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# समाचार पत्रों से चयित अंश Newspapers Clippings

A Daily service to keep DRDO Fraternity abreast with DRDO Technologies, Defence Technologies, Defence Policies, International Relations and Science & Technology

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## **India, now a missile exporter**

On the threshold of joining the elite club of select countries in exporting critical defence products, India shall, therefore, be exporting BrahMos missiles to the Philippines about which due confirmation in the form of signing of a contract worth USD 374 million took place recently between BrahMos Aerospace Pvt. Ltd and the Philippines Defence Ministry. In other words, first of such contracts in respect of exporting of the Missile is worth Rs.2244 crore. Philippines as the South East Asian nation is in dire need to bolster its defence capabilities looking to the growing hegemony and belligerence of China. Vietnam, similarly facing the threat from China, could also buy the cruise missiles from India. This missile, one of the fastest supersonic cruise missiles in the world, developed by Indo-Russian joint venture can be launched from submarine, ships, aircraft or land capable of a speed between 2100 to 2300 mph thus making it the most viable and effective cruise missile.

The Indian Armed forces, it may be underlined, have already inducted these missiles thus giving more edge to acquiring of latest weapons system to defend our territories. It is to be seen to be felt proud of- that a country which usually imported almost all of its defence requirements, is now becoming a major exporter of arms and sophisticated defence equipment. In this connection, Union Defence Minister, last year had already confirmed about export of different types of missile systems, Light Combat Aircraft, helicopters, multipurpose light transport aircraft, warships, tanks, artillery gun systems, radars, military vehicles and the list is long.

Since it is the era of electronic warfare, products in respect of that area too are being exported hence the basket of the items of exports from India being not only traditional ones but by putting critical defence products and services, a new horizon in exports portfolio of the country has emerged. Not only the public sector, but due involvement of private sector in manufacturing defence products has given new dimensions to making of defence products besides leapfrogging towards achieving more mile stones in self sufficiency or "Atmanirbarta." Despite the constraints of COVID, exports of various types of defence equipment in 2020-21 stood at Rs.8500 crore and with the export of BrahMos missiles, the marked effect on the earnings through exports shall be increasingly felt. This is so, only in respect of this cruise missile many countries besides from the ASEAN region, are showing keen interest and in that context, discussions with the UAE for such sales being in advanced stages as also for export of Aakash missiles are bound to give a fillip to production of varied defence equipment for international markets.

Countries like Indonesia, Vietnam, Thailand, Malasia and Singapore are other ASEAN countries with whom inking of similar contracts in the very near future is expected. Besides countries like Brazil, Chile and Argentina too are identified in the regions which have been in touch with the Union Ministry of Defence for BrahMos missile imports from India. More and more teeth in speed and effectiveness to the missile system being the integral part of the Indian missile technology programme, right from 2001 when the first test launch of the BrahMos took place, numerous test launches ever since till date have taken places from various ships, Mobile Autonomous Launchers, different types of aircraft thus lending the weapon all versatility. It may be recalled that the agreement between the two countries marks a decisive step forward for Prime Minister's Mission

SAGAR and India's Indo-Pacific engagement. Indo-Pacific region, of late, has assumed more importance as the US wants to challenge China in the region in entirety and "SAGAR" vision or Security and Growth for All in the Region championing free and open Indo-Pacific idea has been the great strategic concept of India gaining wide recognition.

<https://www.dailyexcelsior.com/india-now-a-missile-exporter/>

## COVID 19: DRDO's Contribution



Tue, 01 Feb 2022

### Covid-19: Army, Navy, IAF actively vaccinating personnel with precautionary dose, over 20% covered by Jan 21

*An audit of oxygen generation plants, storage capacities, oxygenated beds and ventilators was carried out to ensure they are serviceable if required during the ongoing third wave of the Covid-19 pandemic.*

*By Amrita Nayak Dutta*

The armed forces are actively vaccinating their personnel with the third "precautionary" dose of the Covid-19 vaccine amid the continuing third wave of the pandemic. Latest data available with News18.com shows that over 20% of armed forces' personnel have been vaccinated, while 35% of medical personnel in the three services have been vaccinated till January 21, 10 days since the drive started.

Since the Covid-19 pandemic broke out in 2020, the armed forces were among the first to achieve 100% vaccination for their personnel, who were given Covishield doses.

Defence sources told News18.com that multiple protocols have been undertaken to minimise the spread of the pandemic. This includes a four-pronged strategy — enhanced surveillance, ensuring adherence to Covid-appropriate behaviour, preparation of healthcare facilities and vaccine coverage.

A senior defence official said ships, aircraft and military wagons are on standby to meet any requirement for mobilising critical stores and personnel to manage the pandemic. All military stations are taking precautions to contain the spread of Covid-19.

In an advisory issued to all Army commands on January 28, the integrated HQ of MoD (Army) said that despite a large number of people testing positive in the third wave, hospital admissions have been minimal and thus Covid-related workload on military hospitals has been low.

While earlier there were restrictions placed on leave and temporary duties of personnel, the latest advisory said that leave restriction of medical personnel in the Army should be relaxed. The advisory added that all military hospitals that earlier restricted certain healthcare services, including elective surgeries and OPDs, should be fully operational by 14 February.

#### **DRDO Hospitals, Oxygen Plants Kept Ready**

Sources said Defence Research and Development Organisation (DRDO) hospitals in Delhi, Varanasi, Lucknow, Ahmedabad and Patna are regularly inspected and are ready to cater to any surge in admissions.



A soldier receives a booster dose of Covishield vaccine against Covid-19 at a vaccination centre in New Delhi, on January 12, 2022. (REUTERS/Anushree Fadnavis)

“The medical staff for these facilities has been earmarked and on standby in case of any emergencies,” the official quoted above said.

Sources added that an audit of oxygen generation plants, storage capacities, oxygenated beds and ventilators was carried out to ensure they are serviceable when required. They said additional oxygen generation plants have also been installed at various stations to meet any contingency that may arise.

Last year, when India was reeling under severe oxygen shortage for Covid-19 patients, Germany has sent a massive oxygen plant with the capacity to generate 4,00,000 litres of oxygen to serve DRDO-operated Sardar Vallabhbhai Patel Hospital.

The DRDO had also installed and commissioned 931 medical oxygen plants in 869 hospitals under PM Cares in all districts across the nation with the help of 13 industries who absorbed this technology.

“These plants were designed and developed based on the spin off technology of Onboard Oxygen Generation System (OBOGS) of India’s indigenous fighter aircraft Tejas. All these plants have been made functional and ready to meet the demand of oxygen,” a DRDO official said.

The oxygen plants were sanctioned during the last wave and were ready by October last year.

The DRDO had set up a dedicated makeshift 1,000-bed Covid hospital in Delhi within 10 days during the first wave. Similar hospitals were set up in 12 other locations during the second wave of the pandemic.

The official added that Jammu and Srinagar hospitals were kept operational throughout. All other hospitals were closed before the third wave struck, but were not dismantled and kept ready to open anytime required.

<https://www.news18.com/news/india/covid-19-army-navy-iaf-actively-vaccinating-personnel-with-precautionary-dose-over-20-covered-by-jan-21-4716836.html>

## DRDO on Twitter



31 January 2022



Tue, 01 Feb 2022

### India sells defence equipment to 84 countries including America-UK, now will give BrahMos to Philippines

By Arpit Birtharia

New Delhi: There has been a deal between India and the Philippines regarding the Brahmos supersonic missile (Brahmos). This deal has been done for \$ 374.9 million (Rs 27.89 billion). This is a big step towards a self-reliant India. According to the report, this is the first foreign order for BrahMos. BrahMos missile is one of the fastest supersonic missiles in the world. It has been developed jointly by India and Russia.

It can be released from land, water and air. This ability is called the triad. According to the Ministry of Defense, the speed of BrahMos is 2.8 Mach. The range of this missile is 290 km. It can carry war material weighing 300 kg. India is the second-largest importer of arms in the world. This means that India buys most of its arms and ammunition from abroad.



But in the last few years, India has also made its mark in defence exports. According to the Ministry of Defense, India sells defence-related equipment and weapons to 84 countries of the world. These include countries like America and Britain. India exports bulletproof jackets and helmets to 34 countries. These include big countries like Israel, Japan, Germany, Britain, America and Saudi Arabia. Let us tell you that India also exports armour shields to 4 countries. These include Germany, Mexico, Cambodia and Saudi Arabia.

<https://english.newstracklive.com/news/us-bharat-sells-defense-equipment-to-84-countries-including-britain-now-brahmos-will-give-to-philippines-mc23-nu764-ta334-1208666-1.html>

## ThePrint

Tue, 01 Feb 2022

### Govt working with ‘utmost determination’ to ensure safe and secure India

New Delhi: The government is working with “utmost determination” to ensure a safe and secure India with a focus on achieving self-reliance in the production of military equipment required by the armed forces, President Ram Nath Kovind said on Monday.

In his address to a joint sitting of both houses of Parliament at the start of the Budget Session, Kovind also referred to infrastructure development in border areas, including in the Ladakh region, and said it has provided new strength to the country’s security.

“My government is working with utmost determination to ensure a safe and secure India. Due to the policies of the government in the defence sector, especially in defence production, the country is becoming increasingly self-reliant,” he said.

“Of all the approvals accorded for modernisation of armed forces in the year 2020-21, 87 per cent were from ‘Make in India’ category. Similarly, in 2020-21, preference was accorded to ‘Make in India’ category in 98 per cent of equipment related contracts,” Kovind said.

The president said the armed forces have issued a list of 209 military equipment, which will not be purchased from abroad.

“A list of more than 2,800 defence equipment has also been issued by defence undertakings which will be manufactured domestically,” he noted.

In August 2020, the defence ministry announced that India will stop the import of 101 weapons and military platforms like transport aircraft, light combat helicopters, conventional submarines, cruise missiles and sonar systems by 2024.

A second list, putting import restrictions on 108 military weapons and systems such as next-generation corvettes, airborne early warning systems, tank engines and radars, was issued in May last year.

In his address, the president also referred to the deal to procure 83 Tejas light combat aircraft (LCA) from state-run aerospace behemoth Hindustan Aeronautics Ltd.

“A contract has been signed with Hindustan Aeronautics Limited for manufacture of 83 LCA Tejas fighter aircraft,” he said.

The Rs 48,000 crore deal to procure Tejas aircraft was sealed in February last year. and it was billed as the biggest ever indigenous defence procurement programme.

“The government has also taken important steps for reorganisation of Ordnance Factories into seven Defence PSUs. Besides, the government is also committed to rapidly promote the private sector and start-ups in the defence sector,” Kovind said.

“Our objective is that the products required by our Forces should be developed in India and also manufactured in India,” he said.

The president said infrastructure development in border areas has provided new strength to the country’s security.

“Today, while on the one hand the modern infrastructure of the country is opening ways for development, on the other hand it is also providing new strength to country’s security.

“Border Roads Organisation has constructed a transport-worthy road at 19 thousand feet, the highest altitude for such a road, at Umling La Pass in Ladakh. Even the most remote villages like Demchok in Ladakh, Joling Kong in Uttarakhand and Huri in Arunachal Pradesh have been connected by modern roads,” he said.

<https://theprint.in/india/govt-working-with-utmost-determination-to-ensure-safe-and-secure-india/817228/>

**R. REPUBLICWORLD.COM**

*Tue, 01 Feb 2022*

## **Economic survey 2022 highlights: major reforms in India's defence sector**

*The Economic Survey 2022 indicates key supply-side measures and reforms in the Defence sector. FDI enhanced in Defence sector up to 74% via automatic route*

*By Shivani Sharma*

The Economic Survey 21-22 indicates key supply-side measures and reforms in India's defence sector. The survey highlights the Corporatization of Ordnance Factory Board (OFB) approved and 7 new Defence Public Sector Undertakings created. FDI has been enhanced in Defence sector up to 74% through the automatic route and up to 100% via the government route.

The changes in the FDI policy can be broadly categorized into measures taken to improve foreign participation while protecting Indian industry from opportunistic takeovers, to enhance transparency and rationalization of processes, and steps to monitor and expedite implementation

## Measures taken to allow greater foreign participation

The FDI policy amendments, notified vide Press Note 4 (2020 series) dated 17.09.2020, have been carried out to realize the vision of an AtmaNirbhar Bharat. Now, FDI in defense sector is allowed up to 74% through automatic route (from earlier 49%) for companies seeking new industrial licenses. FDI beyond 74% and up to 100% will be permitted under the Government route. For existing FDI approved holders/defence licensees, infusion of fresh foreign investment up to 49% resulting in change in equity/shareholding pattern can be done by making declaration within 30 days



Image: PTI/@rajnathsingh/Twitter

## Some initiatives taken to fight against COVID-19

**Medical Oxygen Plants:** Defence Research and Development Organisation (DRDO) was entrusted with installing and commissioning 931 Medical Oxygen Plants in 869 hospitals across the nation within six months, funded through the PM-CARES fund. These plants were designed and developed based on the spin-off technology of the Onboard Oxygen Generation System (OBOGS) of India's indigenous fighter aircraft Tejas

**Oxy-Care System:** DRDO developed SPO2 based Oxygen Cylinder Controller (SPOCC) based Medical Oxygen Cylinders to optimally use the available medical oxygen for COVID-19 patients. This system supplies the quantity of oxygen based on an individual's SPO2 levels. This technology was transferred to Bharat Forge Ltd and UFLOW automation. They have supplied 1.5 lakhs such systems to Government hospitals across the country.

**Anti-COVID Drug:** An anti-COVID-19 therapeutic application of the drug 2-deoxy-D-glucose (2-DG) in collaboration with Dr. Reddy's Laboratories, Hyderabad was formulated. Based on results of Phase-II and Phase-III clinical trials, the Drug Controller General of India (DCGI) granted permission for Emergency Use of 2-DG as an adjunct therapy in moderate to severe COVID-19 patients. The drug comes in powder form in a sachet, which is taken orally by dissolving it in water. DRDO has transferred its patented process technology to 13 major Pharma industries. The defence experts expect an enhanced defence budget in 2022 as the government continues with the 5-year modernization plan for the Armed forces.

Defence budget 2022 is set to reflect modernisation plan of the Armed Forces for the next 5 years which is likely to attract a hike in the upcoming budget for the sector. The government is also focused on the acquisition plan for the services. Indian Defence forces are fast-moving ahead to become 'Atmnirbhar' with minimum dependence on foreign weapons, equipment, and technology. In order to achieve self-reliance, the government is also working on the blueprint for 5-year modernization. The government will create Defense Renewal Fund for long-term defence buyers.

In view of the challenge of the China People's Liberation Army in Ladakh and the continued treachery of Pakistan along the Line of Control, a long-term outline of military preparations is being prepared in the Ministry of Defense's Military Department. In order to create a synergy between the three services, the defense budget of this time will be allocated on the basis of the joint modernization roadmap of the three forces.

According to defense sources, in view of the ongoing build-ups along the LAC by China, the Indian side is also ramping up the infrastructure along the Northern borders, there might be an increased budget allocation for the forces. According to the sources the previous years' budget that remained unused can be utilised for the long-term projects that continue this year as special provisions and discussion with Finance ministry.

The Ministry has emphasized that military procurement and construction of infrastructure facilities such as roads and bridges etc. goes on for a long time, so it is not possible to spend the budget in a year.

There have been indications that not only will the budget be arranged for the expenditure in defense sector for one year but also according to the estimate of the next five years in the budget. It



is estimated that this time there will be an increase in the defense budget. A provision of Rs 4 lakh 78 thousand crore was made in the defense budget for the year 2021-22, which also included pension allotment. There was also a provision of more than 1 lakh crores for defense modernization.

The Ministry has sound reasons for more defense budget this time. The target is to complete the work of the integration of the three services in the coming years.

**Major highlights of this year in Defence this year have been:**

- Negative list for 209 items has been issued by the MoD of foreign equipments which will no more be imported.
- A list of 2600 items, equipment and machinery has been issued which will be produced by Indian DPSUs.
- The bigger indigenous acquisition approved this year was 83 LCA Tejas aircrafts.

The upcoming defence corridors in the country are also being fast-tracked and the budget will see a focus on the indigenization plans in the Defence sector. These plans will be instrumental in strengthening the defence forces with the spirit of 'Atmnirbhar Bharat'.

<https://www.republicworld.com/business-news/union-budget-india/economic-survey-2022-highlights-major-reforms-in-indias-defence-sector-articleshow.html>

## THE TIMES OF INDIA

Tue, 01 Feb 2022

### Army Chief visits Sapta Shakti Command in Jaipur

Jaipur: The Chief of the Army Staff (COAS) General MM Naravane was on a visit to the South Western Command HQs here where he was briefed by the commanders and given an update on the operational preparedness.

Following the formal briefing and interactions with the top brass along other officials, the COAS took the time to visit the Amber Fort where he appreciated the glorious past and heritage of the desert state.

The COAS interacted with the commanders of the Sapta Shakti Command and appreciated them for high standards of professionalism and devotion to duty. Army Commander Lt Gen A S Bhinder briefed the COAS about the security preparedness as well.

The South Western Command was formally raised on 15 April 2005 and operationalised on 15 August 2005 at 'Gothic Lines' at Jaipur Military Station. This command, which is the youngest of the Indian Army, is particularly crucial due to the Indo-Pak border and the operational area encompasses across Punjab as well as Rajasthan.

Just couple of months ago, the COAS had reviewed Exercise Dakshin Shakti, which was conducted by the Pune-headquartered Southern Command in the training areas of Rajasthan and Gujarat.

During the Amber Fort tour, he visited Singh Pol, Deewane Aam, 27 Kachari Ganesh Pol, Sheesh Mahal, Mansingh Mahal, Sukh Niwas, etc. places with great interest and said that he feels proud to see this beautiful palace and due to the visit was able to get a closer look at the history as well as cultural heritage of Rajasthan. Also, seeing the crowd of tourists, he said that seeing this crowd, it seems that Amber is very popular among tourists. "I would like to thank all those who made my visit memorable", he added. The palace was visited by the Chief of Army Staff amid tight security ties during which he penned a note in the visitor's book as well.

<https://timesofindia.indiatimes.com/city/jaipur/army-chief-visits-sapta-shakti-command-in-jaipur/articleshow/89260144.cms>



Chief of the Army Staff General MM Naravane (centre) at Amber Fort

## Defence Secy holds talks with senior military official of Oman

New Delhi: Defence Secretary Ajay Kumar on Monday held extensive talks with Oman's Secretary General of Defence Mohammed bin Nasser bin Ali Al-Zabbi on expanding bilateral defence and strategic ties.

The talks were held under the framework of the Joint Military Coordination Committee (JMCC).

Al-Zabbi is currently on a visit to India.

"Had very warm and friendly disc today during 10th JMCC meeting with HE Dr. Mohammed Nasser Al Zaabi, Secretary General Defence of Oman and Omani delegation and worked out plan for deeper defence cooperation," Kumar tweeted.

Al-Zabbi also called on Air Chief Marshal VR Chaudhari and discussed ways to deepen cooperation between air forces of the two countries.

"Dr. Mohammed Nasser Ali Al Zaabi, Secretary General of the Ministry of Defence #Oman called on Air Chief Marshal VR Chaudhari #CAS today.

Avenues to enhance #IAF & #RAFO bilateral military engagement and training cooperation were discussed," the Indian Air Force tweeted.

In September last year, India and Oman inked an agreement for the exchange of white shipping information and boost maritime security cooperation.

The Indian Navy cooperates with the Royal Navy of Oman on many fronts that included operational interactions and training.

Both Navies have been participating in the biennial maritime exercise Naseem Al Bahr since 1993.

<https://theprint.in/india/defence-secy-holds-talks-with-senior-military-official-of-oman/817685/>



## Oman Defence Ministry's Secretary General calls on Air Chief Marshal, discusses bilateral ties

*Notably, Oman is a strategic partner of India and an important interlocutor at the Gulf Cooperation Council, Arab League, and Indian Ocean Rim Association.*

New Delhi: Secretary-General of the Ministry of Defence of Oman Mohammed Bin Nasser Bin Ali AL Zaabi called on Air Chief Marshal VR Chaudhari on Monday and discussed bilateral military engagement and training cooperation.

"Dr Mohammed Nasser Ali Al Zaabi, Secretary-General of the Ministry of Defence #Oman called on Air Chief Marshal VR Chaudhari #CAS today. Avenues to enhance #IAF & #RAFO bilateral military engagement and training cooperation were discussed," the Indian Air Force said in a Tweet.



Chief of Air Staff Air Chief Marshal VR Chaudhari. (File Photo | PTI)

Earlier in the day, Defence Secretary Ajay Kumar and Mohammed Bin Nasser Bin Ali AL Zaabi attended the 11th meeting of the India-Oman Joint Military Cooperation Committee.

Kumar, from the Indian side, said that India is keeping records of all vaccinated individuals digitally with the help of the Aadhar identification system.

Notably, Oman is a strategic partner of India and an important interlocutor at Gulf Cooperation Council (GCC), Arab League and Indian Ocean Rim Association (IORA), said MEA in a statement.

<https://www.newindianexpress.com/world/2022/jan/31/oman-defence-ministrys-secretary-general-calls-on-air-chief-marshal-discusses-bilateral-ties-2413596.html>



Tue, 01 Feb 2022

## Three Rafale Jets with Indian enhancements to reach India soon

*The total strength of Rafale fighters in India will soon be thirty five. The three Rafale jets with Indian enhancements will be reaching India in next two days.*

*By Shivani Sharma*

The total strength of Rafale fighters in India will soon be thirty-five as the three Rafale jets with Indian enhancements will be reaching India in the next two days, according to the defense sources. The last Rafale fighter will arrive in India in April this year, completing the 36 aircraft contract with France. The last fighter will be fitted with all India-specific enhancements.

The three Rafale jets have to take off from Istres-Le Tube airbase northwest of Marseille in southern France, around February 1-2 depending on the weather conditions. These jets will fly continuously to India with mid-air refueling assistance by UAE. The sources in the Defence Ministry also indicated that once India receives all 36 jets, the 32 jets in the initial lots will be flying to France in a phased manner for Indian modification fittings to give Indian Air Force more teeth.

The India specific enhancements on Rafales relate to long-range Meteor air-to-air missiles, low band frequency jammers, advanced communication systems, more capable radio altimeter, radar warning receiver, high altitude engine start-up, synthetic aperture radar, ground moving target indicator and tracking, missile approach warning systems, and very high-frequency range decoys, according to the sources. The last Rafale to reach India in April is known to be integrated with all the above India-specific enhancements.



<https://www.republicworld.com/india-news/general-news/three-rafale-jets-with-indian-enhancements-to-reach-india-soon-articleshow.html>

# Indian Coast Guard Day 2022: Difference between Indian Coast Guard and Indian Navy

*On the 46th Indian Coast Guard Day, we take a look at the basic differences between the Indian Coast Guard and the Indian Navy.*

Indian Coast Guard, abbreviated as ICG, is a government organisation that conducts various operations on the coastal waters of India, throughout the year. The Indian Navy operates on national and international waters and performs functions on a much broader and critical scope and scale. On the 46<sup>th</sup> Indian Coast Guard Day, we take a look at the basic differences between the Indian Coast Guard and the Indian Navy.

## 1. Functions

The Indian Coast Guard patrols coastal waters, prevents smuggling activities, protects the marine ecology and biodiversity, apprehends poachers and assists fishermen. The Indian Navy also tackles sea pirates but is able to collaborate with naval forces of other nations.

## 2. Scope

The Indian Coast Guard is limited to Indian coastal waters. The Indian Navy, on the other hand, operates in the Persian Gulf, the Somali Peninsula and the Straits of Malacca, primarily. It also gets deployed to the South and East China Seas and the Mediterranean Sea. The Navy trains and maintains personnel, equipment for combat in the event of wars and to maintain freedom in international waters.

## 3. Date of Establishment

The Indian Coast Guard was created on February 1, 1977, as an interim body, to patrol the coastal areas and prevent smuggling activities. The maritime agency was then formally established the following year as per the Coast Guard Act. The Indian Navy was established on January 26, 1950, as a naval branch of the Indian Armed Forces.

## 4. Size and strength

The Indian Coast Guard has over 20,000 active personnel, around 160 vessels and about 62 aircraft. The Indian Navy, on the other hand, has more than 67,000 active personnel, about 75,000 reserve personnel. It has about 150 ships and submarines, and 62 aircraft. The Navy also has more than 50 ships and submarines under construction.

## 5. Bases of Operation

The Indian Coast Guard has 42 stations along the coastline of the nation, in the North-East, Eastern, Andaman & Nicobar, and Western and North-Western regions. The Indian Navy has three commands, namely, the Western Naval Command, the Southern Naval Command and the Andaman & Nicobar Naval Command with 67 bases, of which 7 are under construction.

<https://www.news18.com/news/lifestyle/indian-coast-guard-day-2022-difference-between-indian-coast-guard-indian-navy-4716365.html>



Indian Coast Guard. (Image for representation only: Reuters)

# Aircraft carriers for Indian Navy 'unavoidable requirement' to meet any eventuality

*By Sumit Kumar Singh*

New Delhi: Even as India's first Indigenous Aircraft Carrier (IAC) -- an engineering marvel that reflects the technological prowess of a resurgent nation -- completed its third set of sea trials in January this year, several navies around the globe are looking to either acquire these powerful platforms or upgrade their existing carrier aviation capabilities.

Take for example, China, which is set to launch its third aircraft carrier early next year. Commonly referred to as the Type 003 carrier, this 'super carrier' is believed to compare with the US Navy's new Ford-class aircraft carrier.

The much advanced Ford-class aircraft carriers will replace the ageing Nimitz-class carriers in the United States Navy over the next few decades.

Another example is the Royal Navy, which having withdrawn its carrier aviation capabilities after the Strategic Defence and Security Review (SDSR) of 2010, has inducted two modern aircraft carriers along with state-of-the-art aircraft in the last four years.

The first of the Royal Navy's new carriers, HMS Queen Elizabeth, recently returned from a seven-month long deployment, having travelled half way across the globe to the Indo-Pacific showcasing a 'Global Britain'.

The United States Navy, whose maritime power hinges on its carrier fleet, continues to deploy three to four powerful Carrier Strike Groups (CSGs) across the globe, even as there has been a call from some quarters to enhance their presence in the Pacific.

Meanwhile, both France and Italy -- whose navies have also traditionally deployed aircraft carriers -- continue to upgrade and update their carrier aviation capabilities.

There are many other aspirants to the exclusive club of navies which operate aircraft carriers. Japan, which abandoned its formidable aircraft carrier capability after the Second World War, is now planning to convert its Izumo class helicopter carrying ships into aircraft carriers.

In October last year, the first fixed-wing operation from JS Izumo was demonstrated using the F-35B Lightning fighter aircraft of the United States Marine Corps. By 2025, the Japanese Maritime Self Defence Force (JMSDF) might well be operating two such top-of-the-line aircraft carriers.

South Korea is likely to follow suit as the Republic of Korea (ROK) Navy has already announced its plans to procure an aircraft carrier. Notably, this month, the National Assembly of South Korea approved the new budget for the 2022 fiscal, including funding for the aircraft carrier programme.

Turkey also reportedly plans to convert an amphibious ship, presently under construction, into a platform that will operate long range combat drones -- a capability similar to aircraft carriers.

In this backdrop of rapid developments in carrier aviation across the globe, it is unsurprising that the Standing Committee on Defence (Seventeenth Lok Sabha) in its Twenty Fourth report presented to the Parliament last month, has observed that a force level of three aircraft carriers for the Indian Navy is an "unavoidable requirement to meet any eventualities".

Given the evidently uncertain and unpredictable nature of challenges to India's maritime security, the parliamentary standing committee has only reaffirmed what the Navy's top brass, professionals in the field and security experts have been pointing out - that aircraft carriers are inalienable from India's maritime security.

There is good reason and sound rationale for the Committee's observations. For one, the Committee has itself noted that India's vast coastline, expansive maritime zones and distant island territories require at least one operational carrier on each seaboard.

The Committee has thus envisaged a "standard scenario" in which two aircraft carriers are deployed at all times "while one would undergo repairs and maintenance". Secondly, aircraft carriers can project the nation's military might far beyond its shores thus offering the first line of defence against any threat at or from the sea.

It is in this context that it is useful to look at the versatile and flexible role of aircraft carriers, not necessarily tied down to geographical domains, as alluded by many.

Therefore, although it makes sense to rationalise the required numbers of carriers for the Indian Navy in a particular manner, it must be remembered that these potent machines can be surged forward to any location to counter a threat to India's security.

It is also obvious that there is no fixity in the number of aircraft carriers that a country needs for its maritime security - it would always depend on the type and degree of threat as well as the prevailing external and internal security scenarios.

In the case of aircraft carriers, specifically, the sophistication of the embarked air wing is the true determinant of capability instead of mere number of platforms. This, in turn, implies that the Indian Navy must not only look at future aircraft carriers but also the numbers and type of aircraft that these ships will likely field.

These should include a combination of specialised types of aircraft for air battle, surveillance, electronic warfare and mid-air refuelling, to name a few.

Consequently, there are bound to be extensive deliberations - even debate - on the size and type of the next aircraft carrier as well as its aviation component.

Regardless of what shape India's future aircraft carrier takes, its need has been acknowledged at the highest level of public accountability. The Ministry of Defence must now implement measures to take forward the recommendations of the Standing Committee.

The experience of the first indigenous aircraft carrier shows that these ships take a long time to build. The fast-changing geopolitical environment in our extended neighbourhood, coupled with the tilting military balance in the Indian Ocean Region renders further delay unaffordable.

<https://www.daijiworld.com/news/newsDisplay?newsID=921352>

## Business Standard

Tue, 01 Feb 2022

### **Bharat Dynamics hits new high, stock up 27% in 3 weeks ahead of Budget**

***BDL has been working in collaboration with DRDO & foreign Original Equipment Manufacturers (OEMs) for manufacture and supply of various missiles and allied equipment to Indian Armed Forces.***

Mumbai: Shares of Bharat Dynamics (BDL) hit a new high of Rs 507.80, on rallying 5 per cent on the BSE in Monday's intra-day trade ahead of Budget. The stock of state-owned defence company has rallied 27 per cent in the past three weeks, as compared to 4 per cent decline in the S&P BSE Sensex.

At 09:48 am; BDL traded 3 per cent higher at Rs 501, as against a 1.4 per cent gain in the benchmark index. A combined 232,000 equity shares changed hands at the counter on the NSE and BSE.

BDL, an Anti Tank Guided Missile (ATGM) company, has



forayed into the field of underwater weapon systems and air-to-air missiles and associated equipment. It is the sole supplier of SAMs, Torpedoes and ATGMs in India. It is the lead integrator for Akash weapon system for Army. BDL has also designed and developed Counter Measure Dispensing System (CMDS) for the Indian Armed Forces (IAF).

As on December 1, 2021, BDL order book position stood at Rs 9,293 crore and key new orders in pipeline worth of Rs 15,000 crore, the company said. On December 2, the company and Indian Army signed a contract worth Rs 471.41 crore for Refurbishment of IGLA - 1M missiles.

BDL is a perfect proxy to PSU theme ahead of Budget. The stock has generated multi-year breakout on the back of rising volume, indicating start of a new bull phase. Thus, it offers fresh entry opportunity to ride next leg of secular up move, ICICI Securities said in budget top picks.

BDL has been working in collaboration with DRDO & foreign Original Equipment Manufacturers (OEMs) for manufacture and supply of various missiles and allied equipment to Indian Armed Forces. The company has significant opportunity in expanding its order-book to Rs 23,000-25,000 crore over the next two to three years, the brokerage firm said.

In FY21 BDL did revenue of Rs 1,914 crore with same run rate. There is revenue visibility of ~four years. Order-book accretion is highly visible, as platforms already approved by DAC include SAM (Akash) and ATGM (Astra) Also, BDL is manufacturer of Agni V (ballistic and nuclear) in India, ICICI Securities said with 'Buy' rating on the stock with target price of Rs 548.

[https://www.business-standard.com/article/markets/bharat-dynamics-hits-new-high-stock-up-27-in-3-weeks-ahead-of-budget-122013100254\\_1.html](https://www.business-standard.com/article/markets/bharat-dynamics-hits-new-high-stock-up-27-in-3-weeks-ahead-of-budget-122013100254_1.html)

## Science & Technology News



Press Information Bureau  
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Ministry of Science & Technology

Mon, 31 Jan 2021 8:00PM

### Indian scientists develop efficient and durable solar cells by tuning the length and porosity of nanorods

Indian Scientists have devised a new process for increasing the efficiency and stability of Titanium dioxide ( $\text{TiO}_2$ ) nanorods based on Perovskite Solar Cells (PSC). It will help develop solar cells with stable light-harvesting active layer.

Perovskite solar cells have become commercially attractive because of the potential of achieving even higher efficiencies and very low production costs. However, the challenge lies in its short- and long-term stability.

Scientists led by Dr. V. Ganapathy from International Advanced Research Centre for Powder Metallurgy and New Materials, an autonomous institute of the Department of Science & Technology (DST), Government of India, have increased the efficiency and stability of Titanium dioxide ( $\text{TiO}_2$ ) nanorods based Perovskite Solar Cells (PSC) by varying the length and porosity of the  $\text{TiO}_2$ -Nanorods. They did this by establishing a correlation between the lengths of the  $\text{TiO}_2$ -NR and the porosity of the electrode for the ambient processed PSCs.

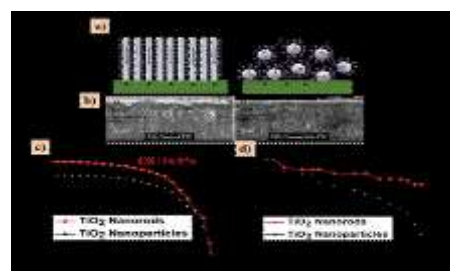


Figure 1. (a) Schematic diagram representing electron transport in  $\text{TiO}_2$  nanorods Vs. nanoparticle, (b) Cross-sectional FE-SEM images of PSC devices composed of  $\text{TiO}_2$ -NR and  $\text{TiO}_2$ -NP electrode, (c) Current-voltage spectrum of the two different photoelectrodes, and (d) Stability comparison of  $\text{TiO}_2$ -NR and  $\text{TiO}_2$ -NP based PSCs aged under ambient conditions ( $25^\circ\text{C}$ , 40 ~ 60% RH).

The team explains that porosity of the electrode plays a vital role in perovskite infiltration and sensitization. The inter-pore distance between the two TiO<sub>2</sub> nanorods determines the photo-electrode's porosity, and the porosity varies as the growth of the nanorod length increases.

“In this work, we had precise control over the length, porosity, and morphology of the TiO<sub>2</sub>-NR from compact film to nanostructured film.”

The team controlled nanostructures of the TiO<sub>2</sub>-NR by varying the concentration of the titania precursor and the growth time. The power conversion efficiency for nanorod-based PSCs was enhanced with variation in the length and porosity of the TiO<sub>2</sub>-NR. The interspacing between the TiO<sub>2</sub>-NR facilitated deep infiltration of the perovskite during the spin coating and is locally confined to the surface of the TiO<sub>2</sub>-NR. Due to the large pores present in the TiO<sub>2</sub>-NR photoelectrode, infiltration of small molecular HTM was also enhanced. The present work was published in the *‘Journal of Alloys and Compounds’*,

The PSCs prepared with 350nm TiO<sub>2</sub>-NR exhibited better efficiency when compared with the conventional NP-TiO<sub>2</sub>. The similar thickness of NP-TiO<sub>2</sub> based device exhibited less photocurrent value than NR-TiO<sub>2</sub>, which was attributed to the dense packing of 20nm TiO<sub>2</sub> particles inhibiting the loading of perovskite. The high crystallinity of the TiO<sub>2</sub>-NR provided a low resistance to the flow of electrons in the Electron transport layer (ETL). In the current work, apart from high efficiency, the crystalline structure of ETL also significantly influenced the stability of PSCs. “The decomposition of perovskite absorber is a critical factor behind the performance degradation of PSCs. Given the similar nature of perovskite, enhanced stability of TiO<sub>2</sub>-NR PSC is attributed to slow ion migration across thermodynamically stable rutile TiO<sub>2</sub>-NR/MAPbI<sub>3</sub> interface,” added Dr. V. Ganapathy.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1793888>



