8-ballistic-missiles-report-4610366.html

Hindustan Times

Sat, 01 Jan 2022

Navy to test Rafale-M jet for INS Vikrant

The Rafale-M fighter will be pushed through an intensive trial to assess whether it is best suited for IAC-1.

By Shishir Gupta

New Delhi: With countdown already begun to commission indigenous aircraft carrier 1 as INS Vikrant in August 2022, the Indian Navy will conduct flight trials of Rafale-Maritime fighter at Shore Based Test Facility at INS Hansa in Goa on January 6 onwards as part of its exercise to identify the best warplane to suit the 40,000 tonne carrier. The IAC 1 is based at Cochin shipyard and is currently undergoing intensive sea trials in Arabian Sea and Indian Ocean.

According to officials in knowledge of the matter, the Rafale-M fighter will be pushed through intensive trial at the 283 metre mock-up ski jump facility at INS Hansa for nearly 12 days to assess whether the fighter aircraft is best suited for IAC-1. The Rafale M fighter is the principal weapon system for French Charles De Gaulle aircraft carrier and has also shown its inter-operability with US aircraft carriers way back in 2008.

Rafale Maritime Strike fighter taking off from an aircraft carrier.

The Indian Navy is also planning to test US F-18 Hornet fighter at the same facility apparently in March as the alternative option to Rafale-M fighter. The Boeing F-18 is a proven carrier based multi-role fighter for the US Navy and has performed strike operations from way back to 1991 Gulf War.

While the Indian Navy operates two squadrons of MiG-29K onboard its sole aircraft carrier INS Vikramaditya, the Russian aircraft is facing issues of maintenance and spare parts availability.

The DRDO's LCA-M is still in the development stage with two single engine demonstrator fighters being flight tested from INS Vikramaditya and the Goa based shore based test facility for providing inputs to the final twin engine deck based carrier fighter in future. According to Aeronautical Development Agency, the first flight trial of the indigenous twin engine fighter is expected before 2026 and induction into Indian Navy before 2031.

While the decision on which fighter will spearhead IAC-1 will be based on the flight trials, fact is that Rafale-M is lighter and smaller in airframe to F-18 and packs a bigger punch than its American counterpart in terms of longer range air to air missiles and air to land missiles. Naval Aviation experts also say that it will be require structural modifications to the IAC 1 to fit F-18 into the lift to cart the fighter from hanger to the flight deck above due to its comparatively larger airframe.

As the IAC -1 is expected to commissioned as INS Vikrant on August 15, 2022, the 75th year of Indian independence, by Prime Minister Narendra Modi, there is a strong possibility that the Indian Navy may ask the French manufacturers of the aircraft to lease four to five Rafale -M in 2022 so that the aircraft carrier is made operational. India already has a maintenance cum flight training facility of Rafale at Ambala air base. The Naval aviators will be trained at INS Hansa.

https://www.hindustantimes.com/india-news/india-set-to-conduct-trials-of-rafale-fighter-s-naval-version-101640980226180.html

ThePrint

Sat, 01 Jan 2022

Army to introduce new combat uniform this month, with digital disruptive patterns & more comfort

Designed by NIFT, the uniform will be first showcased during the Army Day Parade on 15 January. It will be issued to officers and soldiers in batches in 2022.

By Snehesh Alex Philip, Edited by Saikat Niyogi

New Delhi: The Army is set to don a new combat uniform starting later this month, featuring digital disruptive patterns.

The digital disruptive patterns on the Army's new combat uniform | By special arrangement

The uniform, designed by the National Institute of Fashion Technology (NIFT) in close coordination with the Army, seeks to make soldiers more comfortable and is also operationally friendly.

Sources in the defence and security establishment told ThePrint that the plan is to have an open tender, with participation of both private and state-owned entities, for manufacturing and supply of the new camouflages or battle dress uniforms (BDU).

They said that while the uniform will be first showcased at the Army Day Parade on 15 January, it will start getting issued to officers and soldiers in batches.

Unlike the current practice, wherein the soldier can buy cloth from the market and get his uniform stitched, the new disruptive-patterned cloth won't be available in the open market.

"The plan is to ensure that it is not available in the open market. There would be a tendering process and the uniforms would be stitched in various sizes, just like in the case of readymade garments, which would then be supplied to various units and formations," a source said.

The defence sources added that the tendering process for making uniforms for the nearly 13 lakh-strong Army will be open to both private and state-run enterprises.

The Army had earlier requested the Union defence and home ministries to issue guidelines against the wearing of combat uniforms by police and paramilitary forces while handling law and order situations, or in urban areas affected by terrorism.

Same colour percentage as earlier

The new uniform will maintain the same colour percentage as in the present uniform, which is a mix of colours and shades, including olive and earthen.

As reported by ThePrint, unlike the current style, there will be no tucking in of shirts.

The trousers will have additional pockets for the ease of the soldier. The material chosen for the cloth is meant to be "lighter but sturdier" and suitable for both summer and winter.

It was not immediately clear whether the new combat uniform will have shoulder and collar tags like the present one, or blackened ones for better camouflage.

Also, the shoulder stripes — denoting rank — could be moved to the front buttons, a pattern followed by other major armies as well.

https://theprint.in/defence/army-to-introduce-new-combat-uniform-this-month-with-digital-disruptive-patterns-more-comfort/792476/

INDIA TODAY

Sun, 02 Jan 2022

S-400 missile system to be first deployed in Punjab by February

The Indian Air Force will complete the deployment of the first regiment of S-400 at an airbase in Punjab by February.

The Indian Air Force is likely to complete the deployment of the first regiment of the S-400 Triumph missile system at an airbase in Punjab by February, military officials said on Saturday. They said the process of deployment of the missile system has begun and it will take at least six more weeks to complete the deployment.

India had earlier started deploying its S-400 air defence system in the Punjab sector.

The first regiment of the missile system is being deployed in such a way that it can cover parts of the border with China in the northern sector as well as the frontier with Pakistan.

"The transportation of various critical components of the missile systems as well as its peripheral equipment to the site of the deployment is going on," said an official. In total, India will get five units of the S-400 air defence missile systems from Russia.

In October 2018, India signed a USD 5 billion deal with Russia to buy five units of the S-400 air defence missile systems, despite a warning from the Trump administration that going ahead with the contract may invite US sanctions.

The Biden administration has not yet clarified whether it will impose sanctions on India under the provisions of the Countering America's Adversaries Through Sanctions Act (CAATSA) for procuring the S-400 missile systems.

The CAATSA, which was brought in 2017, provides for punitive actions against any country engaged in transactions with Russian defence and intelligence sectors. The US has already imposed sanctions on Turkey under the CAATSA for the purchase of a batch of S-400 missile defence systems from Russia. Following the US sanctions on Turkey over the procurement of S-400 missile systems, there were apprehensions that Washington may impose similar punitive measures on India.

Russian Foreign Minister Sergey Lavrov said last month that the S-400 missile defence deal between India and Russia has a very important meaning for the Indian defence capability and it is being implemented despite the US attempting to "undermine" the cooperation.

https://www.indiatoday.in/india/story/iaf-complete-deployment-first-regiment-400-airbase-punjab-february-1894941-2022-01-02

ZEENEWS हिंदी

Sun, 02 Jan 2022

चीन-पाक के खिलाफ भारत को मिला 'महाबली' शस्त्र, पंजाब में होने जा रही तैनाती

पाकिस्तान (Pakistan) और चीन (China) के खिलाफ भारत अब आक्रामक ढंग से बचाव की तैयारी में लगा है। भारत ने अब ऐसा 'महाबली' हथियार हासिल कर लिया है, जिसके बाद वह चीन और पाकिस्तान को जंग में करारा जवाब दे सकेगा।

By Amit Bhardwaj

- ***6 सप्ताह में हो चालू होगा S-400***
- ***मल्टिपल टारगेट्स को करता है डिटेक्ट***
- ***400 किमी तक बना देता है सुरक्षा घेरा***

चंडीगढ़: पकिस्तान (Pakistan) के नापाक इरादों पर पानी फेरने के लिए भारत ने दुनिया के सबसे एडवांस एयर डिफेंस सिस्टम रूस के S-400 की तैनाती की तैयारी शुरू कर दी है। इसकी पहली खेप में मिले सिस्टम को इंडियन एयर फोर्स (Indian Air Force) अगले महीने पंजाब के एक एयरबेस पर तैनात करेगी। इसके लगने से पाकिस्तान की सीमा पर किसी भी नापाक कोशिश को नाकाम किया जा सकेगा।

6 सप्ताह में चालू होगा S-400

सूत्रों के मुताबिक इस सिस्टम को पूरी तरह लगाने में कम से कम छह सप्ताह और लगेंगे। मिसाइल सिस्टम की पहली रेजिमेंट को इस तरह से तैनात किया जा रहा है कि जिससे उत्तरी क्षेत्र में चीन (China) की सीमा के कुछ हिस्सों के साथ पूरे पाकिस्तानी बॉर्डर को कवर किया जा सकेगा।

दुनिया के सबसे आधुनिक एयर डिफेंस सिस्टम माने जाने वाले S-400 से हवा में भारत की ताकत अभेद्य हो जाएगी। ये सिस्टम 400 किलोमीटर की रेंज में दुश्मन की मिसाइल, ड्रोन और एयरक्राफ्ट को हवा में ही नष्ट कर सकता है। इसमें सुपरसोनिक और हाइपरसोनिक समेत 4 तरह की मिसाइलें शामिल हैं। जो 400 किमी तक निशाना भेदने में अचूक हैं। इसे दुनिया का सबसे एडवांस डिफेंस सिस्टम माना जाता है।

मल्टिपल टारगेट्स को करता है डिटेक्ट

S-400 की सबसे बड़ी खासियत इसका मोबाइल होना है। यानी, रोड के जरिए इसे कहीं भी लाया ले जाया जा सकता है। इसमें 92N6E इलेक्ट्रॉनिकली स्टीयर्ड फेज्ड ऐरो रडार लगा हुआ है जो करीब 600 किलोमीटर की दूरी से ही मल्टिपल टारगेट्स को डिटेक्ट कर सकता है। सबसे बड़ी बात यह है कि यह सिस्टम कमांड मिलने के 5 से 10 मिनट में ही ऑपरेशन के लिए रेडी हो जाता है। एस-400 की एक यूनिट से एक साथ 160 ऑब्जेक्ट्स को ट्रैक किया जा सकता है।

400 किमी तक बना देता है सुरक्षा घेरा

एक टारगेट के लिए 2 मिसाइल लॉन्च की जा सकती हैं। भारत को जो सिस्टम मिल रहा है, उसकी रेंज 400 किलोमीटर है। यानी, ये 400 किलोमीटर दूर से ही अपने टारगेट को डिटेक्ट कर काउंटर अटैक कर

सकता है। साथ ही यह 30 किलोमीटर की ऊंचाई पर भी अपने टारगेट पर अटैक कर सकता है। इस डिफेंस सिस्टम में सर्विलांस रडार लगा होता है, जो अपने ऑपरेशनल एरिया के इर्द-गिर्द एक सुरक्षा घेरा बना लेता है। जैसे ही इस घेरे में कोई मिसाइल या दूसरा वेपन एंटर करता है, रडार उसे डिटेक्ट कर लेता है और कमांड व्हीकल को अलर्ट भेज देता है। अलर्ट मिलते ही गाइडेंस रडार टारगेट की पोजिशन पता कर काउंटर अटैक के लिए मिसाइल लॉन्च करता है।

भारत-रूस में 40 हजार करोड़ की डील

भारत ने रूस से S-400 की 5 बैटरी के लिए डील की है। यह पूरी खरीद 40 हजार करोड़ रुपये की है। S-400 एक एयर डिफेंस सिस्टम है, यानी ये हवा के जरिए हो रहे अटैक को रोकता है। ये दुश्मन देशों के मिसाइल, ड्रोन, राकेट लॉन्चर और फाइटर जेट्स के हमले को रोकने में कारगर है। इसे रूस के एलमाज सेंट्रल डिजाइन ब्यूरो ने बनाया है। इसकी गिनती दुनिया के बेहद आधुनिक एयर डिफेंस सिस्टम में होती है। भारत और रूस के बीच S-400 की 5 यूनिट के लिए 2018 में डील हुई थी।

https://zeenews.india.com/hindi/india/india-to-deploy-s-400-in-punjab-to-counter-pakistan-china/1060972

DECCAN Chronicle

Sun, 02 Jan 2022

India needs to gear up for battle in world of drones

Today drones have become an important part of military arsenals across the world

By Manish Tiwari

Remote-controlled soldier boys, deadly killing machines which are armed to the teeth... that create more ill will than they extinguish, through indiscriminate collateral damage", that is how Joe Haldman, the award winning science fiction author of Forever Peace, envisioned what the future weapons and warfare would look like. That was in 1998!

Fast forward 23 years, today the global market of Unmanned Aerial Systems has touched 21.47 billion dollars. US Predator drones have been used to carry out more than 1,100 air strikes. Turkish Byraktar TB2 have destroyed hundreds of Syrian armoured vehicles and the Azerbaijani forces have used the Israeli Kamikaze drones against Armenian military in the Nagarno Karabakh conflict. Haldman's Forever Peace was more a prescient prophecy than just a snazzy a sci-fi novel.

Today drones have become an important part of military arsenals across the world. Conventional war fighting doctrines are singularly ill-equipped to respond to these new age offensive weapons. Their lethality is only going to increase in the future with advances in machine learning, artificial intelligence and precision guidance.

The use of drones to mount localised and virtually autonomous terrorist attacks marks the commencement of a significant new security challenge for India. The attack in the June of 2021, where low-flying drones were used to drop two improvised explosive devices (IED) on the Jammu IAF station, is a clear manifestation of this emerging frontier. The attack was significant not just because it was the first time drones were used to launch an attack on a defence establishment in India, but also because the Indian defence systems were completely caught off guard. Not a very unusual occurrence unfortunately.

A threat to India

The stupefied reaction of the national security establishment after the attack was disconcerting to say the least. It seemed as if they were only now waking up to the portentousness of the drone threat. However, the fact remains that the drone menace in India is not new. There have been over 300 drone sightings since 2019. A bulk of them have been reported from the Kanachak, Satwari, Samba, Hiranagar and Kathua sectors of the International border and Line of Control, respectively.

In June 2020, the BSF shot down a drone carrying a rifle, two magazines and a cache of grenades. There was even a drone hovering above the premises of the Indian High Commission in Islamabad when India had invited diplomats from other countries to commemorate 75 years of its Independence. The Directorate of Revenue Intelligence (DRI) had seized 85-high end Chinese drones busting a ring of drone smuggling worth Rs.10,000 crores in 2019.

Not only government agencies but even strategic analysts and chief ministers of border states have been flagging the possibility of attacks via low-flying sub-conventional aerial platforms including UAVs and their use for the cross border smuggling of arms and ammunitions. These threats do not just come from across the border today even Naxalites, are now reportedly deploying drones in their operations against Indian security forces.

Why drones?

Why are drones now the weapon of choice for terrorists and insurgents? They are inexpensive. They can be easily procured off the shelf or assembled using retail-level components. This rudimentary but lethal assemblage is closely associated with the issue of drone availability. Modern drones, debuting with the expensive Predator drones of the US post the 9/11 attack ,are not easily available. This is because US tightly controls the export of its Predator and Reaper Unmanned Combat Aerial Vehicles (UCAV's). They are only available to close military allies. However, China, Israel and Turkey have started developing their own UCAVs, that they also widely export. It is not difficult for quasi military states like Pakistan, to now develop affordable ways to project force with greater lethality at a much lower risk for non-conventional operations.

India has an Unmanned Aerial Systems (UAS) market pegged at $866 million, this essentially means drones are available in the country in large numbers and can be probably weaponised by anyone, anywhere and anytime.

Drones have low Radar Cross Section (RCS), slow speed and a small size lending to its stealth and concealment advantages in battlefields, and thereafter, making it difficult to identify and localise. Conventional radar systems are not meant for detecting small flying objects, and, even if they are calibrated that way, they might confuse a bird for a drone and the system may get overwhelmed. The small size also grants them weak thermal, and aural signatures. Swarm drones are even harder to track, as miniature drones attacking in wave-after-waves of swarms overwhelm enemy sensors with a deluge of targets — an eerie reminder of the 2012 sci-fi novel Kill Decisions.

While drones can be countered with drones, the technology to counter swarm drones is still a work in progress. Australia's drone shield is an attempt at solving this problem. It disrupts radio frequency in the hostile drone's video feed and forces it to land on the spot or return to the operator.

Then there is the matter of actually disabling such drones. Choosing between "soft" and "hard" kill options is not straightforward. While in some cases a soft kill would be preferable, in other cases like swarm attacks, rapid hard kill will be more appropriate. Whatever method of detection and removal is chosen, the protection required is technological in nature and far more costly than the actual danger. Moreover, differentiating between legitimate and potentially threatening drones will be a massive challenge itself.

India's response

The domestic research and development for anti-drone systems is at a "nascent stage". While the Defence Research and Development Organisation (DRDO) has developed an "Anti Drone System", they have been only used to guard VIPs during national day celebrations. If India needs to take up the challenge it needs to develop fast-track research and development for systems that can be operationally deployed for wider use. Then there is the challenge of the technology's strategic deployment and the money the government is ready to spend.

Additionally, there is the problem of military's unduly focus on major platforms and not enough on future technologies like robotics, artificial intelligence, cyber and electronic warfare to counter 21st century threats.

General M.M. Naravane rightly opined that "...the advent of drones and counter-drone systems, has radically altered the way we think and how we will fight in the future". It is about time that our defence establishment starts to walk the talk.

https://www.deccanchronicle.com/opinion/columnists/010122/manish-tewari-india-needs-to-gear-up-for-battle-in-world-of-drones.html

THEWEEK

Sun, 02 Jan 2022

France to support bid to export next-generation tank to Indian Army

A French lawmaker has called for further production of Nexter's Leclerc tank

In June last year, 12 companies supplying main battle tanks received requests for information (RFIs) from the Indian government. The RFIs related to the supply of about 1,770 new tanks for the Indian Army under a programme dubbed the Future Ready Combat Vehicle (FRCV).

In the works for over a decade, the FRCV envisages the replacement of the Indian Army's fleet of Soviet-era T-72 tanks. The first of the new tanks are intended to enter service by 2030 and will feature advanced networking capabilities to communicate with both land and air forces. The value of the FRCV contract was earlier estimated to be around $5 billion. France's Nexter was one of the companies to receive the RFI, along with firms in Russia, Israel, Europe, Turkey and the US.

A Leclerc MBT | Via Wikimedia Commons

Last week, the French government informed the National Assembly, the country's lower house of Parliament, it would support Nexter's industrial proposal for India. The FRCV project envisions manufacturing of the selected tank in India with a 'strategic partner'.

The French government's response was published on December 28 and came in response to a question from Nicolas Dupont-Aignan, a deputy in the National Assembly. Asking about India's FRCV project, Dupont-Aignan had called for resuming production of Nexter's existing Leclerc tank. The French Army had inducted a total of 406 Leclerc tanks by the mid-2000s. The Leclerc has also been exported to the UAE, which donated dozens of the type to Jordan.

In his question, Dupont-Aignan pointed out that France was modernising only around 200 Leclerc tanks for use until 2040. Dupont-Aignan pointed out that "during the next 20 years nothing is planned to effectively reinforce the heavy land combat means" of the French Army. He argued that Nexter winning the FRCV contract would mean separate production lines for the Leclerc in both France and India that would make "purchase price of this tank particularly competitive, both for the Indian and French armies and for export".

He argued France needed at least 400 tanks. Dupont-Aignan also pointed to the possibility of sharing with India the cost of developing specialised versions of the Leclerc for purposes such as command vehicle, artillery platform and anti-aircraft defence.

In its response to Dupont-Aignan, the French government said it would ensure attention to synergies "that may exist between the needs of the Indian armies and our national needs".

The Leclerc

In his question, Dupont-Aignan noted, "The Leclerc tank with its mass of only 55 tons, its good mobility with its 1,500 hp engine and the excellence of its turret and firing system, is very well placed" to win the FRCV contract.

The Leclerc is lighter than most major Western tanks such as the US M1 Abrams, British Challenger and German Leopard 2, all of which weigh over 60 tonnes.

The Leclerc also has a three-man crew, unlike the other three Western designs, with the 'loader' absent. In place of the loader, a soldier who manually inserts rounds into the gun, the Leclerc has an 'autoloader' device for the purpose; Russian tanks such as the T-72 and T-90 also have auto-loaders. The Leclerc also has an advanced communications system to network with ground and air units.

The Leclerc tanks of the French Army are currently being upgraded to the Leclerc XLR standard, which would feature a modular armour package, new combat information system, radios, jammers and remotely operated machine gun.

Nexter is working on a futuristic tank project with Germany's Krauss Maffei Wegmann for a common tank to replace the Leclerc and Leopard 2, but the vehicles are unlikely to enter mass production by 2040. The French government's response in the National Assembly did not specify what kind of tank Nexter would offer to India.

https://www.theweek.in/news/india/2022/01/02/france-to-support-bid-to-export-next-generation-tank-to-indian-army.html

THE HINDU

Mon, 03 Jan 2022

‘Malabar is the most complex naval exercise’

More and more countries want to exercise with us, says defence official

By Dinakar peri

New Delhi: While the Navy gears up to hold its largest multilateral exercise ‘Milan’ end February, there are requests from several countries for various formats of exercises, defence officials said, pointing out that Malabar is the most complex naval exercise India does with any other country.

Meanwhile, China continues to expand its presence and assistance in the region, the latest being the delivery of Ming class diesel-electric submarine to Myanmar, its second submarine after the first one given by India.

“The tempo of exercises has been very high last few years and more and more countries want to exercise with us,” one defence official said. This could see some consolidation with expansion of existing bilateral or trilateral exercises into larger formats which could bring down the overall number while increasing the engagements, the official stated.

Aircraft carriers and warships participate in the second phase of Malabar naval exercise, a joint exercise comprising of India, US, Japan and Australia, in the Northern Arabian Sea on Tuesday, Nov. 17, 2020. The four countries form the Quadrilateral Security Dialogue, or the Quad. (Indian Navy via AP)

Logistics agreements

These engagements are further amplified by the bilateral logistics agreements, Navy to Navy agreements and information sharing agreements that India has concluded with several countries. Some countries require a Navy to Navy agreement for their bureaucratic process, the official explained.

India also exchanges maritime Information bilaterally with Friendly Foreign Countries to create Maritime Domain Awareness (MDA) in the Indian Ocean Region (IOR), the government said recently in Parliament.

In a rare acknowledgement, Minister of State for Defence Ajay Bhatt, in a written reply in the Rajya Sabha in November, said, “This includes information on military and naval assets of hostile/adversarial countries; assessment of maritime activities of mutual concern and activities related to transnational maritime based threats.”

These developments have gained pace in the backdrop of rapid expansion of the Chinese Navy and its presence in the IOR. There has been a significant increase in exercises as well as operational interactions with regional navies.

Malabar, which began as a bilateral exercise between India and the U.S. in 1992 and became multilateral with the addition of Australia and Japan, has also significantly grown in scope and complexity. Twenty-five editions of the exercise have been conducted till date with the last edition conducted in two phases in August and October 2021.

Information exchange

Maritime Domain Awareness (MDA) has emerged as an important theme for regional cooperation in recent years and the Navy's Information Fusion Centre for Indian Ocean Region (IFC-IOR) positioned itself as an important hub for it. International Liaison Officers from 14 countries have been invited to join the centre, of which nine ILOs have joined and at least three more are expected to join very soon, including from Bangladesh, Seychelles and Sri Lanka, another official stated.

India has also signed white shipping exchange agreements with 22 countries and one Multi-national Construct.

Chinese presence

India has also taken up capacity building in a big way to assist littoral states in augmenting their armed forces. This comes in the backdrop of China's efforts in this direction in the region.

The old Type 035B Ming class submarine from China was inducted into the Myanmar Navy on December 24, just a day after the visit of Foreign Secretary Harsh Shringla's visit to the country. In October 2020, India has transferred *INS Sindhuvir*, a Russian origin Kilo class submarine, from its naval fleet to Myanmar, renamed UMS Min Ye Thein Kha, its first submarine.

In 2016, Bangladesh has procured two Ming class submarines from China. It has also announced plans for the supply of its new Yuan class conventional submarines equipped with air independent propulsion as well as Type-054A stealth frigates among other equipment to Pakistan.

https://www.thehindu.com/news/national/malabar-is-the-most-complex-naval-exercise/article38093935.ece

ScienceDaily

Mon, 27 Dec 2021

'Nano-chocolates' that store hydrogen

Innovative ideas for the energy carrier of the future

Summary:

An innovative approach could turn nanoparticles into simple storage devices for hydrogen. The concept uses nanoparticles made of the precious metal palladium.

An innovative approach could turn nanoparticles into simple reservoirs for storing hydrogen. The highly volatile gas is considered a promising energy carrier for the future, which could provide climate-friendly fuels for airplanes, ships and lorries, for example, as well as allowing climate-friendly steel and cement production -- depending on how the hydrogen gas is generated. However, storing hydrogen is costly: either the gas has to be kept in pressurised tanks, at up to 700 bar, or it must be liquified, which means cooling it down to minus 253 degrees Celsius. Both procedures consume additional energy.

A team led by DESY's Andreas Stierle has laid the foundations for an alternative method: storing hydrogen in tiny nanoparticles made of the precious metal palladium, just 1.2 nanometres in diameter. The fact that palladium can absorb hydrogen like a sponge has been known for some time. "However, until now getting the hydrogen out of the material again has posed a problem," Stierle explains. "That's why we are trying palladium particles that are only about one nanometre across." A nanometre is a millionth of a millimetre.

To ensure that the tiny particles are sufficiently sturdy, they are stabilised by a core made of the rare precious metal iridium. In addition, they are attached to a graphene support, an extremely thin layer of carbon. "We are able to attach the palladium particles to the graphene at intervals of just two and a half nanometres," reports Stierle, who is the head of the DESY NanoLab. "This results in a regular, periodic structure." The team, which also includes researchers from the Universities of Cologne and Hamburg, published its findings in the American Chemical Society (ACS) journal *ACS Nano*.

DESY's X-ray source PETRA III was used to observe what happens when the palladium particles come into contact with hydrogen: essentially, the hydrogen sticks to the nanoparticles' surfaces, with hardly any of it penetrating inside. The nanoparticles can be pictured as resembling chocolates: an iridium nut at the centre, enveloped in a layer of palladium, rather than marzipan, and chocolate-coated on the outside by the hydrogen. All it takes to recover the stored hydrogen is for a small amount of heat to be added; the hydrogen is rapidly released from the surface of the particles, because the gas molecules don't have to push their way out from inside the cluster.

"Next, we want to find out what storage densities can be achieved using this new method," says Stierle. However, some challenges still need to be overcome before proceeding to practical applications. For example, other forms of carbon structures might be a more suitable carrier than graphene -- the experts are considering using carbon sponges, containing tiny pores. Substantial amounts of the palladium nanoparticles should fit inside these.

Journal Reference:

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