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PRIME MINISTER NARENDRA MODI TO INAUGURATE THE SHOW TODAY



FOCUS ON EXPORT AND GLOBAL CO-OPERATIONS

"The government can be an effective catalyst for private and public sector in defence." —Defence Minister Nirmala Sitharaman



DEFENCE MINISTER NIRMALA SITHARAMAN SPEAKING AT THE PRESS CONFERENCE ON THE OPENING DAY OF DEFEXPO 2018

By **ROHIT SRIVASTAVA**

One day before the formal inauguration of Defexpo 2018, India's premiere defence exhibition, by Prime Minister Narendra Modi, Defence Minister Nirmala Sitharaman with an eye on the export said that a larger objective will be served by focusing on defence industry.

Calling India a strong, growing and futuristic economy which is sustaining itself, Sitharaman said that it is not only a government's compulsion to support defence production but also to achieve larger objectives. She was speaking on the first day of Defexpo 2018.

"Making India a hub for defence industries and making sure that the defence production is not just for our consumption but also to aim on export. So, India today is able to talk bilaterally to many countries," she said.

She added that India understands that shifting defence production to India and transfer of technology is not one sided dream but it is an actual reality which is taking shape.

Talking to the reporters, the minister and senior officers of the ministry, informed that during the three days of the event many business to business interactions are planned, which will lead to joint ventures and collaborations between Indian and foreign players. DRDO is also expected to announce transfer of technology agreements with Indian firms. Responding to questions on Strategic Partnership, the officials said that first step in implementation of the policy has been taken.

During the interaction, officials informed that in coming month, work on the Uttar Pradesh defence corridor will gain momentum.

Speaking on the lack of funds, the minister said that the utilisation of funds by the three services last year has improved and they are utilising almost whole of the budget allotted to them.

Without disclosing the outcome of her recent Russia trip, Sitharaman said that the visit was fruitful.

Speaking on the Indo-US defence partnership, the minister said, "We wish to engage with the United States as much as the ambassador (US Ambassador) has said."

Kenneth I. Juster, US Ambassador to India, while speaking at the event had said that this region is going through lot of change and the partnership between the two countries is giving strong signal to the region and beyond.

"I am looking forward to the 2+2 (with US)...We look forward to having that engagement. I think a lot more traction will be gained post 2+2," the minister added. Speaking further Sitharaman said that India looks forward to US inputs to take the defence industry further.

With a tag line of 'India the emerging defence manufacturing hub', the 10th edition of Defexpo showcases India's defence manufacturing capabilities.

India which is now the world's biggest arms importer is showcasing its indigenous products like, Arjun Mk-II – an upgrade of Main Battle Tank Arjun, Akash surface-to-air missile, DRDO's under development Advanced Towed Artillery Gun, HAL's ALH Dhruv and other sophisticated equipment.

United Kingdom, one of India oldest defence partner, seizing the opportunity to increase its foot print in Indian defence market at Defexpo, will focus on creating a genuine 'two-way street' of defence equipment collaboration, investment and technology transfer.

Guto Bebb, UK Minister for Defence Procurement, is leading the UK delegation accompanied by the British High Commissioner to India. The Minister will be accompanied by some 20 UK companies who are keen to forge mutually beneficial industrial partnerships and joint ventures with Indian companies.

"The UK and India have much to offer one another in defence: including research, development, collaboration and training. We want to work in partnership with India to build on our shared mutual knowledge, security and prosperity," Guto Bebb said in a statement.

Chennai, the host city, is one of the five nodal cities of Tamil Nadu Defence Corridor. It aims to create synergy between all defence industry players in the region and make it a defence production powerhouse. •

IAI is making the right noises

By **ARPITA KALA**

Arms manufacturers Israel Aerospace Industries (IAI) are all set to move on from the past and into the future, literally. India recently lifted the "restricted procurements" designation from the company making it easier for them to obtain future contracts in the country.

KA-CHING!

In spite of being on the restricted list until recently that made business procurement a tad more complex, IAI has successfully scored many deals in India and is also participating in the ongoing Defexpo 2018.

Last year, IAI struck a deal worth \$2 billion to supply Indian army and navy with missile defense systems as well as a \$630 million deal for the sale of Barak 8 surface-to-air missile systems to Bharat Electronics Ltd.

The company is all set to focus on 'Make In India' during their India visit. According to their statement, they sell to 'focus on solutions tailored for Indian's specific needs, such as: remotely piloted aerial systems, special mission aircraft, state-of-the-art radars, air defense systems and military robotics solutions.' IAI has so far cooperated closely with all branches of the Indian armed forces as well as with all DRDO labs and Indian companies (public and private) in a bid to support the government's policy towards 'Make in India'.

INTO THE FUTURE

However, it's their recent announcement of manufacturing an all-electric aircraft that is grabbing headlines, close on the heels of the innovations by Airbus and Eviation. The Israeli aviation company is reportedly planning to develop an electric airplane, who's first prototype is planned to take to the skies in three years. Though, the details are scarce, the aircraft is touted to have a range of around 900 km with a maximum take-off weight of between 4,350 and 6,800 kg. The electric plane is also reported to have similar dimensions as the Beechcraft King Air 350.

The aerospace company also seems to amping up the drone game too. They recently inked a \$1.1 billion deal with the German ministry of defence to lease unmanned aerial vehicles (UAV). Under the program, the five Heron-PT UAVs made by IAI will be stationed in Israel under the management of the military wing of Airbus. The UAVs are reportedly designated for intelligence missions and are also likely to be used to attack ground targets, including targeted killings at a later stage.

The UAVs are due to become available to the German army starting at the end of 2019. •

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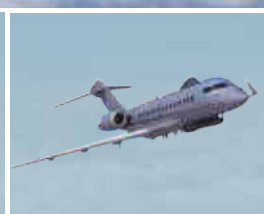
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 **IAI ELTA**
Creating a Difference

Will HAL emerge as helicopter major?

Government-owned Hindustan Aeronautics Limited (HAL), with number of helicopter development projects, is showing achieving commendable design and development capability in the area of military choppers

By **ROHIT SRIVASTAVA**

On January 3, Prime Minister Narendra Modi laid the foundation stone for the Hindustan Aeronautics Limited's (HAL) upcoming helicopter's facility at Tumkur in Karnataka. Speaking on the occasion, Modi said, "I want companies such as HAL to help the country reduce dependency on overseas suppliers." HAL is expected to manufacture 600 helicopters in next 15 years.

"It is no ordinary facility as the world's attention would be focused on it. I expect the indigenous helicopter under 'Make in India', to fly-out by 2018. Nearly 4,000 families, direct or indirect will benefit from this largest ever investment of ₹5,000 crore in Tumakuru", he said.

"I believe that HAL has good manpower and technical knowhow to fulfill the future needs", he added.

Presently, HAL is working on 3-tonne class new generation light utility helicopter (LUH) to cater to both civil and military transportation requirements. Under development since 2009, LUH equipped with glass cockpit, powered by Ardiden 1U/Shakti 1U single turbo shaft engine, will fly at 220 kmph, with a service ceiling of 6.5 km and a range of 350 km with 400 kg payload. It can also be deployed for reconnaissance and surveillance. It will replace Cheetah and Chetak helicopters operational with Indian armed forces. After its maiden technical flight in September, 2016, the chopper had its maiden flight on May 22, 2017, which lasted for about 22 minutes. LUH will be manufactured, tested and overhauled at the



(TOP) ALH DHURUV;
(ABOVE) LIGHT COMBAT HELICOPTER.

upcoming Tumkur helicopter facility.

To replace its obsolete Cheetah and Chetak operational with Indian Forces, till LUH is ready, India will manufacture 200 Russian Ka-226T helicopters. An intergovernmental agreement was signed between the two countries in 2015. The project will be executed through a joint venture between HAL (50.5 per cent) and Russian Helicopters.

In September last year, HAL bagged contract for supply of 41 advanced light helicopters (ALH) Dhruv to the Indian Armed forces. The ₹6,100 crore contract is in addition to the March order for 32 Dhruv for Indian Navy and Indian Coast Guard. HAL designed and developed Dhruv is a multi-role helicopter in the 5.5-tonne weight class. More than 200 helicopters have been produced so far. The Armed version of the Dhruv, named Rudra, equipped with turreted gun, rockets, air-to-air missiles for infantry support and anti-armour role.

Based on the Dhruv, Light Combat Helicopter (LCH), armed with turreted gun, rockets, air-to-air missiles, on January 31, carried out the first flight with its home-made Automatic Flight Control System (AFCS). In December last year, HAL received a Request for Proposal (RFP) for 15 Limited Series LCH.

With orders for under development and under production choppers, HAL is rapidly making strides in giving India self-reliance in the area of light helicopter segment. If things continue to move in the same speed, HAL may emerge as an Asian helicopter major. •



Focus on indigenous product development

SP's ShowNews in conversation with **Colonel H.S. Shankar (Retd)**, Chairman & Managing Director, Alpha Design Technologies Pvt Ltd

SP's ShowNews (SP's): With the defence manufacturing industry witnessing a huge growth, what prospects does Alpha Design see in the market? Also, could you talk about your order book position?

Col H.S. Shankar (Shankar): We expect our own sales turnover both for national and international markets (Exports) to go up twice to thrice in next two years and stabilise around ₹1,000 crore in next three years. We have a healthy order book for next five years for ₹1,500.00 crore with 50 per cent from exports.

SP's: Recently you have announced the plans to sell shares of the company to public as part of widening the business. Could you elaborate more on the expansion activities?

Shankar: We have not made any formal announcement yet, but we are working towards IPO by end this year.

SP's: The government is pushing for indigenisation in defence and call for strategic partnerships with private players. How does Alpha Design take advantage of this?

Shankar: We already have a strong R&D with more than 475 young engineers (all in the age group of 21 to 28 years) and technicians working on advance technology products/projects such as software define radio, missile RF seekers, IFF, microwave electronic warfare sub-units, optronics products, etc. We already have strong relationship on R&D and proto development with DRDO/PSUs/private sector units as also from abroad. This will add in newer indigenous products development and securing orders/contracts both in India and abroad.

SP's: How do you look at Defexpo 2018 as a platform to showcase the Alpha Design's capabilities? What are the highlights of your Company at this year's Expo?

Shankar: We are very enthusiastic in show casing our products at Defexpo. We have, probably, biggest pavilion (Hall '1' Stand No. 1.1.7 and 1.2.8), about 990 sqm size. We are show casing solutions for tank/ICV upgrades in thermal imager fire control systems for T-T2/BMP-2, electronic warfare and new cockpit suite for Mi-17 helicopters, software defined radios, etc., in addition to a separate enclosure for space projects. •



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Empowering the Nation's Defence Forces

Can India afford to 'chill-out' about China?

With a trade corridor that flouts India's sovereignty in full swing and wounds of Doklam still fresh, former Army Chief General V.P. Malik and former Chief of the Air Staff Air Chief Marshal Fali Homi Major interpret the Sino advances on Indo turf

By **ARPITA KALA**

The recent violation of Indian airspace by China isn't a first nor does it seem to be the last. A 73-day military face off at Doklam last year at the behest of Bhutan that involved soldiers from the two sides throwing punches and stones at each other, and the frequent appearances of Chinese attack submarines in the Indian Ocean has got the nation on its tenterhooks.

With the recent military budget allocation being the lowest since 1962 (also the year of Sino-Indian war, an ominous date indeed), many are concerned if we can afford to 'chill-out' about China?

HOPE SPRINGS ETERNAL

"No, we can't afford to 'chill out' but we shouldn't put China on a pedestal. It's not 12 ft tall and I think given the capabilities of our armed forces coupled with good diplomacy, China doesn't seem to a problem to me," says former Air Chief Marshal Fali Homi Major. And he isn't alone either. Serving Chief of Army Staff General Bipin Rawat has also recently stated that the Indian Army can maintain preparedness and its active operational activities within the budget that has been allocated for the armed forces.

On that note, the annual India-China military exercise will also resume this year after being shelved due to tensions last year. India is also being extra cautious to appease the dragon vis-à-vis Tibet. Recently senior government officials were instructed not to attend the "Thank You India" event organised by the Tibetan government-in-exile marking 60 years of political asylum in India. Reportedly, the Tibetan spiritual and religious leader, His Holiness Dalai Lama also cancelled an upcoming visit to the Indian border state of Sikkim — a region that China claims is part of Tibet, lest it offended China. While many officials maintain that Indo-Tibet relationship is 'very little political but more spiritual, religious and cultural', the Prime Minister's upcoming China visit may be the reason behind the move.

"These are just nuances of diplomacy. Like I know that the Prime Minister is supposed to go to SCO summit, then our defence minister and even foreign minister will be visiting China. So, there are a number of events coming up in the next few months where there will be exchanges at a very senior level and probably that's the reason why the Ministry of External Affairs (MEA) doesn't want to create a situation which can fizzle out the major changes that can take place. I wouldn't like to pass any judgment but if the Ministry of External Affairs has passed these instructions, it must be for a valid reason," reasons General Ved Prakash Malik, who also served as Army Chief during the Kargil War.

CROUCHING TIGER, NOT-SO-HIDDEN DRAGON

However, China's advances cannot be taken lightly either. Former Army Chief General Ved Prakash Malik agrees. He says, "China has started asserting itself militarily on all its fronts whether it is South China Sea or unresolved Indo-Tibet and Indo-China borders. What's worrisome is that whatever they think belongs to them, they are becoming more and more assertive about it. They may not want to start a war at these places but inching forward is what we have seen along our borders. So, with their ag-

gressive patrolling, trying to inch forward, we have to be really alert around the borders."

Not only militarily, but economically too China is making no bones about irking India. Its ambitious Belt and Road Initiative (BRI) that seeks to rebuild the China's old Silk Road trade routes bypasses India, apart from a corner of the disputed Pakistan occupied Kashmir (PoK) region but involves the neighbouring Sri Lanka, Nepal and the Maldives, with the exception of Bhutan. India's bone of contention is not as much the cold shoulder from the initiative but the fact that it passes through the PoK and even boycotted last year's Belt and Road Forum organised by China. The MEA also issued a statement on its objections on mainly three grounds—the corridor includes projects in lands belonging to India, the initiative risks running smaller countries into huge debts and could destroy the ecology as well as disrupt local communities.

However, in spite of apprehensions, government attendees at the upcoming SCO meet are expected to tactically refrain from opposing BRI as well as the China-Pakistan Economic Corridor (CPEC).

BUDGET TROUBLE

Despite General Bipin Rawat's reassurances, the fact remains that the defence budget is inadequate to counter hostile neighbouring countries. Minister of State for Defence Subhash Bhamre also mentioned the same in a written reply that the current budgetary allocation was around ₹76,765 crore less than what the forces sought.

General V.P. Malik says, "Any serving army chief has to say things like this. Even during Kargil war when we had lots of deficiencies, I had also said that we will fight with what we have. So, you cannot wrong him (General Rawat) on that. The fact is that today we know that there are a large number of deficiencies and our modernisation has been lacking. These indications were given by Vice Chief Lt General Sarath Chand...even minister Subhash Bhamre has spoken about the same in a letter. The point is that we are weak today on two major issues—the infrastructure, particularly around the northern borders and secondly, deficiencies and lack of modernisation. Both these things require money and therefore a large number of us feel that the budget is inadequate."

According to General Malik, the budget may hit the government's ambitious 'Make in India' project too with the lack of capital not attracting enough companies. He also suggests that the army, navy and air force also amp up their savings to be used for modernisation. He says, "I am definitely not asking for a war or any sort of war mongering but if the situation is likely to escalate, we need to be prepared for it. When we are looking to 'Make in India', the private or any other sector wants to see how much capital do we have. If we don't have that what kind of orders can they expect from the Ministry of Defence? So, it is essential, I believe to give them more money as well as save money within the Armed Forces, all three forces, to the extent that it's possible. And, that saving should also go into the modernisation kitty, not anywhere else." •



"I am definitely not asking for a war or any sort of war mongering but if the situation is likely to escalate, we need to be prepared for it," says former Army Chief General V.P. Malik



"We shouldn't put China on a pedestal. It's not 12 ft tall and I think given the capabilities of our armed forces coupled with good diplomacy, China doesn't seem to a problem to me," says former CAS Air Chief Marshal Fali Homi Major



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The Hindustan Turboprop Trainer-40 (HTT-40) is an initiative under "Make in India" by HAL with an internal funding support. The indigenous content on HTT-40 is close to 80% and almost 50% of the components on HTT-40 are manufactured by private players of the Indian aerospace ecosystem.

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Coming – Chinese robot tanks

India should prepare for conflict that would likely combine robotics and AI; UGVs, drone swarms, quantum communications, cyber attacks and more

By **LT GENERAL P.C. KATOCH (RETD)**

In October 2017, media reports confirmed the government seven-point strategy as prelude to India's strategic plan for using AI (artificial intelligence), covering issues like developing methods for human machine interactions, ensuring security of AI systems, creating competent workforce matching AI and R&D needs, addressing ethical, legal and societal implications of AI, measuring and evaluating AI technologies through standards and benchmarks, and the like. An experts committee has also been set up in the Ministry of Electronics and IT to advise the government on a policy for AI, government's main focus is to reduce cyber attacks with AI. The main central policy is to be drawn once the experts committee submits its report.

Machine intelligence-powered platforms sure can become a strategic instrument of governance in India across a wide range of public services, from NATGRID to Aadhaar but the defence sector needs much more focus. DRDO's Centre for Artificial Intelligence & Robotics (CAIR) has developed a range of robots with varied applications, and is also developing: man portable unmanned ground vehicle (UGV) for low intensity conflicts and surveillance in urban scenario; wall climbing and flapping wing robot; walking robot with four and six legs for logistics support; Network Traffic Analysis (NETRA) which can monitor internet traffic.

But considering the pace at which developments are taking place, particularly in China in combining robotics and AI, our slow progress in this field is liable to leave us at huge asymmetric disadvantage. News about cooperation with Japan on AI is good but looking at the abysmal FDI in the defence sector, the prospects don't look good.

CCTV (China's TV channel) recently showed video footage of a Type 59 based tank being controlled by a soldier sitting in front of a computer terminal with a steering wheel. According to Russian sources, quoting Chinese media Sohu, the footage was made in the 'Unmanned Battle Systems Lab of PLA'. China's Type 59 is based on the Soviet T-54A tank, bought from Russia in 1950s, and the unmanned version may be armed with a 100mm or 105mm cannon. For present, this may just be a demonstrative model but with integration of remote target acquisition and remote fire control technologies, this would become cutting edge military weapon platform. Given the pace of Chinese R&D, such development would not be too distant. Sohu also reported that unmanned warships, drones and battle vehicles programs are also under development.

In 2017, China's State Council issued an ambitious policy blueprint calling for the nation to become "the world's primary AI innovation center" by 2030, by which time, it forecast, the country's AI industry could be worth \$150 billion. China is investing heavily in all aspects of information technology, from quantum computing to chip design. Multiple initiatives have been launched including China building \$2.1 billion AI technology park in Beijing's western suburbs. Compare this with America's total spending on unclassified AI programs in 2016 of \$1.2 billion.

Nations are seeking to harness AI advances for surveillance and censorship, and for military purposes. According to Elsa Kania, fellow at the Center for a New American Security in Washington, DC notes in her recent study on China's military AI investments, that in fields of AI in China the boundaries between civilian and military research and development tend to become blurred, adding, "The PLA may leverage AI in unique and perhaps unexpected ways, likely less constrained by the legal and ethical concerns prominent in US thinking. China's military is funding the development of new AI-driven capabilities in battlefield decision-making and autonomous weaponry."

In 2014, PLA Major General Xi Hang, heading PLA's Academy of Armoured Forces Engineering had said, "Unmanned ground vehicles will play a very important role in future ground combat. Realizing that, we have begun to explore how to refit our armoured vehicles into unmanned ones." Robotic systems coupled with AI will be live threats on the battlefield sooner than we can think. Not only will China deploy such systems along the Line of Actual Control with India, there is every possibility of these moving into PoK and Pakistan as PLA deployment grows in the region. In addition, select technologies will be passed on to Pakistan and other strategic partners.



Gorden G Chang, author of 'The Coming Collapse of China', in his article 'The World Should Take China's War Threats Seriously' published in National Interest on March 23, 2018 writes that armed with second term, Xi Jinping is now full of fire and fury, and that when he promised "full unification of the motherland" to the National People's Congress on March 20, that is code for annexation of Taiwan, large portions of India, dozens of Japanese islands, a speck of South Korea, Philippine rocks and reefs, and almost all the waters of the South China Sea. Obviously, Gordon doesn't imply this happening overnight but in sharp contrast the mood in India appears to be that conflict is not on the cards at all because of the downturn of Chinese economy and Sino-Indian trade relations. China has excellent trade relations with Taiwan and China also but gives no credence to economic relations when it comes to territorial claims – however illegal. It is for good reason that China has enhanced deployments and communications in Tibet opposite India, consolidation the 'string of pearls' and invested in sub-conventional war on India. Any conflict, however small, would impact Indian economy adversely. We need to seriously prepare for conflict that would likely see use of robotics and AI.

Prudence demands that India should prepares for conflict that would likely combine robotics and AI; unmanned ground vehicles, drone swarms, quantum communications, cyber attacks and more. •

The views expressed herein are the personal views of the author.







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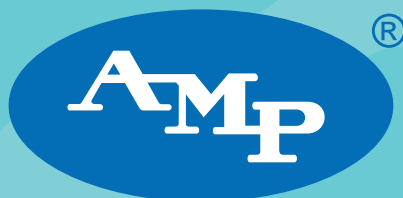
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Slow but not steady

Indian government must streamline defence procurement process and should ensure that all legacy equipments are replaced well before they become obsolete



By **ROHIT SRIVASTAVA**

Indian military acquisition is a sorry tale of delays. Indian Navy, better of the three services, has been at the forefront of indigenisation and acquisition of vessels and equipment. In spite of this, there are many crucial programmes which can't be delayed further. Many of these programmes are in the request for information (RFI) stage. Some of them have gone through the complete tendering process and the programmes were later cancelled. Some of them are going through the tendering process again. This has to end. This time it is imperative for the government to take the tender process to its logical conclusion. Some of the most important programmes are detailed below.

INS VISHAL

India is planning a follow-up carrier vessel to the under-construction aircraft carrier (ACC) INS Vikrant. Although, the project is yet to get the nod from the authorities and it is expected to be called INS Vishal. Navy is working on the specifications of the carrier.

The conventionally powered vessel is expected to weigh around 65,000 tonnes. According to reports, Navy is exploring the possibility of having Electromagnetic Aircraft Launch System (EMAL) to launch aircraft from Vishal. As of now, Indian carriers use ski-jump to launch aircraft. The carrier is still at the planning stage and if approved, the project will take not less than a decade to come up.

India's under-construction ACC INS Vikrant is still at least two years away from joining the naval fleet. The slow speed of carrier acquisition is jeopardizing India's three carrier plan to dominate the Indian Ocean Region where one carrier each would man the eastern and western shores and one carrier will be docked for refit.

The lone operational carrier INS Vikramaditya joined Navy on November 16, 2013, after a delay of over five years and a cost escalation of \$800 million. For a period of four years, till the decommissioning of INS Viraat in 2017, India had two operational carriers.

P-75(I)

It is the follow-up programme of the ongoing Project-75 under which India is building six conventionally powered French Scorpene submarines. In

this project, six more conventionally powered submarines with land-attack cruise missiles, air-independent propulsion for significant longer underwater endurance, will be built in India by an Indian shipyard, through the strategic partnership model of defence procurement procedure. This project is open to private shipyards also.

The RFI for the project was sent to six firms' including French Naval Group, Russia's Rubin Design Bureau, Germany's ThyssenKrupp Marine Systems, Sweden's Saab group, Spain's Navantia and Japan's Mitsubishi-Kawasaki Heavy Industries. The last two firms did not respond to the RFI. The ₹60,000 crore project is expected to see engineering giant Larsen and Toubro and Reliance Defence and Engineering Limited (RDEL) competing with public sector shipyard Mazagon Dock Limited (MDL).

- 2010 - AoN and RFI; No RFP issued
- 2014 - Fresh clearance from DAC
- 2017 - new RFI

LANDING PATROL DOCK

In 2011, India sent out a Request for Information (RFI) to procure Landing Platform Dock (LPD) class of ships for the Indian Navy under Buy and Make (Indian) category. As per the RFI, out of four ships, procured from the foreign shipyard, two were to be built at public sector Hindustan Shipyard and rest by private Indian shipyard. Later, the first tender was cancelled and a Defence Acquisition Council (DAC), apex procurement body of the Ministry of Defence (MoD), last year, approved the project with an amendment to procure the LPDs from the Indian private shipyards. The shipyard will form a joint venture with a foreign shipyard and file joint proposal and the selected ship will be constructed in India.

There are two contenders for the contract Reliance Defence and Engineering Limited (RDEL) and Larsen & Toubro (L&T). The project is expected to cost over ₹20,000 crore to exchequers and will provide Indian Navy with much required amphibious capability for beach assault and humanitarian relief operations. For the project, L&T has joined hand with Navantia whereas RDEL has collaborated with Naval Group. Interestingly, India has been fiddling with this idea of LPD for a decade, in the meantime, Australia and Egypt have been able to procure them and Turkey is executing them.

- 2011 - RFI released, later cancelled
- 2017 - amended RFI released



Make in **INDIA**
Make in **ALPHA**

**ALPHA DESIGN
TECHNOLOGIES**



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Stall No. 1.1.7 and 1.2.8**



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MULTI-ROLE HELICOPTERS

Indian Navy is looking for the replacement of its legacy shipborne choppers for modern helicopters which can execute anti-submarine, anti-surface warfare, electronic intelligence, troop movement, special operations and commando roles. The requirement is for 123 Naval Multi-Role Helicopters (NMRH). India is currently operating Sea King in anti-submarine roles.

The RFI for the requirement was sent out last year. The procurement will be made through the Strategic Partnership Model. The probable main contenders for the project are Lockheed Martin's MH-60R and Eurocopter's EC 725 Caracal.

- 2017 – RFI issued
- 2011- RFP for 16 MRH later cancelled

FIGHTERS FOR CARRIER

India is currently operating Russian MiG-29K fighter jets from its lone aircraft carrier. India bought 45 of these aircraft to operate from INS Vikramaditya. Marred by repeated engine failure, the availability percentage of Mig-29K is one of the lowest of all aircraft in Indian inventory.

India had planned to induct homemade Light Combat Aircraft (Navy) for its under construction INS Vikrant. But the aircraft failed to stand up to the naval staff requirements and Navy was compelled to look out.

In January last year, Indian Navy sent out an RFI for 57 Multi-Role Carrier Borne Fighters (MRCBF). The request for proposal for the project is expected anytime this year. The main contenders for the tender are French Dassault's Rafale M, Boeing's F/A-18 Super Hornet, Swedish Saab's Sea Gripen and Russian MiG-29K.

- 2017 – RFI released
- 2018 – RFP expected

NAVAL UTILITY HELICOPTERS

In August last year, Indian Navy sent out a RFI for 111 Naval Utility Helicopters.

Indian military acquisition is a sorry tale of delays. Indian Navy, better of the three services, has been at the forefront of indigenisation and acquisition of vessels and equipment. In spite of this, there are many crucial programmes which can't be delayed further.

These choppers will replace the decades' old Chetaks (Allouette III) which are reaching their airframe life. The procurement will be carried out under Strategic Partnership model. The deal is expected to cost the exchequer around ₹21,738 crore (\$3.2 billion). These choppers will operate from frontline warships and Offshore Patrol Vessels and will also operate from shore for search and rescue operations.

Probable contenders for this requirement are Lockheed Martin's S-75, Airbus AS565 Panther, and Bell 429 GlobalRanger.

- 2010 – RFI
- 2012 – RFP
- 2014 – RFP cancelled
- 2017- Fresh RFI

AMPHIBIOUS AIRCRAFT

Indian Navy's requirement of Amphibious Aircraft is yet to be fulfilled. Indian Navy issued the RFI for amphibious aircraft in 2011. ShinMaywa industries ltd, Japan responded to the RFI by offering its US-2 amphibian aircraft. An Indo-Japan joint working group was set up in 2013 to discuss the possibility of sale of US-2 through Government to Government route however the group was subsequently disbanded and MoD has been discussing the case since then.

Strategic alliances between two countries depends hugely on sale/purchase of military equipment.

In spite of Japan offering concessional rates and sops in form of free training etc, the \$1.6 billion deal is not moving forward at a pace it should. The decline in defence budget has further weakened its case. Apart from being a force multiplier for Indian Navy the deal was to help Indian Aerospace manufacturing sector as well. But with the delay the very purpose is getting defeated.

- 2011 – RFI
- 2013 - Two countries start talks •



Creative and Contemporary



RM's/ MoD award for best Performing MoD Shipyard for FY 15-16 conferred on 30th May 2017



06 CG OPV Project

With all deliveries within a short gap of 2 years, the most successful project in Indian Shipbuilding Industry



SCOPE Award Financial Turnaround, awarded by Hon'ble President on 11th April 2017



MAJOR IMPORT SUBSTITUTE PRODUCTS

ADVANCED MISSILE FRIGATES 1135.6 (KRIWAK CLASS)



Value of Production

VoP x2 in 3 yrs, x3 in 4 yrs

Highest ever VoP in History of GSL - Rs 1361 Cr in FY 17-18



Profit Before Tax

PBT x2 in 4 years

Achieved PBT of Rs 300 Cr for FY 17-18, highest in history of GSL



Highest ever exports of Rs 400 Cr in FY 16-17, 40% of VoP from exports



MAJOR IMPORT SUBSTITUTE PRODUCTS

MINE COUNTER MEASURE VESSEL

Only shipyard to deliver every ship/project ahead of Schedule in last 4 years

Gross tonnage of 12000 Tonnes delivered in year 2017, highest amongst Indian shipyards

2017-18 deliveries - 3 OPVs to Coast Guard, 2 OPV to Sri Lanka, 1 FPV to Mauritius, 2 1000T Fuel Barges & 1 DCTF to Indian Navy

Emergenced L1 for Largest Boat order of 160 Boats for Ministry of Home Affairs

Likely to record highest ever operating profit of Rs 235 Cr for FY 17-18, a jump of 6 times in last 4 years

Awarded 'Excellent' MoU grading with 100% score for FY16-17, highest score by any DPSU in last 10 years

GOA SHIPYARD LIMITED

(Best Performing MoD Shipyard with fastest cumulative growth in last 4 years)

Contact : cmd@goashipyard.com fpg_office@goashipyard.com



DRDO – spearheading indigenisation

Defence Research and Development Organisation (DRDO) was created to make India self-reliant in defence. Since establishment, its story has been a checkered one. Off late, DRDO has been making its mark with the success of the ongoing trials of the under development 155mm/52 calibre Advanced Towed Artillery Gun (ATGM) which is in partnership with Bharat Forge and Tata Power SED.

On February 25, DRDO successfully flew its Rustom 2, a medium altitude long-endurance (MALE) unmanned aerial vehicle (UAV), at its Aeronautical Test Range (ATR) at Chalakere at Chitradurga. This was the first flight in user configuration with higher power engine. With an endurance of 24 hours, the drone will carry out surveillance and reconnaissance (ISR) roles for the armed forces. The payload of the UAV will include synthetic aperture radar, electronic intelligence systems and situational awareness payloads.

Three days later, much awaited anti-tank guided missiles (ATGM) NAG



SUCCESSFUL FLIGHT TRIAL OF RUSTOM II

was successfully test fired in desert conditions against two tank targets at different ranges and timings. With this, DRDO declared completion of the developmental trials of the missile and “it is now ready for induction.” This is was the follow up of tests conducted in September last year. Working towards making India self reliant in missiles, DRDO in recent times has achieved many a success.

In November, 2017, India's first indigenously designed and developed long-range sub-sonic cruise missile Nirbhaya was successfully test fired from the Integrated Test Range (ITR), Chandipur, Odisha. “The missile has the capability to loiter and cruise at 0.7 Mach, at altitudes as low as 100 metres. The missile majestically cruised for total time duration of 50 minutes, achieving the range

of 647 km,” a statement informed.

DRDO has also been able to extend the range of its Pinaka multi-barrel rockets and convert them into a precision strike weapons. •

BEL to showcase its might at Defexpo 2018

BEL is participating in the biennial Land, Naval and Internal Homeland Security Systems Exhibition Defexpo 2018, which is scheduled from April 11 to 14, 2018, at Thiruvaidanthai, Thiruporur Taluk, Kancheepuram, East Coast Road, Chennai.

Navratna defence public sector undertaking Bharat Electronics Limited (BEL) will showcase its capabilities spanning every domain of its business – radar and fire control systems, network-centric systems, C4I systems, communication systems, missile systems, electronic warfare and avionics, anti-submarine warfare systems, naval systems, electro optics and laser systems, gun upgrades, tank electronics, home land security systems, technology modules, simulators, shelters and civilian products. BEL will display its R&D capabilities by demonstrating some of its new products/technologies through launching of 11 products. The theme for this year's display is ‘Make in India.’

BEL will display a host of new radars – 3D C/D band air surveillance radar (3D ASR), weapon locating radar, active electronically scanned array – battle field surveillance radar (AESA-BFSR), ground penetrating radar, through wall radar, 3D low level light weight radar, surface surveillance radar and secondary radar (Identification of Friend or Foe Interrogator-IFFI MK XII).

The network-centric systems on display include trusted network solution-demo, combat management system, C4I technology-demo, air defence control & reporting system and coastal surveillance system.

Communication systems/elements on display will include the software defined radio (SDR) airborne – live demo, SDR Manpack, Combat Net Radio Mk II, mine field recording system, handheld satcom terminals, IP modem and IP encryptor, satcom on the move, secure smart phone, carbon fibre antenna, secure military wireless LAN, 100 Mbps radio, advanced VLF receiver/modulator, Beacon-Mk III and ULSB MK-III. Also on display will be the helmet mounted display system and integrated fire detection and suppression system.

Missile System on display will be Akash weapon system.

Electronic Warfare & Airborne products on display will include modern electronic warfare system (VARUNA), manpack jammer, radar finger printing system (RFPS), avionics for light combat aircraft (LCA) – digital flight control computer (DFCC), air data computer (ADC), pylon interface box – inboard, out-



(TOP) WEAPON LOCATING RADAR;
(ABOVE) UPGRADED SCHILKA WEAPON SYSTEM.



board, laser (PIB-IB, OB, Laser), stores interface box (SIB), function sensor display unit (FSDU), multi-function rotary switch (MFR), multi-function keyboard (MFK), engine fuel indicator (EFI), Get-U-Home (GUH); multi spectral warning system (MSWS), radar warning receiver (RWR) and Rustom unmanned aerial vehicle (UAV) LRUs – airborne integrated payload processing unit (AIPPU), ground integrated payload processing unit (GIPPU), airborne spread spectrum modem (ASSM), ground spread spectrum modem (GSSM) and COMPASS (compact multi-purpose advanced stabilised surveillance system).

Anti-submarine warfare systems on display includes advanced composite communication system (ACCS) for naval platform, USHUS-2, HUMSA NG, hull mounted Sonar-X, IAC MoD-C, SONAR DOME, Advanced Torpedo Defence System (ATDS)-Maareech and transducers.

Also on display will be the complete range of electro optics, laser, tank electronics and gun upgrade systems – hand held thermal imager (HHTI) with laser range finder (LRF), long-range surveillance system-Prahari, passive night sight for INSAS Rifle/LMG and for rocket launcher, passive night vision binocular, goggle and monocular, thermal imager sight for assault rifle (uncooled), multi-purpose reflex weapon sight, laser warning system, laser dazzler, laser range finder – air defence higher

repetition, light weight portable laser target designator (LWPLTD), EOFCS: 5PPS, electronic fuses for mortars, artillery guns and rockets, NBCRV model, L-70 gun upgrade and remote control weapon system (RCWS).

Technology modules like MEMS pressure transducers, CTD Sensors, Quad T/R modules, pulsed power amplifiers, block-up converters, digital receivers and signal processors will be on display.

Other Systems on display include border management system, command & control for homeland applications, new generation shelters and masts, electronic voting machine (EVM), X-Ray baggage inspection system, chemical agent monitor (e-nasika), point of sale, tablet PC and batteries. Various simulators will also be showcased.

The highlight of BEL's outdoor display will be the 3D C/D band air surveillance radar (3D ASR), weapon locating radar (WLR), upgraded Schilka weapon system, L-70 gun upgrade, SATCOM on the Move (SoTM) and gun shot detection system. •



GSL – Gearing up for future maritime security requirements

Established unique benchmark in Indian shipbuilding industry with delivery of 23 ships in the last four years, all ahead of schedule, amounting to gross tonnage of 32,000 tonnes, highest in the industry. The throughput achieved with three times increase in VoP and four-and-a-half times increase in profit in four years validates the processes and productivity which has been consistently increasing year on year. **SP's ShowNews** in conversation with **Rear Admiral Shekhar Mital (Retd)**, Chairman and Managing Director, Goa Shipyard Ltd.



SRI LANKA NAVY SHIP ADVANCED OPV SAYURALA



INDIAN NAVY OPV INS SUMITRA

SP's ShowNews (SP's): GSL has shown sharp improvements in the financial results year on year over last four years coupled with consistent delivery of 100 per cent projects ahead of schedule. How has the company manage to achieve these superlative results in such a short span of time?

Rear Admiral Shekhar Mital (Retd) (Mital): The Company has experienced exponential growth in the last few years with VoP jumping three times from ₹500 crore in FY 13-14 to ₹1,400 crore in FY 17-18 and PBT increasing about 4.5 times from ₹(-)63 crore in FY 13-14 to ₹290 crore in FY 17-18. Year after year, the Shipyard has been reporting highest operating profit in the industry. This becomes particularly more impressive when growth of ~30 per cent achieved in the last four years is compared with other shipyards operating under similar ecosystem. We have delivered 23 ships in last four years including 9 OPVs, 2 FPV, 11 FIBs, 2 1,000T fuel Barge and 2 Damage Control Simulator which amounts to 32,000 tonnes of shipbuilding. This is highest in the shipbuilding industry, with the unique distinction of attaining all deliveries prior contractual schedule, the biggest sore point and complaint area in shipbuilding industry.

The Shipyard has recently completed Coast Guard Advanced Offshore Patrol Vessel Project in November 2017. It is a matter of pride that project was completed in five years from 2012-17 with all six vessels delivered ahead of schedule and build period of 2,400 tonne OPVs reduced to 36 months from 67 months taken earlier for last OPVs built by GSL.

The slew of measures undertaken for this turnaround include strategic realignment of priorities, strict cost control measures, stringent monitoring mechanisms, seamless coordination amongst various stake holders, accountability of personnel, on the spot decisions, fast tracked approvals and effective supply chain management. This of course comes only with sound understanding of technical and financial issues required in running shipyard efficiently.

SP's: The Shipyard has established itself as the leading exporter with successful execution of multiple exports projects. Can you tell us something about that?

Mital: Shipyard's share of exports have been increasing year after year and in the last three years alone it has delivered two OPV to Sri Lanka, 11 FIBs and 2 FPVs to Mauritius, and a Damage Control Simulator to Myanmar. The two Sri Lankan OPVs are the biggest warships to be exported from India and largest in the Sri Lankan fleet. Share of exports in VoP in the last financial

year 16-17 was 40 per cent at approximately ₹400 crore and for FY 17-18 and it is likely to be ₹550 crore. With these figures, the Shipyard has emerged as the largest exporter of defence ships from Indian sub-continent and was given Raksha Mantri's award for 'Best performing in export amongst all DPSUs' for FY 14-15.

SP's: Can you give us insight into the future plans of the Shipyard?

Mital: MCMV – Considering the grim shortfall of Mine Counter Measure Vessels (MCMVs) with the Indian Navy, GSL has taken cue from 'Make in India' initiative of Government of India and taken up the challenge of constructing all 12 High technology MCMVs indigenously at GSL. We have to put majority of infrastructure, expertise and planning into place to be able to start construction of the MCMVs by 2019. The requisite infrastructure is nearing completion and Phase 3A was inaugurated by Hon'ble Prime Minister on November 13, 2016, which reflects the importance attached to this Project. Since there are only two technology providers in the world for required niche technology of MCMVs, there were certain commercial issues faced during negotiations. To overcome that EOI has already been reissued seeking transfer of MCMV technology and expect to move forward rapidly. It is to be appreciated that such mega projects involves considerable planning, finalisation of build strategy, positioning of resources before start of Project and I am happy to state that we will be ready to start construction immediately on conclusion of ToT agreement and conclusion of PNC with the government.

Missile Frigates – GSL has been entrusted with construction of Two Advanced Missile Frigates for the Indian Navy under ToT with Russia. The first two ships of the class will be constructed at Russia and the next two will be constructed at GSL under ToT. The PNC for the Project is in advanced stage of conclusion and preparatory activities are in full swing to commence construction by 2020/21.

The Shipyard has taken lot of initiatives for 'Make in India' is always on the lookout to get most advanced and niche shipbuilding technology to India through collaboration/ToT. You will shortly be hearing a lot from us regarding our initiatives towards indigenisation and 'Make in India' to bridge the technology gap.

With excellent track record of deliveries and build Quality, the Shipyard is determined to continue its exponential growth and provide quality indigenous solutions to our maritime security agencies. •

Astra Microwave Products Ltd (AMPL)

– Leader in strategic electronics in India

Astra Microwave Products Pvt (AMPL) Ltd, a public listed company based at Hyderabad, India, has been spearheading the design, development and manufacturing of RF and microwave components, super components, systems and related technologies to space and defence sectors.

Over the years, Astra Microwave Products Ltd, has risen to the demands of the strategic electronics market with a capacity to rapidly absorb new technological breakthrough with a strong and committed in-house R&D team. This has in turn enhanced the capability to deal with a growing market with ever changing technological requirements.

The major capabilities and contributions to the state of the art Active Phased Array Radar systems to the defence and space segments has been in the Development and Automated mass manufacturing of antenna arrays, transmit-receive modules, exciters-receivers, etc.

Sensing the need of Fabless Semiconductor Design Centre, along with backend processing of the wafers for Monolithic Microwave Integrated Circuits (MMIC), AMPL has established the comprehensive facility and has been able to turn out a chain of MMIC components indigenously. An export wing of the company Aelius Semiconductors Pte. Ltd (Aelius) has started functioning from Singapore.

Astra Microwave has already been manufacturing sub-systems for many foreign organisations under the offset programme. Starting work with Built to Print basis, Astra has also been given some opportunities to products on built to specifications. As they have already been delivering high end modules in high quantity meeting the quality and delivery benchmarks and this combined with their strong presence in the Indian market, makes the company ideally poised to go on further and become a strong player in the Make and Buy and Make Indian category of defense procurements.

AMPL has posed itself as the design and/or manufacturing partner for

foreign OEM's looking to make their products in India and supplying to the swiftly increasing demands of defense forces in India for modern equipment's. With offsets taking a backseat in the Policy domain of the Government of India and the present Government policy of 'Make in India', many of the future defense procurements are expected to move in this direction. The Hyderabad-based firm is therefore well placed in positioning itself as a partner for manufacturing strategic electronics for major foreign OEM's that are eyeing the high capital spending of the Indian armed forces. Moving on in this direction, AMPL has formed a JV company along with Rafael, Israel for the communication products and has been registered as the Astra Rafael Communications Ltd. (ARC), Hyderabad.

AMPL has expanded its operations to Bengaluru and has also set up an office in Delhi to work on the futuristic requirements of the Indian Ministry of Defence (MoD), eyeing opportunities to produce smaller defense systems in collaboration with foreign equipment manufacturers. The company has invested heavily into infrastructure and has been supporting the Defense Research Development Organisation (DRDO), Indian Space Research Organisation (ISRO) and the defense public sector units for strategic electronics that form part of radar systems, electronic warfare systems, telemetry systems and satellite systems. Having worked in various programs of Indian defence, supplying strategic electronics in the form of sub-systems and components, the company is already working in the high technology domain.

The company believes that with their technological ability on the sub-system level combined with the expertise of foreign OEM's, they can support the requirements of the Indian armed forces under the 'Make in India' programme. It is only logical then, that Astra Microwave poses themselves as an ideal partner to Foreign OEM's for 'Making their products In India.' •

Automatic transmissions powering defence vehicles at Defexpo 2018

It takes more than just quality and professionalism to be a trusted brand for the nation's defence forces, and Allison Transmission knows that. A global leader in transmission design and manufacturing for defence vehicles, the company will showcase wheeled and tracked transmissions at their booth in Hall No.5 at the ongoing Defexpo 2018.

WHAT SETS THEM APART

Design, development and production of Allison cross drive transmissions for tracked vehicles began in the 1940s. Since then, for over 60 years, Allison-equipped defence vehicles, both tracked and wheeled have delivered faster acceleration, superior traction and greater maneuverability as compared to its counterparts. This success was followed by the introduction of Allison's commercial duty fully automatic transmission in wheeled vehicles for defence applications.

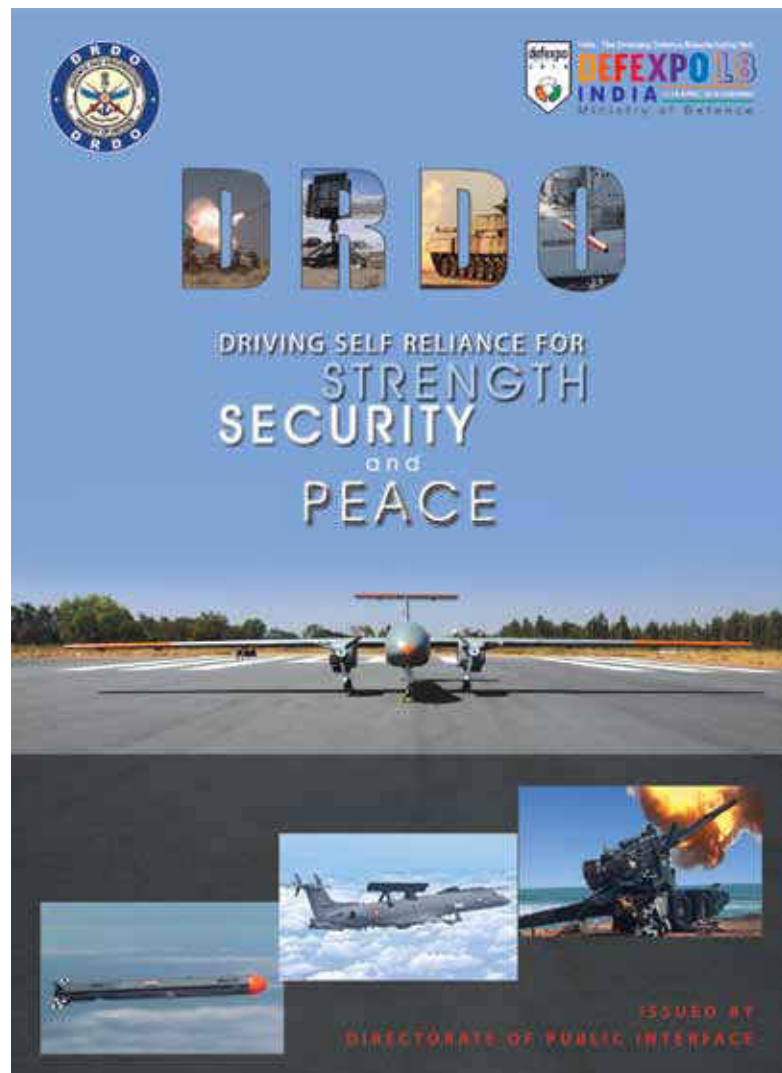
In fact, their patented torque converter nearly doubles engine torque at vehicle launch ensuring a superior quick start. And, without a traditional dry clutch, vehicles equipped with this transmission do not experience clutch-related failures and the associated vehicles downtime, saving time and money.

Allison transmissions feature advanced fifth-generation electronic controls, which automatically monitor vehicle systems and adapt shift schedules to deliver efficient operation over challenging terrain. An optional integral retarder to complement and enhance vehicle braking systems and a Power Take-Off (PTO) provision are also available on most models.

MAKE IN INDIA MOVE

Allison already has a manufacturing facility in Chennai producing transmissions for wheeled vehicles since 2010. As the Asia manufacturing facility, Allison Chennai plant will continue to play an important role as part of Allison global footprint. The Chennai plant currently produces Allison 1000/2000 series transmission for its global customers. •

—Arpita Kala





ShinMaywa manufactures the world's largest in service proven amphibian with matchless STOL capabilities, unrivalled sea keeping ability and outstanding endurance. Meeting Indian Requirements, Fulfilling Regional Aspirations and Matching Global Expectations for "Safe Seas and Secure Coasts" the US-2i is India's best option for a brighter tomorrow.

Unique. Ahead of the Art.

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