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Mon, 10 Jan 2022

IAC Vikrant sails for its third sea trials

The warship will undertake complex manoeuvres to establish specific readings of how it performs under various conditions

Kochi: The Indigenous Aircraft Carrier (IAC) Vikrant headed out for its third set of sea trials on Sunday lasting about two weeks to undertake complex manoeuvres to establish specific readings of how the warship performs under various conditions.

Scientists from the Naval Science and Technological Laboratory, a DRDO laboratory based in Visakhapatnam, would also be embarked during the trials. In addition, various sensor suites of the ship would also be tested, an official release said here.



The Indigenous Aircraft Carrier Vikrant that headed out for its third set of sea trials on Sunday, Jan 9, 2022. (Photo | Express)

The maiden sea trials in August last year saw the IAC establish propulsion, navigational suite, and basic operations and the second sea trial later in October-November witnessed the ship being put through its paces in terms of various machinery trials and flight trials.

The ship was out for 10 days proving its sustenance in the second sortie. In its latest sea trials, the warship would operate a mix of MiG-29K fighter aircraft and various helicopters, ranging from the Kamov 31 Air Early Warning helicopters, the soon-to-be-inducted MH-60R multi-role helicopters, and the indigenously developed Advanced Light Helicopter Mk III.

The third trials come after both President Ram Nath Kovind and Vice-President M Venkaiah Naidu, who reviewed the progress of the IAC during their recent visits to the Southern Naval Command headquarters in Kochi, conveyed their satisfaction and expressed their best wishes to all the stakeholders involved in the project. In its second sortie, various seamanship evolutions were successfully cleared.

The IAC has been a success story on numerous counts. Be it the case of Atmanirbharta wherein 76% of the equipment is indigenously sourced or the close engagement between the design teams of the Indian Navy and Cochin Shipyard Limited – a high-point in the largest and most complex warship ever to be built in the country. “That the ship has been able to carry out basic flying operations from its very first sortie itself is a landmark in Indian warship construction history,” the release said.

More trials

- The third trials come after both President Ram Nath Kovind and Vice-President M Venkaiah Naidu reviewed the progress of the IAC during their recent visits to the Southern Naval Command headquarters in Kochi
- After the successful completion of a series of progressive sea trials, the ship is scheduled to be commissioned as INS Vikrant later this year, as the nation commemorates ‘Azadi Ka Amrit Mahotsav’.

<https://www.newindianexpress.com/states/kerala/2022/jan/10/iac-vikrant-sails-for-its-third-sea-trials-2404969.html>

Indigenous Aircraft Carrier Vikrant heads out for next round of sea trials

Indigenous Aircraft Carrier Vikrant now sails to undertake complex manoeuvres to establish specific readings of how the ship performs in various conditions

Kochi: The Indigenous Aircraft Carrier (IAC) Vikrant has headed out for the next set of sea trials on January 9, shortly after two high-profile visits — that of the President and the Vice-President of India within a span of about two weeks.

The maiden sea trials in August 2021 were to establish propulsion, navigational suite and basic operations, while the second sea trial in October-November saw the ship being put through various machinery trials and flight trials. Here, the ship was out for 10 days, proving its sustenance in the very second sortie. Various seamanship evolutions were also successfully cleared during the second sortie.

The IAC now sails to undertake complex manoeuvres to establish specific readings of how the ship performs in various conditions. Various sensor suites of the ship too would be tested. Scientists from the Naval Science and Technological Laboratory — a DRDO laboratory based at Visakhapatnam would embark the vessel during the trials, the Navy has said.

That the ship was able to carry out basic flying operations from its very first sortie itself is a landmark in Indian warship construction history. Despite surging COVID cases in the country and the resultant challenges, the combined teams from multiple organisations associated with the project, are upbeat and committed to meet the timelines.

On successful completion of a series of progressive sea trials, the ship is scheduled to be commissioned as *INS Vikrant* later this year, as the nation commemorates 'Azadi ka Amrit Mahotsav'.

The ship would operate a mix of MiG-29K fighter aircraft and various helicopters, ranging from the Kamov-31 Air Early Warning helicopters, the soon-to-be inducted MH-60R multi-role helicopters and the indigenously developed Advanced Light Helicopter Mk III, the Navy said.

<https://www.thehindu.com/news/national/indigenous-aircraft-carrier-vikrant-heads-out-for-next-round-of-sea-trials/article38203234.ece>



Indigenous Aircraft Carrier Vikrant heads out for sea trials from Kochi on January 9, 2022. Photo: Special Arrangement

Rafale fighter to join carrier Vikrant for compatibility trials

Boeing also to demonstrate fit of its F/A-18 Super Hornet fighter

By Dinakar Peri

New Delhi: As the 40,000-tonne, indigenous aircraft carrier *Vikrant* sailed out from Kochi harbour on Sunday for the third phase of sea trials, beginning Monday, French aircraft maker Dassault Aviation will fly its Rafale-M fighter jet from the Indian Navy's Shore Based Test

Facility (SBTF) in Goa to demonstrate compatibility and suitability to operate from the carrier's deck.

The Rafale-M arrived in Goa last Thursday and the demonstration is expected to go upto February 1, two Defence officials independently said. Boeing will also demonstrate the compatibility of its F/A-18 Super Hornet on the SBTF likely in March, it has been learnt.

These trials are part of demonstrations by aircraft manufacturers to showcase the compatibility of their aircraft to fly from Indian Navy's aircraft carriers which use a ski-jump to launch aircraft, one official explained.

Both the Rafale-M and F/A-18 are originally designed to operate from carriers with a catapult launch mechanism. The carrier would thus require minor modifications to operate the aircraft, officials said.

A government-to-government agreement could be signed based on the aircraft selected to speed up the process, one of the official observed.

Boeing has taken a lead in the race having already demonstrated the ability of F/A-18 to take off from a similar shore based facility at Naval Air Station Patuxent river in Maryland, U.S. in December 2020.

However, each fighter brings certain advantages while having some limitations. For instance, while the Rafale-M is not a twin-seater, its acquisition would mean commonality with the Indian Air Force which will soon complete inducting the 36 Rafale jets contracted in 2016. On the other hand, the F/A-18 is a more widely employed platform with a twin-seater trainer and also has an electronic warfare version which might be of interest to the Navy. There is also the issue of the size of the aircraft and their fit on the carrier and its lifts, which would also be factored in the final evaluation.

Urgent requirement

In 2017, the Navy had floated Request For Information (RFI) to procure 57 twin-engine carrier fighters which is now set to downsized to around 26, including few twin-seater trainer variants. The revision is in the backdrop of a new indigenous Twin Engine Carrier Based Deck Fighter (TEBDF) being designed and developed by the Defence Research and Development Organisation (DRDO) and Aeronautical Development Agency (ADA).

However, the procurement has now gained urgency as the Navy is short of aircraft to operate from both the carriers. The *Vikrant* is scheduled to be commissioned this August coinciding with 75 years of Independence, while the aviation trials and operationalisation will go into 2023.

INS Vikramaditya, the only carrier in service presently, operates the Mi9-29K aircraft. While 45 aircraft were originally contracted from Russia, their availability has been a major problem and won't fill the requirements of both the carriers, Navy officials stated.

According to ADA, the first flight of the under-development, TEBDF is planned in 2026. It is envisaged as a twin-engine medium weight fighter, with an all up weight of 26 tonnes and wing folding and is meant to replace the Mig-29Ks in service, as reported by *The Hindu* earlier.

Phase-3 sea trials

The *Vikrant* had sailed out for maiden trails in August 2021 and Phase-2 trials in October of that year. According to the Navy, in the current phase of sea trials, the carrier will "undertake complex manoeuvres to establish specific readings of how the ship performs in various conditions."

Scientists from the Naval Science and Technological Laboratory, a DRDO laboratory based at Visakhapatnam would also be on board during the trials, the Navy said. "In addition, various sensor suites of the ship would also be tested."

<https://www.thehindu.com/news/national/indias-first-indigenous-aircraft-carrier-begins-another-phase-of-sea-trials/article38203075.ece>

‘Light Combat Aircraft MK-1A to take flight in June’

A larger aircraft LCA MK-2 to roll out by year end or early 2023, says HAL MD

By Dinakar Peri

New Delhi: Hindustan Aeronautics Limited (HAL) expects to deliver all Light Combat Aircraft (LCA) Tejas in the Final Operational Clearance (FOC) variant to the Indian Air Force (IAF) in 2022 while the LCA MK-1A, with specific enhancements, will take flight by middle of this year, said R. Madhavan, Chief Managing Director, HAL.

“We will be attempting at least 6-8 aircraft (LCA) this year. All 10 aircraft are already ready, there are some systems to be delivered from Israel. If that happens in time, we can deliver all 10,” Mr. Madhavan told *The Hindu* talking of the hectic calendar HAL has for this year. “By June this year we should start flying the LCA MK-1A configuration. Once flying starts, we have about 20 to 24 months of testing. Once that is done, we will be ready for deliveries as expected.”



Taking flight: HAL will try to deliver all 10 Light Combat Aircraft (LCA) Tejas aircraft by this year. File | Photo Credit: The Hindu

Last February the Defence Ministry had signed a Rs.48,000 crore deal with HAL to supply 83 LCA MK-1A to the IAF. HAL will be delivering the first three aircraft in 2024 and 16 aircraft per year for subsequent five years, the Defence Ministry had stated earlier.

We will start manufacturing activities parallel with the testing, Mr. Madhavan said on LCA MK-1A schedule. With COVID-19 cases surging again, there could be some delay if the work schedule is disrupted.

To ramp up production, HAL has already set up two additional assembly lines. Stating that all three LCA assembly lines are operational now, Mr. Madhavan said the back end of the lines is what they are finishing now including supply of sub-assemblies by vendors.

LCA-MK2 roll out by year end or early 2023

The design for LCA MK-2, a much bigger aircraft, has been frozen and some of the manufacturing activities have started. Hopefully by this year end or early 2023 we should have the first roll out of the aircraft, and one year after that it will be taking to the skies, Mr. Madhavan said. “We are targeting early 2023 but we should be able to do it slightly early.”

The LCA MK-2 features enhanced range and endurance including Onboard Oxygen Generation System (OBOGS), which is being integrated for the first time. Heavy stand off weapons of the class of Scalp, Crystal Maze and Spice-2000 will also be integrated on the MK-2. The MK-2 will be a heavier and much more capable aircraft than the current LCA variants with the aircraft 1350mm longer, featuring canards and can carry a payload of 6,500 kg compared to 3,500 kg by the LCA.

IAF had earlier placed orders for 20 IOC (Initial Operational Configuration) standard aircraft and 20 FOC standard aircraft including eight twin seater trainers. The First LCA squadron with IOC aircraft is complete and the second squadron with FOC has also been operationalised. Once the FOC aircraft are delivered, the twin seater aircraft would be the balance from this order.

The HAL is also expecting the formal contract from the Services for the Light Combat Helicopter (LCH) which was formally handed over to the IAF by Prime Minister Narendra Modi at an event in Jhansi in November.

The manufacture of the Light Utility Helicopter (LUH), which has received the Initial Operational Clearance, is also in advanced stages with HAL’s new facility in Tumkur set to be

ready by March. The government recently informed in Parliament that four Limited Series Production (LSP) LUH would be manufactured by 2022-23 and eight LSP LUHs by 2023-24.

<https://www.thehindu.com/news/national/light-combat-aircraft-mk-1a-to-take-flight-in-june/article38200517.ece>

The BrahMos sale to Philippines; Implications and prospects

The forthcoming sale of the BrahMos is a logical next step for the Philippines and at the same time a logical step for India.

By Dr Pooja Bhatt and Dr Aparajita Pandey

The Philippines is set to acquire two batteries of shore based, anti-ship BrahMos Missile as a government-to- government deal. This is to be noted that India had offered a line of credit of \$100 million for defence purchases. However, according to the reports, the Department of Budget Management (DBM) issued two special allotment release orders (SARO) costing P1.3 billion and P1.535 billion for the Philippine Navy's on December 27. With this deal, India is moving towards being a reliable regional security partner in addition to its increasing proactive partnerships in the regional security organisations such as ASEAN, SCO and so on. New Delhi is seeking an increase in defence exports as a part of strengthening its defence manufacturing and production. An additional SARO of 31 million USD has also been sanctioned to cover the initial payment towards the purchase of combat utility helicopters for the Philippines Navy.

This is not the first time that a country in the ASEAN region has shown an interest in the BrahMos. Previously Vietnam, Indonesia, and Thailand have also shown an interest in the BrahMos. The negotiations that had initially stalled due to the economic crisis in the Philippines brought on by the spread of Covid – 19 has now once again started to move towards fruition. The mention of the possibility of BrahMos negotiations between



India and Philippines had predictably raised some initial concerns about CAATSA; however, the Indian steadfastness on the complete control over its sovereign decisions has negated such suspicions.

Previously Vietnam, Indonesia, and Thailand have also shown an interest in the BrahMos. (Representative image)

As Philippines gears up to be the first country to acquire the BrahMos it can not be ignored that this acquisition will have an impact on the strategic dynamics of not just between the ASEAN nation and China, but also between India and China. The two maritime zones of the South China Sea and the Indian Ocean Region; both stand to feel the reverberations of this deal.

Philippines is the only Non – NATO ally of the US and their relationship has seen its fair share of peaks and valleys; it's important to notice that given the current situation of the region vis – a vis China, it is mutually beneficial for the US and Philippines to maintain a cordial relationship with regards to security and defence cooperation.

As the Philippines has attempted to build its military arsenal and build capacity, the island nation has also agreed to the purchase of 15 Black Hawk Helicopters in February 2021. It is quite

clear that the Philippines is beginning to equip itself against the constant and the predominant presence of China in the region.

The forthcoming sale of the BrahMos is a logical next step for the Philippines and at the same time a logical step for India. To begin with, the sale fulfills a purely economic interest for India. The sale of BrahMos to the Philippines does not just signify the immediate economic gain, it also is a part of the greater Indian strategy to expand its defence trade sector. At present India is the 24th largest exporter of major arms in the world and between 2016 to 2020, the Indian sales accounted for .02 per cent of the total arms sales in the world. India has a vision of expanding its defense manufacturing sector and also becoming a bigger arms exporter generating a revenue of 5 billion USD by 2025. Moreover, as India became a member of the Missile Technology Control Regime, it widened India's own arms sales portfolio.

There is quite an obvious strategic angle to this deal. While for the Philippines it is important to be equipped to defend itself in the region, India also stands to gain from countries with greater defense capabilities against China for a more even keel. The Philippines is aiming at domestic defense modernization and has been purchasing new weapons and defence platforms from several countries including South Korea; the BrahMos will play a crucial role in its coastal security upgradation especially against the external threat from China. While it is naïve to believe that the Philippines can match the Chinese military and/or naval prowess it is important to note that there are greater emblematic connotations to this deal.

While the militarization of the region has become an inevitable reality the sale of the BrahMos missiles seems like an organic next phase. While China has flaunted its superior combat capabilities for decades, the Philippines might just set the proverbial ball rolling for other countries of the region to work towards a better security portfolio. Both economic and strategic opportunities for India are clear. More allies in the region and greater check on the Chinese expansion could be some of the long-term effects of such a trade deal.

<https://www.financialexpress.com/defence/the-brahmos-sale-to-philippines-implications-and-prospects/2400954/>



Sat, 08 Jan 2022

बुलेट प्रूफ जैकेट भी इसके आगे फेल, ये कारबाइन आतंकियों के लिए है काल

ज्वाइंट वेंचर प्रोटेक्टिव कारबाइन शॉर्ट रेंज ऑपरेशंस के लिए एक अनोखा कैलिबर हथियार है। इसकी कम पुनरावृत्ति तेजी से गोलाबारी के दौरान स्थिर गोलीबारी प्रदान करती है। इसे एक हाथ से भी निकाला जा सकता है। इसमें कॉकिंग हैंडल के लिए उभयलिङ्गी विशेषताएं हैं। इसके अतिरिक्त संतुलित फायरिंग के लिए वापस लेने योग्य बट है, जो छुपा क्षेत्र के संचालन के लिए सबसे कारगर है।

लखनऊ: रक्षा के क्षेत्र भारत की बढ़ती आत्मनिर्भरता का एक छोटा से नमूना है संयुक्त उद्यम उत्पादन कारबाइन (ज्वाइंट वेंचर प्रोडक्शन कारबाइन)। इस आधुनिक हथियार की डिजाइन को डीआरडीओ (DRDO) के आयुध अनुसंधान एवं विकास प्रतिष्ठान ने तैयार की है। जिसका निर्माण कानपुर की स्माल आर्म्स फैक्ट्री (लघु शस्त्र निर्माणी) में किया जा रहा है। जेवीपीसी एक ऐसी कारबाइन है जो हर मिनट में 800 गोलियां दुश्मनों पर बरसाएंगी। जेवीपीसी (JVPC) की पहली खेप में 105 कारबाइन कानपुर की स्माल आर्म्स फैक्ट्री से सीतापुर स्थित यूपी पुलिस के आयुध भंडार भेजी जा चुकी है। इसके अलावा जम्मू-कश्मीर में आतंकियों को करारा जवाब देने के लिए जेवीपीसी बहुत ही कारगर हथियार साबित होगा।

पैरामिलिट्री फोर्स ने भी दिखाई जेवीपीसी (JVPC) में रुचि

बता दें कि जेवीपीसी (JVPC) को लेकर दिल्ली पुलिस और केंद्रीय औद्योगिक सुरक्षा बल के साथ ही पैरामिलिट्री फोर्स ने भी इसमें रुचि दिखायी थी। कानपुर की लघु शस्त्र निर्माणी ने करीब 4500 जेवीपीसी की खेप कई चरणों में पूरी कर दी है। जबकि अभी भी करीब पांच हजार जेवीपीसी का निर्माण युद्धस्तर पर जारी है। जेवीपीसी की खासियत को देखकर माना जा रहा है कि जल्द ही सेना के हथियारों में इसको शामिल किया जा सकता है।

कानपुर की स्माल आर्म्स फैक्ट्री हो रहा है निर्माण

जानकारी के अनुसार कानपुर की स्माल आर्म्स फैक्ट्री की क्षमता हर साल दस हजार जेवीपीसी बनाने की है। जिसे आवश्यकता के अनुसार और भी बढ़ाया जा सकता है।

मार्च 2022 तक 5 हजार JVPC बनाने का है टॉरगेट

दिल्ली पुलिस, जम्मू पुलिस के साथ संसद, दिल्ली मेट्रो की सुरक्षा में लगी सीआइएसएफ से करीब दस हजार जेवीपीसी का आर्डर मिला था। इसमें पांच हजार तैयार कर ली गई हैं। माना जा रहा है कि मार्च 2022 तक नए आर्डर मिल सकते हैं। जिसके चलते अगले दो माह में पूर्व में मिले आर्डर तेजी से पूरा किया जा रहा है।



ज्वाइंट वेंचर प्रोडक्शन कारबाइन की विशेषताएं

लघु शस्त्र निर्माणी (SAF) और एआरडीई (ARDE) पुणे के संयुक्त प्रयास से ज्वाइंट वेंचर प्रोटेक्टिव कारबाइन को विकसित किया गया है। जेवीपीसी देश में विकसित कारबाइन है। पहले जो विदेश से कारबाइन खरीदी जाती थी, वे काफी महंगी पड़ती थीं। जेवीपीसी काफी हल्की कारबाइन है और बिना मैगजीन के इसका वजन सिर्फ तीन किलोग्राम है।

स्टील को भेदने में भी है सक्षम

यह कारबाइन बुलेट प्रूफ लक्ष्य और स्टील को भी भेदने में सक्षम है। इसे 200 मीटर दूर खड़े दुश्मन पर भी अचूक निशाना साधा जा सकता है। इसके अलावा जेवीपीसी का फायरिंग मोड मैनुअल व ऑटोमैटिक है। इसमें एक बार में 30 कारतूसों की मैगजीन लोड होती हैं।

एक मिनट में बरसेगी 800 गोलियां

वहीं, स्प्रिंग मैकेनिज्म सिस्टम के चलते कारतूसों की बेल्ट से एक मिनट में 800 गोलियां फायर होती हैं। जेवीपीसी एक बार में सबसे अधिक फायर करने वाली कारबाइन है। इसकी सबसे खास बात यह है कि गैस ऑपरेटेड होने से फायरिंग के बाद बैरल काला नहीं पड़ता है और नाइट विजन कैमरे से लैस होने के कारण रात में भी सटीक निशाना लगाने में सक्षम है।

सुरक्षाबलों की पहली पसंद बनी जेवीपीसी

ज्वाइंट वेंचर प्रोडक्शन कारबाइन केंद्रीय सुरक्षा बलों की पहली पसंद बन चुकी है। सीआरपीएफ, आईटीबीपी, सीआईएसएफ और बीएसएफ अब अपने जवानों को नई जेवीपीसी से लैस कर रहा है। इसके अलावा नक्सल प्रभावित छत्तीसगढ़ पुलिस को भी यही कारबाइन दी जा रही है। वहीं उत्तर प्रदेश में आतंकियों के बढ़ते खतरे के को देखते हुए प्रदेश की पुलिस की आरमरी में जेवीपीसी को जल्द ही शामिल किया जाएगा।

<https://www.patrika.com/lucknow-news/jvpc-carbine-fires-800-bullets-in-a-minute-7262946/>

गुरुकुल को मिला डीआरडीओ से 33 लाख का प्रोजेक्ट

हरिद्वार: गुरुकुल कांगड़ी विश्वविद्यालय में अभियांत्रिकी एवं प्रौद्योगिकी संकाय के इलेक्ट्रॉनिक्स एवं कम्युनिकेशन विभाग को रक्षा अनुसंधान एवं विकास संगठन की तरफ से 33 लाख का रिसर्च मेजर प्रोजेक्ट मिला है। इस प्रोजेक्ट का संचालन इलेक्ट्रॉनिक्स एवं कम्युनिकेशन विभाग के वैज्ञानिक डॉ. तनुज कुमार गर्ग करेंगे। प्रोजेक्ट शीर्षक बीम स्केनिंग रेट इन्हांसमेंट इन लेकी वेव एंटीना पर शोध कार्य करेंगे। रडार के लिए बीम स्केनिंग एंटीना पर होगा रिसर्च कार्य होगा।

कुलपति प्रो. रूपकिशोर शास्त्री ने कहा कि विश्वविद्यालय के युवा वैज्ञानिक डॉ. तनुज कुमार बीम स्केनिंग के क्षेत्र में काम करेंगे। एंटीना बनाने के लिए नई-नई तकनीकों का प्रयोग करेंगे। कुलसचिव डॉ. सुनील कुमार ने कहा कि डीआरडीओ से प्रोजेक्ट मिलना विश्वविद्यालय के लिए गौरव की बात है। अभियांत्रिकी एवं प्रौद्योगिकी संकाय के संकायाध्यक्ष प्रो. पंकज मदान ने कहा कि संकाय में पहली बार मेजर प्रोजेक्ट मिला है। प्रोजेक्ट पर तीन साल के लिए काम किया जाएगा। डॉ. विपुल कुमार शर्मा ने कहा कि डॉ. तनुज कुमार गर्ग आकाश में फैली हुई तरंगों और सेना के लिए एंटीना को लेकर भी काम करेंगे। युवा वैज्ञानिक डॉ. तनुज कुमार गर्ग ने बताया कि इस परियोजना में बीम स्केनिंग पर विशेष काम किया जाएगा। बीम स्केनिंग का अर्थ होता है आकाश में फैली हुई तरंगों के बारे में जानकारी इकट्ठा करना, उन तरंगों की स्केनिंग कर डाटा का संकलन करना। यह परियोजना भारत सरकार के रक्षा मंत्रालय द्वारा प्रदत्त है।

<https://www.livehindustan.com/uttarakhand/haridwar/story-gurukul-got-33-lakh-project-from-drdo-5515380.html>

Div Com reviews functioning of DRDO Hospital

Jammu: In view of the recent surge in covid -19 cases and to review the preparedness of dedicated COVID hospitals, Divisional Commissioner Jammu, Dr Raghav Langer today visited DRDO hospital Bhagwati Nagar and reviewed its functioning at a meeting with the concerned officers.

The Divisional Commissioner held a detailed review of the facilities, issues pertaining to medical oxygen, status of water, power supply, status of roads, staff strength etc.

The Medical Superintendent DRDO Hospital apprised the Divisional Commissioner that the hospital has all requisite staff, laboratories, wards and is fully prepared to fight any fresh covid wave.

The Div Com directed the District administration Jammu to establish isolation facilities for travellers. He directed ADC Jammu to visit Yatri Niwas and ensure that all requisite facilities are available for the attendants.

While reviewing water power supply to the hospital, it was informed that dedicated lines have been provided to the hospital for uninterrupted water and power supply.

Regarding the medical oxygen related issues, it was informed that the 500-bedded hospital has oxygen supported beds in both ICU and other wards. The Div Com directed for recheck of the oxygen flow of all the beds.

The chief Engineer MED informed that LMOs are fully functional and the work for suction line & AVR (Automatic Voltage Regulator) has been allotted. The Div Com directed the Mechanical Engineering Department and hospital administration to ensure that both works get completed before January 31, 2022.

The hospital is fully equipped with ventilators, monitors, in-house pharmacy, diagnostic facility, X-Ray and a CT Scan machine has recently been commissioned.

It was further informed that the hospital has sufficient staff strength and 47 doctors have been deployed in the DRDO after a spike in cases.

The Div Com instructed the hospital authorities to project requisitions, if anything is required and be fully prepared to deal with the emerging situation.

Officials of DRDO, Medical Superintendent and Executive Engineer MED were also directed to do a test run with full load ie all 125 ventilators functioning simultaneously to check for any pressure drop.

The meeting was attended by Director Health, Administrative officer GMC, Commandant SDRF, ADC Jammu, Chief Engineer, MED; SP North, Medical Superintendent DRDO, technical staff of DRDO besides senior officers of Jal Shakti, JPDC, PWD and other concerned officers.

<https://www.dailyexcelsior.com/div-com-reviews-functioning-of-drdo-hospital/>

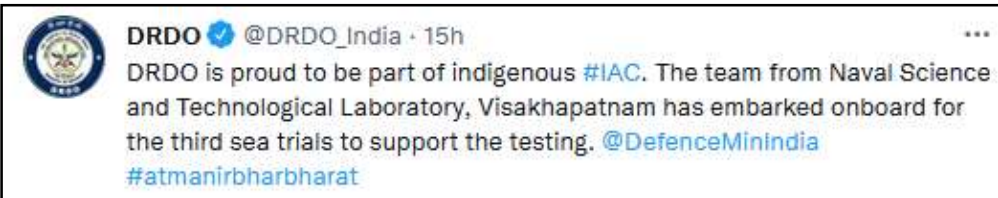


Divisional Commissioner chairing a meeting on Friday.

DRDO on Twitter



9 January 2022



9 January 2022



Press Information Bureau
Government of India

Ministry of Defence

Sat, 08 Jan 2022 1:18PM

Raksha Mantri Shri Rajnath Singh says, 100 new Sainik schools to provide more opportunities for girls to join the Armed Forces

Suggests ranking of Sainik Schools to promote quality & innovation in education

Private sector can bring a revolution of 'Aatmanirbharta' in education sector & holistic development of children: RM

“The setting up of 100 new Sainik schools will provide an opportunity to girls to join the Armed Forces and contribute to national security,” said Raksha Mantri Shri Rajnath Singh while chairing a webinar on Sainik Schools on January 08, 2022. Shri Rajnath Singh said, the Government believes in increasing the role of women in the Armed Forces and a series of steps have been taken in that direction, including clearing the way for admission of girls in Sainik Schools and providing Permanent Commission to women officers. He exuded confidence the decision to establish new Sainik schools will encourage girls to realise their dreams of serving the country.

The Raksha Mantri described the announcement of expansion of Sainik Schools as one of the many important decisions taken by the government in the last six-seven years to improve the quality of basic education of children and ensure holistic development of the country. He hoped that the amalgamation of *Raksha* and *Shikshain* Sainik schools will play an important role in nation-building in the times to come. He stated that while ‘Sainik’ signifies unity, discipline & devotion, ‘School’ is the centre of education, therefore, Sainik schools are playing a pivotal role in making children capable citizens.

Shri Rajnath Singh added that the Government is focussing on providing quality education to the youth of the country as it lays a solid foundation for the all-round development of society. “Quality education is the fourth of the 17 Sustainable Development Goals adopted by the United Nations. There are several other goals under ‘quality education’. It has been our strong political commitment to achieve these goals. Several schemes like Sarva Shiksha Abhiyan and Rashtriya Madhyamik Shiksha Abhiyan are being run. Setting up of 100 new Sainik Schools is another important step in that direction,” he said.

The Raksha Mantri lauded the Sainik School Society for implementing the ideals of visionaries such as Swami Vivekananda, Mahatma Gandhi, Dr BR Ambedkar and Sarvepalli Radhakrishnan who had emphasised on physical, mental, moral and spiritual development of children along with academic education. He appreciated the fact that Sainik schools have contributed to the recruitment of more than 7,000 officers in the Armed Forces so far and have given the country officers like former Chiefs of the Army Staff General Deepak Kapoor (Retd) & General Dalbir Singh Suhag

(Retd), besides Nagaland Chief Minister Shri Neiphiu Rio; former RBI Governor D Subbarao and Film Director Rakesh Roshan.

Shri Rajnath Singh termed education as a key sector which plays a part in the development of all other areas, exhorting the private sector to join hands with the Government to achieve 'Aatmanirbharta' in the field and ensure holistic development of children. "Today, our country is moving fast in the path of self-reliance in every field. It is touching newer heights in fields like defence, health, communication, industry and transport due to the synergy between public and private sectors. There is a need for a revolution in the education sector and holistic development of children. This is only possible if there is a strong collaboration of defence, education and private sector. This webinar is a foundation stone of this partnership," he said, urging the private sector to join the Government's initiative of expansion of Sainik schools.

The Raksha Mantri reiterated that Government's resolve to provide opportunities to the youth of the country. National Education Policy-2020; increase in the vacancies in National Cadet Corps; Khelo India, Start-up India and Fit India campaigns are some of the initiatives of Prime Minister Shri Narendra Modi through which the young & ignited minds of the country can realise their dreams; ensure overall development and take the country to newer heights, he said, adding that the setting up of new Sainik Schools will prove to be an important milestone in this direction.

Shri Rajnath Singh suggested Department of Defence and Sainik School Society to devise a mechanism for ranking all Sainik schools on the basis of their performance and audit. This, he said, will lead to a healthy competition among the schools, besides providing encouragement to try different innovations. He said, along with the curriculum, children should be exposed to patriotism and loyalty towards the Nation as it will help in building their character and benefit the country.

It may be recalled that the Union Cabinet, chaired by Prime Minister Shri Narendra Modi in its meeting on October 12, 2021, had approved the proposal for launching of Sainik Schools in partnership with NGOs/Private Schools/State-owned schools on affiliation basis with Sainik Schools Society. These schools would function as an exclusive vertical, which will be distinct and different from existing Sainik Schools. In the first phase, 100 affiliate partners were proposed to be drawn from States/NGOs/Private partners.

The webinar was organised to have stakeholder consultations to evolve a sound Qualifying Requirement (QR), Affiliation bye-laws, Memorandum of Association (MoA) and Additional Curriculum to ensure smooth implementation of the initiative.

A website <https://sainikschool.ncog.gov.in> in collaboration with Bhaskaracharya National Institute for Space Applications and Geo-informatics (BISAG-N) was launched and the registration opened for affiliation on October 12, 2021. Till date, 137 applicants have registered on the web portal.

Chief of the Army Staff General MM Naravane, Chief of the Air Staff Air Chief Marshal VR Chaudhari, Chief of the Naval Staff Admiral R Hari Kumar and Secretary Department of School Education and Literacy Smt Anita Karwal were among those who attended the seminar virtually.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1788536>



पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Sat, 08 Jan 2022 1:18PM

रक्षा मंत्री श्री राजनाथ सिंह ने कहा कि 100 नए सैनिक विद्यालय लड़कियों को सशस्त्र बलों में शामिल होने के अधिक अवसर प्रदान करेंगे

उन्होंने शिक्षा में गुणवत्ता और नवाचार को बढ़ावा देने के लिए सैनिक विद्यालयों की रैंकिंग का सुझाव दिया

निजी क्षेत्र, शिक्षा और बच्चों के समय विकास में 'आत्मनिर्भरता' की एक क्रांति ला सकता है: रक्षा मंत्री

रक्षा मंत्री श्री राजनाथ सिंह ने 8 जनवरी, 2022 को सैनिक विद्यालयों पर एक वेबीनार की अध्यक्षता की। इस दौरान उन्होंने कहा, "100 नए सैनिक विद्यालयों की स्थापना से लड़कियों को सशस्त्र बलों में शामिल होने और राष्ट्रीय सुरक्षा में अपना योगदान करने का अवसर मिलेगा।" श्री राजनाथ सिंह ने बताया कि सरकार सशस्त्र बलों में महिलाओं की भूमिका को बढ़ाने में विश्वास रखती है और इस दिशा में लगातार कई कदम उठाए गए हैं। इनमें सैनिक विद्यालयों में लड़कियों के नामांकन का रास्ता साफ करना और महिला अधिकारियों को स्थायी कमीशन प्रदान करना शामिल है। उन्होंने विश्वास व्यक्त किया कि नए सैनिक विद्यालय स्थापित करने का निर्णय लड़कियों को देश की सेवा करने के अपने सपनों को साकार करने के लिए प्रोत्साहित करेगा।

रक्षा मंत्री ने सैनिक विद्यालयों के विस्तार की घोषणा को पिछले छह-सात वर्षों में बच्चों की बुनियादी शिक्षा की गुणवत्ता में सुधार और देश के समय विकास को सुनिश्चित करने के लिए सरकार के कई महत्वपूर्ण निर्णयों में से एक बताया। उन्होंने उम्मीद व्यक्त की कि आने वाले समय में सैनिक विद्यालयों में *रक्षा और शिक्षा* का एकीकरण राष्ट्र के निर्माण में एक महत्वपूर्ण भूमिका निभाएगा। उन्होंने कहा कि जहां 'सैनिक' एकता, अनुशासन और निष्ठा को दर्शाता है। वहीं 'विद्यालय' शिक्षा का केंद्र है। इस आधार पर सैनिक विद्यालय बच्चों को सक्षम नागरिक बनाने में एक महत्वपूर्ण भूमिका निभा रहे हैं।

श्री राजनाथ सिंह ने आगे कहा कि सरकार देश के युवाओं को गुणवत्तापूर्ण शिक्षा प्रदान करने पर ध्यान केंद्रित कर रही है, क्योंकि यह समाज के सर्वांगीण विकास के लिए एक मजबूत नींव रखती है। उन्होंने कहा, "गुणवत्तापूर्ण शिक्षा संयुक्त राष्ट्र के अपनाए गए 17 सतत विकास लक्ष्यों का आधार है। 'गुणवत्तापूर्ण शिक्षा' के तहत कई अन्य लक्ष्य हैं। इन लक्ष्यों की प्राप्ति को लेकर हमारी मजबूत राजनीतिक प्रतिबद्धता रही है। सर्व शिक्षा अभियान और राष्ट्रीय माध्यमिक शिक्षा अभियान जैसी कई योजनाएं संचालित की जा रही हैं। इस दिशा में 100 नए सैनिक विद्यालयों की स्थापना एक और महत्वपूर्ण कदम है।"

रक्षा मंत्री ने स्वामी विवेकानंद, महात्मा गांधी, डॉ. बी.आर. आंबेडकर और सर्वपल्ली राधाकृष्णन जैसे दूरदर्शी विचारकों के आदर्शों को लागू करने के लिए सैनिक स्कूल सोसाइटी की सराहना की, जिन्होंने शैक्षणिक शिक्षा के साथ-साथ बच्चों के शारीरिक, मानसिक, नैतिक और आध्यात्मिक विकास पर जोर दिया। उन्होंने इस बात की सराहना की कि अब तक सैनिक विद्यालयों ने सशस्त्र बलों में 7,000 से अधिक अधिकारियों की भर्ती में अपना योगदान दिया है। साथ ही, देश को नगालैंड के मुख्यमंत्री श्री नेफ्यू रियो, आरबीआई के पूर्व गवर्नर डी सुब्बाराव और फिल्म निर्देशक राकेश रोशन सहित देश के पूर्व सेनाध्यक्ष जनरल दीपक कपूर (सेवानिवृत्त) और जनरल दलबीर सिंह सुहाग (सेवानिवृत्त) जैसे अधिकारी दिए हैं।

श्री राजनाथ सिंह ने शिक्षा को एक महत्वपूर्ण क्षेत्र बताया, जो अन्य सभी क्षेत्रों के विकास में एक भूमिका निभाता है। उन्होंने निजी क्षेत्र से इसमें 'आत्मनिर्भरता' की सोच को प्राप्त करने और बच्चों के समग्र विकास को सुनिश्चित करने के लिए सरकार के साथ आने का अनुरोध किया। उन्होंने आगे कहा निजी क्षेत्र से सरकार की सैनिक विद्यालयों के विस्तार की पहल में शामिल होने का आग्रह किया। रक्षा मंत्री ने कहा, "आज हमारा देश हर क्षेत्र में आत्मनिर्भरता के पथ पर तेजी से आगे बढ़ रहा है। यह सार्वजनिक और निजी क्षेत्रों के बीच सामंजस्य के चलते रक्षा, स्वास्थ्य, संचार, उद्योग और परिवहन जैसे क्षेत्रों में नई ऊंचाइयों को छू रहा है। शिक्षा के क्षेत्र में एक क्रांति और बच्चों के सर्वांगीण विकास की जरूरत है। रक्षा, शिक्षा और निजी क्षेत्र के बीच मजबूत सहभागिता की स्थिति में ही ऐसा संभव है। यह वेबीनार इस साझेदारी की एक नींव है।"

रक्षा मंत्री ने देश के युवाओं को अवसर प्रदान करने के लिए सरकार के संकल्प को दोहराया। रक्षा मंत्री ने बताया कि राष्ट्रीय शिक्षा नीति-2020; राष्ट्रीय कैडेट कोर की रिक्तियों में बढ़ोतरी; खेलो इंडिया, स्टार्ट-अप इंडिया और फिट इंडिया अभियान प्रधानमंत्री श्री नरेन्द्र मोदी की कुछ ऐसी पहलें हैं, जिसके जरिए देश के युवा और प्रज्ज्वलित मस्तिष्क अपने सपनों को साकार कर सकते हैं, समग्र विकास को सुनिश्चित कर सकते हैं और देश को नई ऊंचाइयों पर ले जा सकते हैं। उन्होंने आगे कहा कि नए सैनिक विद्यालयों की स्थापना इस दिशा में एक महत्वपूर्ण उपलब्धि साबित होगी।

श्री राजनाथ सिंह ने रक्षा विभाग और सैनिक स्कूल सोसायटी को सभी सैनिक विद्यालयों को उनके प्रदर्शन और ऑडिट के आधार पर रैंकिंग के लिए एक प्रणाली तैयार करने का सुझाव दिया। उन्होंने आगे कहा कि इससे विद्यालयों के बीच स्वस्थ प्रतिस्पर्धा को बढ़ावा मिलेगा। साथ ही, विभिन्न नवाचारों के उपयोग की कोशिश को प्रोत्साहन भी मिलेगा। रक्षा मंत्री ने कहा कि पाठ्यक्रम के साथ-साथ बच्चों को देशभक्ति और राष्ट्र के प्रति निष्ठा से अवगत कराया जाना चाहिए, क्योंकि इससे उनके चरित्र निर्माण में सहायता मिलेगी और देश को भी लाभ होगा।

इससे पहले 12 अक्टूबर, 2021 को प्रधानमंत्री श्री नरेन्द्र मोदी की अध्यक्षता में केंद्रीय कैबिनेट की बैठक में सैनिक स्कूल सोसायटी के साथ संबद्धता के आधार पर एनजीओ/निजी विद्यालयों/राज्य के स्वामित्व वाले विद्यालयों के साथ साझेदारी में सैनिक विद्यालय की स्थापना के प्रस्ताव को मंजूरी दी गई थी। ये विद्यालय एक विशिष्ट आधार के रूप में काम करेंगे, जो मौजूदा सैनिक विद्यालयों से अलग और विशेष होंगे। पहले चरण के तहत राज्यों/एनजीओ/निजी भागीदारों से 100 संबद्ध साझेदारों को तैयार करने का प्रस्ताव किया गया है।

इस वेबीनार का आयोजन इस पहल के सुचारु कार्यान्वयन को सुनिश्चित करने के लिए एक ठोस योग्यता जरूरत (क्यूआर), उप-नियम संबद्धता, मेमोरेंडम ऑफ एसोसिएशन (एमओए) और अतिरिक्त पाठ्यक्रम विकसित करने के संबंध में हितधारकों के परामर्श के लिए किया गया था।

भास्कराचार्य नेशनल इंस्टीट्यूट फॉर स्पेस एप्लीकेशन्स एंड जियो इन्फॉर्मेटिक्स (बीआईएसएजी-एन) की सहभागिता से एक वेबसाइट <https://sainikschool.ncog.gov.in> शुरू की गई और इसके जरिए 12 अक्टूबर, 2021 को संबद्धता के लिए पंजीकरण की शुरुआत की गई। अब तक 137 आवेदकों ने इस वेब पोर्टल पर अपना पंजीकरण कराया है।

इस सेमिनार में थल सेनाध्यक्ष जनरल एमएम नरवणे, वायु सेना प्रमुख एयर चीफ मार्शल वीआर चौधरी, नौसेना अध्यक्ष एडमिरल आर हरि कुमार व विद्यालयी शिक्षा और साक्षरता विभाग की सचिव श्रीमती अनीता करवाल ने भी वर्चुअल माध्यम के जरिए हिस्सा लिया।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1788585>

वायु शक्ति-2022: आज पोखरण में पावर डिमॉन्स्ट्रेशन करेगी IAF, 150 से अधिक फाइटर प्लेन करेंगे ताकत का मुजाहिरा

फायर पावर डिमॉन्स्ट्रेशन (एफपीडी) का यह दूसरा संस्करण है, जिसे 2013 और 2016 में 'आयरन फिस्ट' नाम के साथ आयोजित किया गया था। 'वायु शक्ति' के नाम से 2019 में आयोजित हुए पहले संस्करण में वायुसेना के 140 से अधिक विमानों ने हिस्सा लिया था।

नई दिल्ली: भारतीय वायु सेना (Indian Air Force) ने 10 फरवरी को पोखरण (Pokhran), थार रेगिस्तान में होने वाले 'वायु शक्ति-2022' अभ्यास के दूसरे संस्करण की तैयारियां तेजी से पूरी कर ली हैं। फायर पावर डिमॉन्स्ट्रेशन के दौरान आधुनिक युद्धक्षेत्र में खतरों से निपटने के लिए इंडियन एयरफोर्स की आक्रामक और रक्षात्मक क्षमताओं पर फोकस किया जाएगा। इसमें इलेक्ट्रॉनिक रूप से प्रतिस्पर्धा वाले वातावरण में काम करने की क्षमता और नेटवर्क-केंद्रित युद्ध रणनीतियों का सटीक संचालन करना शामिल है।



वायु शक्ति-2022 में 150 से अधिक लड़ाकू विमान लेंगे हिस्सा

फायर पावर डिमॉन्स्ट्रेशन (एफपीडी) का यह दूसरा संस्करण है, जिसे 2013 और 2016 में 'आयरन फिस्ट' नाम के साथ आयोजित किया गया था। 'वायु शक्ति' के नाम से 2019 में आयोजित हुए पहले संस्करण में वायुसेना के 140 से अधिक विमानों ने हिस्सा लिया था। इसमें सुखोई-30एमकेआई, मिग-29यूपीजी, जगुआर, एलसीए तेजस आदि जैसे फास्ट-मूवर फाइटर जेट से लेकर एमआई-17 जैसे धीमे, लेकिन घातक हेलीकॉप्टर शामिल थे। इसके अलावा पैराड्रूपर्स और यूटिलिटी हेलीकॉप्टरों को शामिल करने वाले समन्वित मिशनों को भी अंजाम दिया गया था। इस अभ्यास का आम जनता के लिए लाइव टेलीकास्ट भी किया गया था।

वायु सेना की आक्रामक और रक्षात्मक क्षमताओं पर फोकस किया जाएगा

इस तरह के आयोजन हमेशा सेनाओं का मनोबल बढ़ाने का कार्य करते हैं, क्योंकि इससे सेनाओं की परिचालन, तत्परता का प्रभावी मूल्यांकन किया जाता है। इस दौरान यह देखने को मिलता है कि आधुनिक युद्ध में विनाश के हथियारों के साथ-साथ नेटवर्क क्षमता के उपयोग से कैसे लक्ष्य को हासिल किया जा सकता है। हर तीन साल में एक बार होने वाले अभ्यास 'वायु शक्ति-2022' के इस दूसरे संस्करण में 150 से अधिक विमानों की भागीदारी देखने को मिलेगी। इसमें दर्जनों राजनयिक और विदेशी अधिकारियों के भी शामिल होने की उम्मीद है। इसमें स्वदेशी उत्पादों के लाइव प्रचार का भी मौका मिलेगा क्योंकि भारत सरकार रक्षा के क्षेत्र में निर्यात का लक्ष्य पूरा करने की तलाश में है।

<https://hindi.asianetnews.com/national-news/air-power-demonstration-in-pokhran-by-indian-air-force-know-all-about-dvg-r5gwbw>

Govt. completes survey of defence land

About 16.38 lakh acres are spread across many pockets outside the cantonments. Out of 16.38 lakh acres of land, about 18,000 acres is either state-hired land or is proposed for deletion from records on account of transfer to other government departments.

New Delhi: In a remarkable achievement, the Ministry of Defence, for the first time since independence, has completed the entire exercise of the survey of about 1.61 lakh acres of defence land inside cantonments and 16.17 lakh acres outside cantonments in the country.

The survey has been completed by using the latest survey technology and in a large number of pockets in association with the revenue authorities of various state governments.

”The magnitude of land holding, location of land in approximately 4,900 pockets across the country, inaccessible terrain in many places and association of various stakeholders makes this survey one of the largest land surveys in the country,” the MoD said today.

As per the records maintained by defence estates offices, the MoD owns large tracts of land measuring about 17.99 lakh acres out of which about 1.61 lakh acres is situated within the 62 notified cantonments.

About 16.38 lakh acres is spread across many pockets outside the cantonments. Out of 16.38 lakh acres land, about 18,000 acres is either state hired land or is proposed for deletion from records on account of transfer to other government departments.

Clear demarcation, boundary survey of defence lands and fixing of the boundaries are necessary for protecting the defence land, safeguarding of the title of MOD, updating land records, maps and preventing encroachments.

Towards this end, the Directorate General Defence Estates of the Ministry of Defence commenced the survey of defence land in October 2018.

Modern survey technologies like Electronic Total Station (ETS) and Differential Global Positioning System (DGPS) were used in the survey. To further speed up the process, Drone imagery and Satellite imagery-based surveys were leveraged for reliable, robust and time-bound outcomes.

For the first time, Drone imagery-based survey technology was used for the survey of lakhs of acres of defence land in Rajasthan. The entire area was surveyed with the help of the Surveyor General of India in a matter of weeks, which earlier used to take years.

Besides this, a satellite Imagery based survey was done for the first time for many defence land pockets, especially for certain pockets again measuring lakhs acres of defence land.

3D modelling techniques for better visualisation of defence land in hilly areas have also been introduced by utilising Digital Elevation Model (DEM) in association with the Bhabha Atomic Research Centre (BARC).

During the last six months, as a result of the active intervention of the Defence Secretary and use of the latest survey technologies, the survey progressed at a much faster pace, which is evident from the fact that out of 17.78 lakh acres, 8.90 lakh acres was surveyed during the last three months.

As a part of the Survey, a project for a real-time change detection system based on the Time series Satellite imagery for detection of encroachments on defence land has also been initiated. A



pilot test has been carried out on satellite imageries of defence land pockets procured from the National Remote Sensing Centre, Hyderabad.

Geo-referenced and digitised shapefiles are made available to enable quick decision making by officials of DGDE & MoD.

The Association of Revenue officials in the survey will eventually help in reducing boundary disputes amongst stakeholders and would also help in resolving legal disputes at various levels.

Completion of such a humongous survey has been made possible due to Capacity Building of technical personnel and officers of Defence Estates Organisation in latest technologies for Land survey over the years in association with premier institutes like National Remote Sensing Centre and National Institute for Geo-Informatics Science and Technology.

A Centre of Excellence (CoE) on Land Survey and GIS mapping has also been established in NIDEM (National Institute of Defence Estates Management) for capacity building of Defence Estates officials in the field of the latest survey technologies.

The CoE aims to be an apex survey institution capable of imparting training of various levels to the officers of Central & State Govt. Depts. CoE also aims to use SLAM/GIS technologies in better land management & town planning processes.

<https://www.thestatesman.com/india/govt-completes-survey-defence-land-1503037338.html>



Sat, 08 Jan 2022

Jagran Explainer: Indian Navy to conduct flight tests of Rafale-M for INS Vikrant | How is it different from IAF's Rafales

Senior Indian Navy officials said that tests would be conducted on in-service INS Vikramaditya and the soon to be inducted INS Vikrant. India had signed an inter-governmental agreement with France in September 2016 for the procurement of 36 Rafale fighter jets for the IAF.

New Delhi: A Rafale maritime fighter aircraft was sent to a naval facility in Goa on Thursday evening by the Dassault Aviation to demonstrate its abilities to carry out operations from aircraft carriers as India eyes to expand its naval capabilities.

Senior Indian Navy officials, quoted by news agency ANI, have said that tests will begin from Friday and would be conducted on in-service INS Vikramaditya and the soon to be inducted INS Vikrant.

"The aircraft would be carrying out demonstrations with a full load including a dummy weapons package from the Shore-based Test Facility (SBTF) at the Hansa naval air station here," ANI quoted the officials as saying.

In 2017, the Indian Navy had issued a Request for Information (RFI) to procure 57 multi-role combat aircraft for its aircraft carrier. Rafale-M - along with F-18 Super Hornet (Boeing, US), MIG-29K (Russia) and Gripen (Saab, Sweden) - is in contention for the deal.

All you need to know about the Rafale-M variant:

Rafale-M, which entered the service of the French Navy in 2001, is a carrier-borne version of the Rafale fighter jets. It is a twin-engine jet and is slightly different from the original Rafale -



PTI picture

which is being used by the Indian Air Force - as it has a "reinforced undercarriage and nose wheel, a bigger arrester hook, an integrated ladder", reported *Hindustan Times*.

Quoting sources, the leading English daily reported that Rafale-M's dimensions would allow the Navy to have 14 such fighter jets at the INS Vikramaditya.

Rafale-M, which can carry up to four to five tonnes of external load, can also carry nuclear-capable missiles, along with SCALP, Hammer and Meteor missiles.

Sources - quoted by various news agencies, including PTI, - suggest that Rafale-M is the frontrunner to be inducted into the Navy. Here it should be noted that it is the only non-US fighter-type cleared to operate from the decks of US carriers.

India had signed an inter-governmental agreement with France in September 2016 for the procurement of 36 Rafale fighter jets at a cost of around Rs 59,000 crore for the Indian Air Force.

The first batch of five Rafale jets, manufactured by French aerospace major Dassault Aviation, arrived in India on July 29, 2020. Already 33 Rafale jets have been delivered to the IAF by the plane's maker Dassault Aviation.

French Defence Minister Florence Parly, during a visit to India last month, indicated that France will be interested to supply the carrier-based jets. "We know that the aircraft carrier will soon be... that aircraft are needed. We are open and ready to provide any other Rafale if this is India's decision," she said.

<https://english.jagran.com/india/jagran-explainer-indian-navy-to-conduct-flight-tests-of-rafale-m-for-ins-vikrant-how-is-it-different-from-iaf-s-rafales-10037534>



Sat, 08 Jan 2022

Indian Navy Ship lands in Comoros to provide technical assistance

By Sidhant Sibal

Story highlights

Interestingly, the ship docked on the day when Chinese foreign minister (FM) Wang Yi was in Comoros

New Delhi: Indian Naval Ship Kesari arrived at the port of Moroni, Comoros on Friday to extend technical assistance to the Comorian Coast Guard.

The visit came in response to the request made by the Chief of Comorian Coast Guard Commander Moudjib Rahmane Adane to the Indian Navy during his visit to India in November last year to participate in the Goa Maritime Conclave.

The request was to provide technical assistance in repairing a grounded patrol vessel P002-M' kombozi.

A release by Indian mission to Antananarivo, which is also concurrently accredited to Comoros, said, "India has always been a reliable responder to the requests made by Comoros", adding, "Visit of INS Kesari reflects India's commitment to work together with Comoros, its maritime neighbour and partner in the Indian Ocean Region."

India remains committed to further strengthening its development partnership with Comoros that aligns with Prime Minister Narendra Modi's vision of SAGAR that stands for Security And Growth for All in the Indian Ocean Region, the release stated.

Interestingly, the ship docked on the day when Chinese foreign minister (FM) Wang Yi was in the country.



INS Kesari arrives at the port of Moroni, Comoros Photograph:(WION)

The Chinese FM is on a visit to Africa and had earlier visited Ethiopia and Kenya. The visit to Comoros comes even as Beijing has been trying to increase its presence and engagement in the Indian Ocean and the African continent.

Comoros is strategically located at the northern end of the Mozambique Channel in the Indian Ocean Region, between northern Madagascar and northern Mozambique.

This is not the first time that INS Kesari docked in Comoros.

In June 2020, the Indian Naval Ship had supplied a consignment of COVID-19 related essential medicines from India. Arrived on board were a 14-member Indian Medical Assistance Team to work with the Comorian health authorities in dealing with the pandemic and dengue fever.

Other than INS Kesari, March 2021 saw Indian Naval Ship Jalashwa delivering 1000 metric tonnes of rice to the island country.

There has been a spurt in high-level engagements between the two countries recently.

India's vice president Venkaiah Naidu visited the country in 2019 during which 6 MoUs were signed, including in Cooperation in the Field of Defence.

Comoros foreign minister Dhohir Dhoulkamal visited India in February 2021 to participate in the Aero India 2021 and IOR Defence minister conclave in Bengaluru.

Last year, India trained 12 diplomats from the country during the first Special Course for diplomats from the Indian Ocean Region (IOR) organised by Sushma Swaraj Institute of Foreign Service (SSIFS), Delhi.

<https://www.wionews.com/india-news/indian-navy-ship-lands-in-comoros-to-provide-technical-assistance-442921>

THE TIMES OF INDIA

Sat, 08 Jan 2022

Indian Navy in 2021 expanding horizons, pushing boundaries

By Captain Pradeep Raman

Seas permit free flow of commerce and ideas. India is essentially a maritime nation and the last decade has witnessed substantial expansion in India's dependence on her maritime environment. Our unique geographic location bestows upon us unmatched advantages as we sit astride some of the world's most critical Sea Lines of Communication (SLOCs). 70% of our trade by value and 90% by volume is through the sea. Moreover, 99% of our communications are running through undersea cables. The Indian Navy (*IN*) is the principal manifestation of India's maritime influence in the Indian Ocean Region (IOR). It has come a long way from what it was at India's independence, and has transformed into a multi-dimensional, highly capable, blue-water force, ready to address threats and challenges in the maritime domain. Thanks to the vision of its perspicacious forbearers, today's Indian Navy has acquired adequate capability to meet all challenges in its Primary and Secondary Areas of Interest. A professional force, the Indian Navy is now a pre-eminent maritime power in the IOR and the Indo-Pacific.

A multi-dimensional force capable of operating above, below and on the ocean surface, over land, across the electronic spectrum and also in space, the Navy has maintained enhanced preparedness and op posture throughout 2021. Periodic firing of long-range precision weapons were undertaken to hone '*Ordnance on Target*' skills, and for strategic signalling to potential adversaries. Contingencies across emergent spectrum of operations were also war-gamed and refined during the pan-Navy Theatre-level Exercises TROPEX, conducted early in the year. Mission Deployed ships at key locations in the IOR, near-continuous maritime air surveillance using aircraft and RPAs, and the Information Fusion Centre (IFC-IOR) at Gurugram, all have helped build a comprehensive maritime picture. At any time, there are warships patrolling the Bay

of Bengal, Malacca Strait, Andaman Sea, Southern IOR, Central IOR, Gulf of Aden and the Persian Gulf and this has facilitated swift response to developing situations.

A warship deployed 24x7x365 on *Operation Sankalp* in the Gulf since June 2019 has provided protection to Indian merchantmen passing through the Strait of Hormuz. The Indian Navy, in consultation with its other maritime neighbours like Sri Lanka and Maldives, have also been proactively engaged in counter-narcotics operations to tackle a steady flow of drugs from the Makran coast, down to the East coast of Africa from where it moves to the island nations, which are tourism dependent economies, and then to Sri Lanka and India and also across the world. Near-coast surveillance is also coordinated by the Navy by synchronising the resources of nearly 20 government agencies to draw an electronic fence over our coastline, to deter any 26/11 type incident.

There has been increased deployment of the Indian Navy for HADR missions in the past year. Deployed for nearly two months as part of *Operation Samudra Setu II* in end April, warships made numerous trips amidst the brutal second wave of COVID-19, traversing nearly 100,000 km to bring LMO, oxygen cylinders, oxygen containers and other critical medical aid from friendly foreign countries. Most notably, *IN Ships* and aircraft were extensively deployed for days as part of rescue operations during *Cyclone Tauktae* in May. A total of 188 survivors were rescued in the operation.

Under Mission SAGAR, the Navy has also been proactively engaging with countries in the region undertaking numerous humanitarian operations and Covid-19 related assistance spanning the entire extent of the Indian Ocean including South/ South East Asia and East Africa. Indian Navy ships have also on many occasions been requested to render assistance to vessels at sea. In March, *INS Talwar* rendered assistance to a cargo vessel, comprising seven Indian crew, which was adrift in Gulf of Oman owing to machinery failure. Survey ship *Sarvekshak* was also deployed to Colombo in June for providing survey assistance to assess/ locate debris of Singaporean flagged ex- *MV Xpress Pearl*, which sank off Colombo harbour due to fire onboard. In end July, *IN Ship Airavat* responded to the distress call from Indian fishing vessel '*Selath Matha II*' off Car Nicobar Island and towed her to safety. More recently, in end September, an Advanced Light Helicopter from Indian Navy's Southern Naval Command at Kochi undertook medical evacuation of a Filipino crew from merchant vessel *MV Lyric Poet* off Kochi.

Through its deployments and outreach, the Indian Navy has also been a key instrument of India's foreign policy and been seeking collaboration with friendly and like-minded nations with interests in the wider Indo-Pacific. Besides the challenges posed by Covid-19 pandemic, the Indian Navy has conducted nearly 28 bi-/multi-lateral exercises and operational engagements, eight Coordinated Patrols, and close to 30 Maritime Partnership Exercises (MPXs) with friendly foreign countries. Back-to-back bilateral and multi-lateral exercises/ operations like AUSINDEX, INDRA, JIMEX, KONKAN, MALABAR, SLINEX, SIMBEX, SITMEX, VARUNA, etc with regional and extra-regional navies is evidence that the global comity recognises the Indian Navy's efforts of the past decades. The gains accrued by these exercises are further enhanced by the full spectrum of military education and training offered by the Indian Navy to friendly foreign countries. In recent times, the Navy has also deployed mobile training teams to provide specific, tailored and practical training to regional partners at their own establishments whenever such interactions have been sought. This has led to far greater levels of understanding and trust, which are veritable force multipliers when working together to address shared challenges.

As India strides forward with clear purpose and steadfast intent, embracing its role as a key pillar of the emerging global order, the Indian Navy has exemplified the quiet confidence and potent capabilities of our nation. The wide range of activities undertaken by Indian Navy in 2021 are a true reflection of New India, which stands ready to work individually and in partnership with its friends to create an environment conducive to inclusive development and prosperity across the region.

<https://timesofindia.indiatimes.com/blogs/voices/indian-navy-in-2021-expanding-horizons-pushing-boundaries/>

India braces for South East Asia test as China pushes defence deals

By Dipanjan Roy Chaudhury

Synopsis

China Electronic & Technological Corporation International is at the forefront of coordinating with companies in SE Asia for marketing and establishing production facilities including in defence and intelligence-related technology and social media management systems, ET has learnt.

China, through its state-owned enterprise China Electronic & Technological Corporation International (CETCI), has been assiduously making efforts to expand its footprints in the defence sector in South East Asia that could emerge as a security challenge for India in its extended neighbourhood.

CETCI is at the forefront of coordinating with companies in SE Asia for marketing and establishing production facilities including in defence and intelligence-related technology and social media management systems, ET has learnt.

CETCI has been particularly active in Thailand, which shares maritime boundary with India, and Malaysia, and over the last few months, has been working closely with their embassies in Beijing, according to persons who track China's defence ties with SE Asia. CETCI is also trying to get active in Indonesia, whose defence ties with India are being upgraded.

In both Malaysia and Indonesia, CETCI is working to supply weapon-locating radars. Besides, it is also promoting the National Comprehensive Tactical Intelligence System in Indonesia. Interestingly, besides the Philippines and Vietnam, Indonesia is in talks with India for imports of BrahMos missiles jointly developed by New Delhi and Moscow.

Last November, CETCI unveiled plans to market its Electronic Intelligence Equipment (ELINT) for Electronic Warfare with an eye on SE Asian market, ET has learnt. The company also wants to promote technology associated with drones for SE Asian market, ET has learnt. CETCI has also been focussing on marketing its National Firewall System (NFS) and National Social Media Engagement System (NSMES) in SE Asia, according to one of above mentioned persons.

The NFS is being introduced as a cyberspace governance solution for protection of a country's cyberspace sovereignty, while NSMES, based on Big Data and Artificial Intelligence, is primarily for the management of social media platforms and public opinion engagement. Both these tools are reportedly developed by Chengdu Pravis Technology Co Ltd.

Despite quality issues, Chinese defence equipment has been able to increase its market share in SE Asia due to factors such as competitive pricing, maintenance and transfer of technology, policy of non-interference and refraining from putting conditions unlike the USA and the West.

<https://economictimes.indiatimes.com/news/defence/india-braces-for-south-east-asia-test-as-china-pushes-defence-deals/articleshow/88796458.cms>

Aselsan's Zargana to protect Pakistan's Agosta 90B submarines against torpedoes

Turkey's leading defence company Aselsan has completed factory acceptance tests (FAT) of the Zargana Torpedo Countermeasure System for the Pakistan Navy's Agosta 90B-class submarines mid-life upgrade (MLU) project.

By Tayfun Ozberk

The tests of Zargana were attended by Pakistan's Attachee, a Pakistan Navy representative, and STM Defence officials, according to Aselsan's most recent bulletin. The FATs were also carried out as part of Zargana's integration with Indonesian submarines.

Aselsan made the initial announcement of the export of the Zargana torpedo countermeasure system to Pakistan in May 2019. The contract is part of the Pakistan Navy's Agosta 90B MLU program, which includes the modernization of three Agosta 90B submarines under a contract signed in 2016 with the Turkish STM Company as the prime contractor. STM officials revealed during the Naval Systems Seminar held in Ankara on 15 and 16 November that they delivered the first modernized submarine, PNS Hamza. According to multiple OSINT reporters, the second submarine's upgrade is complete.

Because officials did not disclose relevant information, it is unknown when the next trials will take place or which submarine will be equipped. The best option appears to be outfitting the third Agosta 90B-class submarine, PNS Saad (S-138), which is currently being modernized.

In the same bulletin, Aselsan announced that it had completed the FAT of its MITOSTM WECDIS (Warship Electronic Chart Display), an electronic map-based navigation system that assists navigation by providing information compatible with current electronic maps and provides route planning and route tracking capability to navigation personnel, for the Pakistan Navy's first Babur-class corvette.

The defense industry collaboration between Turkey and Pakistan has grown year after year. Aside from the MLU of Agosta 90B submarines, Turkey is building four Babur-class (PN MILGEM) corvettes for the Pakistan Navy. Though officials did not provide any details regarding Pakistan's Jinnah-class frigate project, officials from KUASAR Marine, a Turkish engineering firm, informed Naval News in an interview that they will be in charge of the frigate's design.

About ZARGANA – Torpedo Counter Measure System

ZARGANA Submarine Torpedo Countermeasure System ensures submarine survivability against torpedo attacks by quick reaction capabilities, provided with the operator-controlled autonomous operation and outboard launchers.

ZARGANA System comprises; Quick reaction capability, adaptable launching cell configuration as per user requirements up to 24 launching cells, single and salvo launching capabilities, high level of redundancy, bubble-free launching.

ZARGANA System uses ZOKA Acoustic jammers and decoys. Acoustic jammer is a broadband high power acoustic noise generator that covers all operating frequency bands of both classical and modern acoustic homing torpedoes operating in passive, active, or combined homing modes. As a softkill measure, acoustic decoys are aimed to deceive incoming torpedoes by emulating dynamic and acoustic behaviors of the submarine.



Aselsan Zargana Torpedo Countermeasure System for submarines (Screenshot from SSB Product Catalogue)

Zargana system was fitted Turkish Navy's PREVEZE-class (Type 209/1400) submarines, which was spotted by Yoruk Isik and released on Twitter in January 2021.

<https://www.navalnews.com/naval-news/2022/01/aselsans-zargana-to-protect-pakistans-agosta-90b-submarines-against-torpedoes/>



Sat, 08 Jan 2022

India, China army commanders to meet on Jan 12, spotlight on Hot Spring

The Indian and Chinese sides have done considerable work on addressing differences at Hot Spring. The Indian side was hopeful of disengagement at this friction point at the October 10 round of talks but there was no headway.

By Rezaul H laskar

New Delhi: India and China are expected to hold the next round of talks between senior military commanders on January 12 to take forward disengagement at key friction points in Ladakh sector of the Line of Actual Control (LAC), people familiar with the matter said on Friday.

The upcoming talks are likely to focus on disengagement at Hot Spring, one of the main friction points in the military standoff, which began in May 2020 and has taken bilateral relations to an all-time low.

The talks on January 12 are expected to be held at Chushul on the Indian side of the LAC as the last round was held on the Chinese side.

The 13th and most recent round of talks between corps commanders of the two sides was held at Chushul-Moldo border meeting point on October 10 last year and ended without any breakthrough. Since then, the Indian side has made several proposals for the 14th round of talks along with agenda items, but the Chinese side's response has not been consistent, the people cited above said.

The Indian side has been maintaining that all friction points between Depsang and Chumar should be collectively tackled in the military talks to ensure comprehensive disengagement and de-escalation in Ladakh sector, but this has not been agreed to by the Chinese side.

The two sides have done considerable work on addressing differences at Hot Spring and the Indian side was hopeful of disengagement at this friction point at the last round of talks. However, the talks on October 10 were not attended by the Chinese corps commander, and he was represented by a deputy who contended he didn't have the authority to make a final decision, the people said.

Following the talks on October 10, the Indian Army said in a statement that it made "constructive suggestions for resolving the remaining areas but the Chinese side was not agreeable and also could not provide any forward-looking proposals".

After the last meeting of the India-China Working Mechanism for Consultation and Coordination (WMCC) on border affairs on November 18, the Indian side had said the 14th round of military talks should be held at "an early date to achieve the objective of complete disengagement from all the friction points along the LAC...in accordance with the existing bilateral agreements and protocols".

At the external affairs ministry's media briefing on Thursday, spokesperson Arindam Bagchi referred to China's recent action of renaming 15 locations in Arunachal Pradesh and said: "We



India has linked the normalisation of overall ties with China to the resolution of the standoff at multiple locations in the Ladakh sector along the Line of Actual Control (LAC). (PTI)

hope that instead of engaging in such antics, China will work constructively with us to resolve the outstanding friction points in areas along the western sector of the LAC in India-China border areas.”

The two sides withdrew frontline troops at Pangong Lake and Gogra last year after several rounds of talks, but there has been no headway in disengagement at other friction points since August 2021. India has linked the normalisation of overall ties with China to the resolution of the standoff.

Tens of thousands of Indian and Chinese troops have dug in for the second successive winter in Ladakh sector, with no immediate signs of an end to the standoff that resulted in the first fatalities along the LAC since 1975. Twenty Indian soldiers and at least four Chinese troops were killed in a brutal clash at Galwan Valley in June 2020.

<https://www.hindustantimes.com/india-news/india-china-army-commanders-to-meet-on-jan-12-spotlight-on-hot-spring-101641575086890.html>



Sat, 08 Jan 2022

As hypersonic and space threats loom, US and Japan launch new defence collaboration

Foreign and defence ministers of the United States and Japan met virtually to discuss stepping up security ties amid a focus on Japan's role as tensions continue to rise over Taiwan and North Korean missile threats.

Washington/Tokyo: The United States and Japan will sign a new defence collaboration deal to counter emerging defence threats, including hypersonics and space-based capabilities, US Secretary of State Antony Blinken said on Thursday.

Foreign and defence ministers of the United States and Japan met virtually to discuss stepping up security ties amid a focus on Japan's role as tensions continue to rise over Taiwan and North Korean missile threats.

Blinken said the US – Japan alliance “must not only strengthen the tools we have, but also develop new ones”, citing Russia's military buildup against Ukraine, Beijing's “provocative” actions over Taiwan and North Korea's latest missile launch.

North Korea fired a “hypersonic missile” this week that successfully hit a target, its state news agency said.

Russia, China and the United States are also racing to build hypersonic weapons whose extreme speed and manoeuvrability makes them hard to spot and block with interceptor missiles.

“We're launching a new research and development agreement that will make it easier for our scientists, for our engineers and program managers to collaborate on emerging defence related issues, from countering hypersonic threats to advancing space based capabilities,” Blinken said at the opening of the meeting. US Defence Secretary Lloyd Austin said that the meeting would help lay down a framework for the future of the security alliance, including evolving missions to “reflect Japan's growing ability to contribute to regional peace and stability.”

“As its neighbouring countries are testing hypersonic missiles, Japan has been working on electromagnetic “railgun” technology to target those missiles,” he said.

Japanese Prime Minister Fumio Kishida's government had approved a record defence spending last month, with a 10th straight annual increase in 2022.



U.S. Secretary of State Antony Blinken said that US - Japan alliance "must not only strengthen the tools we have, but also develop new ones". (REUTERS)

Top Japanese officials have said that developing enemy base strike capabilities is an option to consider to boost defence, but some experts say a move like this might hit hurdles such as the theme of pacifism in domestic politics.

Japanese Foreign Minister Yoshimasa Hayashi told his US counterparts that the international community faces challenges including “unilateral corrosive attempts to change the status quo, abusive use of unfair pressure and the expanding authoritarian regimes.”

The two nations will also sign a new five-year agreement covering the continued basing of US troops in Japan, Blinken said, in a deal where Japan has said that it agreed to pay \$9.3 billion to share the upkeep of US forces in Japan over five years.

<https://indianexpress.com/article/world/as-hypersonic-and-space-threats-loom-us-and-japan-launch-new-defence-collaboration-7711195/>

Science & Technology News

THE TIMES OF INDIA

Mon, 10 Jan 2022

Gaganyaan crew will have 2 landing choices: ISRO expert

By Surendra Singh

New Delhi: The country’s maiden manned mission to space, Gaganyaan, which is targeted to send two-three gagannauts to space for seven days, is set to have two landing site choices, a senior Isro official handling the mission said.

The crew module will be splashing down near the Indian coast in 2023 after it returns from the week-long mission, and the Arabian Sea, which is comparatively calmer, is the primary choice though the Bay of Bengal is also being considered as a backup option, wrote Dr Unnikrishnan Nair S, director, Human Space Flight Centre (HSFC), ISRO, Bengaluru, in an article ‘Indian Human Space Mission’ in a publication.

While in orbit, the orbital module (OM) will be orbiting the Earth with a velocity of about 7,800 metre/second. The crew module, a habitat of astronauts, has an ablative thermal protection system (TPS) to protect it during the intense aerodynamic heating during the flight, Nair wrote. The orbital module will be launched by a human-rated GSLV MK-III vehicle.

For Gaganyaan, the four selected gagannauts have undergone generic space flight training in Russia for nearly 15 months and will now undergo training at the Astronaut Training Facility, being set up at Bengaluru. The crew will undergo training in weightlessness condition by flying in special aircraft through a parabolic path that will give 25 to 30 seconds duration of weightlessness. To familiarise the crew with rescue under abort conditions, they will undergo special survival training in sea, snow, mountain and desert conditions.

Before the final manned mission, Isro has scheduled to send a ‘vyommitra’ (a human-like robot) to space in two unmanned missions, one of the missions is likely to be launched around this year.

<https://timesofindia.indiatimes.com/india/gaganyaan-crew-will-have-2-landing-choices-isro-expert/articleshow/88797692.cms>

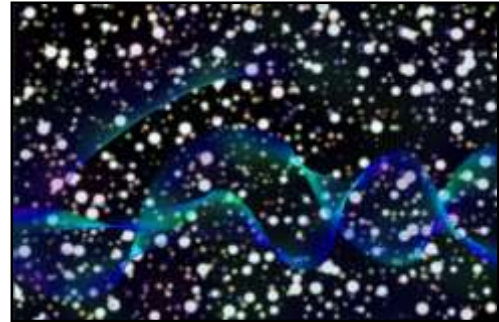


The crew module will be splashing down near the Indian coast in 2023 after it returns from the week-long mission. Arabian Sea is the primary choice

Integrated photonics for quantum technologies

An international team of scientists, headed up by Paderborn physicist Professor Klaus Jöns, has compiled a comprehensive overview of the potential, global outlook, background and frontiers of integrated photonics. The paper—a roadmap for integrated photonic circuits for quantum technologies—has now been published in *Nature Reviews Physics*. The review outlines underlying technologies, presents the current state of play of research and describes possible future applications.

"Photonic quantum technologies have reached a number of important milestones over the last 20 years. However, scalability remains a major challenge when it comes to translating results from the lab to everyday applications. Applications often require more than 1,000 optical components, all of which have to be individually optimized. Photonic quantum technologies can, though, benefit from the parallel developments in classical photonic integration," explains Jöns. According to the scientists, more research is required. "The integrated photonic platforms, which require a variety of multiple materials, component designs and integration strategies, bring multiple challenges, in particular signal losses, which are not easily compensated for in the quantum world," continues Jöns. In their paper, the authors state that the complex innovation cycle for integrated photonic quantum technologies (IPQT) requires investments, the resolution of specific technological challenges, the development of the necessary infrastructure and further structuring towards a mature ecosystem. They conclude that there is an increasing demand for scientists and engineers with substantial knowledge of quantum mechanics and its technological applications.



Credit: CC0 Public Domain

Integrated quantum photonics uses classical integrated photonic technologies and devices for quantum applications, whereby chip-level integration is critical for scaling up and translating laboratory demonstrators to real-life technologies. Jöns explains that "efforts in the field of integrated quantum photonics are broad-ranging and include the development of quantum photonic circuits, which can be monolithically, hybrid or heterogeneously integrated. In our paper, we discuss what applications may become possible in the future by overcoming the current roadblocks." The scientists also provide an overview of the research landscape and discuss the innovation and market potential. The aim is to stimulate further research and research funding by outlining not only the scientific issues, but also the challenges related to the development of the necessary manufacturing infrastructure and supply chains for bringing the technologies to market.

According to the scientists, there is an urgent need to invest heavily in education in order to train the next generation of IPQT engineers. Jöns says that "regardless of the type of technology that will be used in commercial quantum devices, the underlying principles of quantum mechanics are the same. We predict an increasing demand for scientists and engineers with substantial knowledge of both quantum mechanics and its technological applications. Investing in educating the next generation will contribute to pushing the scientific and technological frontiers."

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More information: Emanuele Pelucchi et al, The potential and global outlook of integrated photonics for quantum technologies, *Nature Reviews Physics* (2021). DOI: [10.1038/s42254-021-00398-z](https://doi.org/10.1038/s42254-021-00398-z)
<https://phys.org/news/2022-01-photonics-quantum-technologies.html>

