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INDIAN TRICOLOUR AT DEFEXPO 2018



OPERATIONAL DEMONSTRATION BY INDIAN NAVY  
ON DAY 1



DEFEXPO 2018 DEMONSTRATIONS IN  
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NAVAL MIGHT ON DISPLAY



ENTHRALLED SPECTATORS WATCHING THE LIVE  
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SPPublications

## BIG DAY @ DEFEXPO 2018

India will establish strategically independent defence industry:  
Prime Minister Narendra Modi



PRIME MINISTER NARENDRA MODI DELIVERING HIS ADDRESS AT THE INAUGURATION CEREMONY OF THE DEFEXPO INDIA-2018

By **ROHIT SRIVASTAVA**

Inauguration of the Defexpo 2018 by the Prime Minister Narendra Modi reinforced the Indian Government's commitment to make India self reliant in defence manufacturing. Prime Minister Modi, on the second day, formally inaugurated the show in the presence of the Governor of Tamil Nadu Banwarilal Purohit, Chief Minister K. Palaniswami and Defence Minister Nirmala Sitharaman.

While delivering his inaugural speech, Modi convincingly articulated his government's plan to ease out woes of Indian and global defence industry. "Our commitment to peace is just as strong as our commitment to protecting our people and our territory. For this we are ready to take all necessary measures to equip our armed forces, including through the establishment of a strategically independent defence industrial complex."

Speaking on the delays in the defence procurement, Prime Minister criticised the policy paralysis during the previous central regime. "There was a time when the critical issue of defence preparedness was hampered by policy paralysis. We have seen the damage such laziness, incompetence or perhaps some hidden motives, can cause to the nation. Not now, Not anymore, Never again," he added.

Referring to the recent finalisation of the bullet proof jacket, he said, "You would have seen how the issue of providing bullet proof jackets to Indian sol-

diers was kept hanging for years. You would have also seen that we have brought the process to a successful conclusion with a contract that will provide a boost to defence manufacturing in India."

Discussing the policy initiatives in the defence sector the Prime Minister said, "We are conscious that defence manufacturing is unique in terms of government involvement. You need the government to grant a license to manufacture. Since the government is almost the only buyer, you need the govt. to grant an order. You need the government even to grant permission to export."

"Over the last few years, we have made a humble beginning. On defence manufacturing licenses, on defence offsets, on defence exports clearances, on foreign direct investment in defence manufacturing, and on reforming our defence procurement, we have taken many steps," he added.

Connecting the historical legacy of the venue with India's East Asian geo-strategic 'Act East' policy, he said, "This is the land from where India Looked East and Acted East thousands of years ago."

Noting the uniqueness and distortion of the defence industry where government is the sole buyer, Modi said, "We are conscious that defence manufacturing is unique in terms of government involvement."

Industry needs government to give license to manufacture to even export.

"In May 2014, the total number of defence export permission granted stood at 118, for a total value of



PRIME MINISTER NARENDRA MODI LAUNCHING THE IDEX (INNOVATIONS FOR DEFENCE EXCELLENCE) SCHEME AT THE INAUGURATION CEREMONY OF DEFEXPO 2018

\$577 million. In less than four years, we have issued 794 more export permissions, for a total value of over \$1.3 billion," he added.

Earlier, the CM Palaniswami said that state government wants the industry to utilise Tamil Nadu's large industrial base and large number of highly skilled manpower. He also said that his government will make Chennai a maintenance repair and overhaul (MRO) hub for aviation which forms a big part of defence industry.

Tamil Nadu is working to establish a 300 acre defence and aerospace industrial park at Sriperumbudur which can be later expanded to 500 acres.

During the inauguration Modi also launched the Innovations for Defence Excellence (IDEX) which will support young men and women to come up with innovative solutions for Indian defence requirements.

The inauguration was watched live by audiences in 35 locations abroad. Arrangements were made in Indian Embassies in Finland, Germany, Netherlands, South Korea, Japan, Australia, Turkey, etc. •

#### PUBLISHER AND EDITOR-IN-CHIEF

Jayant Baranwal

#### DEPUTY MANAGING EDITOR

Neetu Dhulia

#### SENIOR CONTRIBUTORS

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#### PRINCIPAL CORRESPONDENT

Rohit Srivastava

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#### PLANNING & BUSINESS DEVELOPMENT

Executive Vice President: Rohit Goel

#### SALES & MARKETING

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#### LAYOUT DESIGNERS

Vimlesh Kumar Yadav, Sonu Singh Bisht  
 Research Asst-Graphics: Survi Massey

#### ADMIN & COORDINATION

Bharti Sharma

#### ASST-ADMIN, HR & INFRA

Pooja Tehlani

#### SP'S WEBSITES

Sr Web Developer: Shailendra Prakash Ashish  
 Web Developer: Ugrashen Vishwakarma

#### SP GUIDE PUBLICATIONS PVT LTD

A-133, Arjun Nagar,  
 (Opposite Defence Colony)  
 New Delhi 110003, India

Tel: +91 (11) 24644693, 24644763, 24620130  
 Fax: +91 (11) 24647093

E-mail: info@spguidepublications.com

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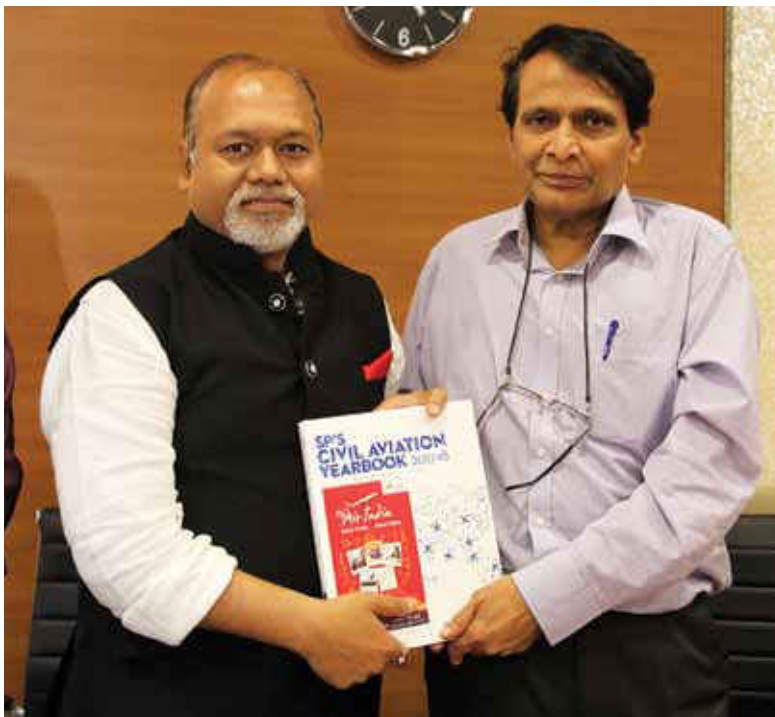
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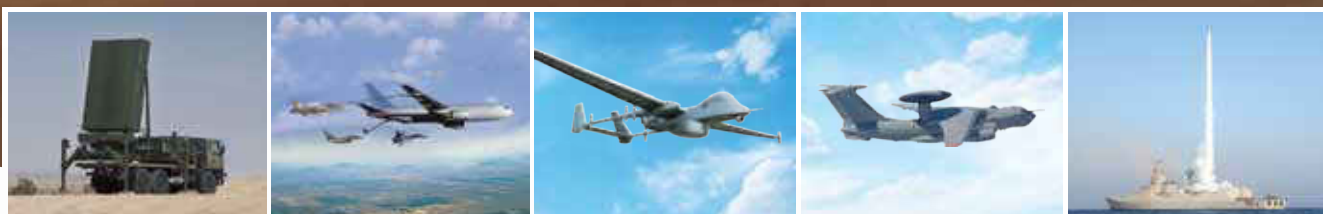


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# Boeing Defence – Committed to India

By **ROHIT SRIVASTAVA**

**G**lobal defence and aerospace major Boeing is looking forward to strengthen its presence in India. Employing over 1,600 people and contributing with over 7,000 employments, through its partner firms to Indian economy, Boeing is annually sourcing from India is worth one billion dollars. In a press briefing, during the show, Michael Koch, Vice President, Boeing Defense Space and Security, India, informed that their company has developed a vendor base of 160 suppliers.

Deepening the relationship with the larger industrial-technical ecosystem in India, Boeing is developing academic and research relationship with premier Indian institutions like Indian Institute of Technology (IIT). As of now, it has formed 12 research and development partnerships and academic partnerships with five IITs.

Boeing Defence India (BDI), a local operating entity, to drive the company's future growth objectives in the country will focus on responsiveness to customer needs and grow indigenous engineering, sourcing, manufacturing and lifecycle management capabilities.

With BDI, Boeing will expand its engagement with India to deliver advanced capability and readiness to its military customers and to develop a competitive supplier base in country that is integrated into company's global supply chain.

The company's sole manufacturing joint venture with Tata group was formed in 2015 with the purpose of working together on aerospace products. The work on the facility began in 2016 and was inaugurated on March 1. The Hyderabad based facility will be the sole producers of fuselages for the global Apache attack helicopters fleet. The deliveries will begin in 2018.

Discussing the 22 AH-64E Apache and 15 CH-47F Chinook helicopters pro-



**MICHAEL KOCH, VICE PRESIDENT,  
BOEING DEFENSE, SPACE & SECURITY  
IN INDIA**

gramme for India, the company said that the deliveries will begin in 2019. It was also informed that the Boeing has signed Letter of Acceptance for the 11th C-17 Globemasters for India. Boeing has already delivered 10 C-17s to India.

In addition, Boeing has to deliver four more P-8I maritime reconnaissance and strike aircrafts. India, which operates eight of these birds, is the international launch customer of the aircraft.

Having established a foothold in Indian market, Boeing is now participating in competitive tenders for 110 fighters for Indian Air Force (IAF) and 57 carrier based fighters for Indian Navy. The company is offering its twin engine F/A-18 Super Hornet through 'Make in India'. IAF tender is through the Strategic Partnership model which requires an Indian partner for the original equipment manufacturer.

Boeing is also participating in the IAF's mid-air refuelling tanker programme with its KC-46A Tanker.

Company through its industrial partners like Tata, HAL, SASMOS and BEL, is sourcing key components of the F/A-18 Super Hornet, Apache, Chinook and P-8I. Through its fleet support programmes, Boeing is providing 85 per cent and higher mission readiness rates in India. It is also providing training to Indian crew of its C-17 and P-8I aircraft.

In 2017, Boeing signed a three-year contract to substantially bolster Boeing's performance-based support to the Indian Navy and increase the operational capability of the P-8I fleet.

For the Indian Navy and Army's unmanned aerial system requirement, Boeing is offering its Integrator drones. With around 61 kg of maximum take-off weight the drone has an endurance of 24 hours and can loiter at a maximum height of around 6,000 metres. •

## L&T built OPV commissioned



**L**arsen and Toubro built offshore patrol vessel (OPV) ICGS Vikram was commissioned into the Indian Coast Guard on April 11, 2018. The commissioning was done in the presence of Minister of State for Defence Dr Subhash Bhamre, at L&T's Defence shipyard at Kattupalli, near Chennai. Rajendra Singh, Director General of Indian Coast Guard, Rajan Bargartra, Commander Coast Guard Region (East), S.N. Subrahmanyam, CEO & MD, Larsen & Toubro, J.D. Patil, whole-time Director (Defence) and Member of L&T Board, Vice Admiral B. Kannan (Retd), MD & CEO L&T Shipbuilding and other dignitaries graced the occasion.

The vessel is the 'First of Class' of seven new generation OPVs contracted by Ministry of Defence (MoD) to L&T in March 2015, under government's initiative of 'Make in India'. The OPV project has scored many firsts in India's nearly six decades of Defence shipbuilding history. The entire design and construction of OPVs has been carried out in-house by a private sector shipyard – L&T Shipyard. The vessel, is approximately 97 metres long, 15 metres wide, has 3.6 metres draught, 2,140 tonne displacement and a range of 5,000 NM.

Construction of follow-on OPVs is progressing ahead of schedule at Kattupalli shipyard. OPV-2 has been launched and is being readied for harbour and sea trials. L&T is also undertaking various refits and repairs of Naval and Coast Guard vessels. •

—SP's Correspondent

## India Pavilion - Displaying Indian prowess

**T**he ongoing Defexpo, which boasts of many firsts, has a unique pavilion which brings together Indian defence products from both private and public sector. The pavilion displays some of the biggest achievements of Indian defence industry. Keeping in line with the expo's theme 'India: The Emerging Defence Manufacturing Hub' the pavilion intends to exhibit Indian defence products to the world.

The first thing that catches the eye, after entering the pavilion, is the towering Advanced Towed Artillery Gun (ATAG) developed by the DRDO in association with Tata and Bharat Forge. It also displays DRDO developed precision rocket version of Pinaka rocket system and indigenously developed heavy torpedo 'Varunastra'.

On the aircraft side, the pavilion has miniatures of various Indian developed aircraft and choppers including Light Combat Aircraft Tejas, Airborne Early Warning and Control aircraft, Advanced Light Helicopter Dhruv and license manufactured aircraft like Su-30 MKI.

The pavilion gives substantial space to products developed by Indian private sector ranging from complete system to components. Engineering major Larsen and Toubro and Bharat Forge secure the largest spaces with their artillery products. L&T has its K-9 Vajra-T self-propelled artillery system, which will very soon become part of the Indian army's stable, prominently displayed in the pavilion. Bharat Forge, leading engineering firm of India, has its ultra light truck-mounted 155mm/39 calibre gun showcased in the pavilion. •

—Rohit Srivastava





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# Military's manpower shortages

There is no doubt that the gap between personnel retiring and recruitment continues to persist but why that cannot be narrowed down is also questionable



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

**R**esponding to questions by two Members of Parliament (MPs), Defence Minister Nirmala Sitharaman recently informed Parliament that the Armed Forces had a total shortage of approximately 60,000 personnel excluding those belonging to the medical and dental streams. Of these approximate 60,000 manpower shortages (58,602 to be exact), the Army topped the list with 27,864 personnel, followed by Navy with 16,235 (24 per cent deficiency of overall authorised manpower of 67,228), and Air Force 15,503 (10 per cent of overall authorised strength). The real worry for the Army is shortage of officers, which as per figures of May 2017 was shortage of 7,679 against the authorised figure of 49,932; shortage amounting to 15.38 per cent. The manpower deficiency also should be viewed in the backdrop of low medical category (LMC) personnel in the military, Army having the largest share, who can only perform limited duties. Defence Minister also told Parliament in January 2018 that 48,500 Armed Forces personnel have been granted premature retirement during the last four years since 2014. These included 47,499 from Army, 465 from Navy and 553 from the Air Force.

There is no doubt that the gap between personnel retiring and recruitment continues to persist but why that cannot be narrowed down is also questionable because the retirement years of those serving can be predicted to large extent even if it depends on promotions. However, in a country where unemployment is a major problem, why should there be large manpower deficiencies, in officers as well as personnel? This needs serious thought despite suggestions like compulsory military service for those aspiring government jobs – which is impractical. Incidentally, when Admiral Vishnu Bhagwat, then CNS, visited South Korea in 1997, his liaison officer was a young naval officer from London School of Economics who had come home midway to do his compulsory military service before returning to London to complete his studies.

The Defence Minister told Parliament 48,500 Armed Forces personnel were granted premature retirement over last four years, these were not the only ones who 'sought' premature retirement. With 47,499 in Army, it may be assumed number seeking premature retirement would be around 60,000 to 65,000, if not more. These shortages would have multiple reasons like better avenues, preference for easy life with more money, family problems and the like, which are constant past decades. But a major issue is disillusionment because of government apathy towards soldiers – spoken in hushed tones, not acknowledged.

The military is called out for any conceivable job. The Army has become the first respondent in crowd control, Jat Agitation in Haryana or whatever,

despite Haryana having four police officers of DGP rank and eight DGPs drawing pay equivalent to Army Commander/Corps Commander respectively. But take the recent Shopian incident in Jammu and Kashmir (J&K) where hundreds of stone-pelters attacked an army convoy, attempted lynching a JCO after critically injuring him, burnt and damaged army vehicles, and the CM of the State shamelessly directs police to file an FIR against the Army, including an Army major who wasn't on the scene. Any FIRs filed against the police when forced to open fire? Was FIR filed against police that opened fire and killed 38 Dera Sacha Sauda followers at Panchkula in August 2017? Which country in the world, other than India, pays its military less pay and allowances compared to the police and para-military? Which country gives less pension to military pensioners compared to civilian defence pensioners (45 per cent of defence pension budget in India is consumed by just 22 per cent civilian defence pensioners)? Which country would give Non-Functional Upgradation (NFU) Allowance to all government employees but deny same to its Armed Forces? What do you make of: military veterans wearing medals and regimental caps peacefully protesting for grant of full OROP baton-charged by police – wards of some of them serving in military watching the spectacle on social media; Defence Minister stating that litigation against war-wounded, disabled and widow pensions will not be withdrawn; civilian structures permitted closer and closer to military establishments despite mounting terror threats – recently attacked Sunjwan Army Camp in Jammu being just one example where adjacent civilian structures provide observation over entire garrison.

On top of all this, the military and individual soldier is grossly under-equipped. Government admits inadequate budget allocations but says military can re-prioritise – akin to telling a beggar to decide whether he wants to get his torn shirt patched up or his torn trouser. There are repeated calls to cut down manpower citing China but do the powers-that-be realise how China has modernised and technologically empowered PLA while India has done the reverse? Additionally, with his commitment to manage the nation, the Prime Minister surely cannot have the time to keep tweeting himself but his twitter handler ensures police and CAPF casualties are condoled forthwith, but silence to military casualties. To soldiers it is direct message government priority lies. Disillusionment also prevails because after 1971, the nation has never united behind its military – not even during IPKF deployment in Sri Lanka or Kargil Conflict. Not without reason a former Army Chief says Army is no more preferred choice for youth. •

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

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The Light Utility Helicopter (LUH) is the third indigenous helicopter product from the stables of HAL after ALH and LCH. The helicopter is designed to carry out various utility roles such as reconnaissance, transport, cargo load and rescue operations. The helicopter can operate from sea level to high altitudes of Himalayas.



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# ATAG, Dhanush and K9 VAJRA — the three 'Made in India' howitzer musketeers

India's artillery forces is on track to get a new lease of life

By **ARPITA KALA**

It never rains but it pours — the adage seems to hold true for the Indian Army. Three decades after the Swedish-made Bofors Howitzers and the subsequent controversy, the M777 howitzer kick-started the modernisation of artillery regiments in May 2017 with the delivery of the first two ultra-light howitzers. The two new acquisitions are a part of 145 long-range guns order by BAE Systems that is expected to be completed by June 2021. Not only that, DRDO-designed Dhanush and still-in-works Advanced Towed Artillery Gun System (ATAGS) will soon join the ranks too. Close on heels of the trio are a hundred orders of K9 VAJRA-T 100 self-propelled tracked 155 mm howitzers from Larsen & Toubro (L&T).

India plans to equip 169 regiments with 3,503 of these guns by 2020. However, the army's artillery modernisation plan expects procuring 2,800 guns by 2027 including 1,580 towed guns, 814 truck-mounted guns, 100 tracked self-propelled guns, 180 wheeled self-propelled guns and 145 ultra-light howitzers.

## MAKE IN INDIA: ARTILLERY EDITION

The government's bid to give a fillip to indigenous production is going strong with the artillery upgrade. K9 VAJRA-T 100 will be produced in India by L&T



K9 VAJRA T 155 52 CALIBRE SELF-PROPELLED HOWITZER

in their Talegaon, Maharashtra in collaboration with Hanwha Techwin (HTW). A manufacturing line at Hazira, Gujarat with a test track to produce, test and qualify the guns is also planned. The K9 VAJRA will have 50 per cent indigenous parts and the joint venture will also develop 14 subsystems including fire control and communication suits, hull, and turret structure in India.

The Dhanush is already undergoing user trials and may just get upgraded from to 155 mm/52-calibre to extend the shooting range to 42 km. The latest version of the towed howitzer is currently under development. The howitzer is a weightier option of the ultra-light weight M777 and is more suited for loca-

tions with less challenging logistics. The Ordnance Factories Board (OFB) has also announced the successful 'up gunning' of 130 mm to 155 howitzers in the Nalanda factory unit in Bihar. According to the statement, the upgradation has been done for just ₹1 crore each, a steep decline from ₹15 crore (approximately) cost of a new 155mm artillery gun.

Meanwhile, the ATAG system, also on display at the ongoing Defexpo 2018, is winning all popularity polls since it's India's first fully designed and indigenously developed howitzer artillery gun. After four years of developing and testing the gun has completed all trials and might be inducted in the forces in 2019. Though it remains to be seen if the DRDO manages to score orders from international players for the ATAG at the exhibition. •

## L&T – One stop shop for defence

Unlike Defence public sector, engineering conglomerate Larsen & Toubro is emerging as defence sector leader with products for all spheres of battle

Larsen & Toubro (L&T) is expanding its capabilities in all major domains of defence products, ranging from missiles, artillery and rockets, armoured vehicles, ammunition, naval ships to submarines. In last one year, it has successfully delivered naval ships and signed artillery contracts.

In 2017, company crossed many milestones. On October 27, L&T launched, entirely designed in-house, the lead offshore patrol vessel (OPV) of a series of seven OPVs for the Indian Coast Guard (ICG). This was the first OPV class vessel for the ICG that has been built by a private sector yard. In March 2015, L&T signed a contract with Ministry of Defence for these seven OPVs for an order value of ₹1,432 crore. Again on June 20, company launched ₹468 crore Floating Dock (FDN-2), in-house designed and built, for Indian Navy. The FDN-2 will be delivered at Port Blair. Speaking on the launch, Jayant Patil, Whole-time Director, had said, "It is an affirmation of the in-house capabilities and track record of L&T that we are launching the FDN-2 for the Indian Navy ahead of schedule today."

Besides surface vessels, L&T is one of the main contenders for Indian Navy's Project 75(I) six conventional submarine programme. It is well known that the company has contributed significantly to the Indian nuclear submarine programme.

Similarly, L&T is part of the surface-to-air Akash missile and multi-barrel rocket launching Pinaka system. L&T has joined hand with French missile leader 'to develop and supply missiles and missile systems to meet the growing potential requirements of the Indian armed forces'.

In May 2017, foraying into artillery manufacturing, L&T signed a contract with MoD "for supply of 100 units of 155mm/ 52 calibre Tracked Self-Propelled Gun systems to the Indian Army" for ₹4,500 crore.

In 2011, India came up with 'Buy Global' program for which L&T and South Korean Hanwha Tech Win (HTW) participated with K9 VAJRA-T – an enhanced version of HTW's K9 Thunder, with 50 per cent indigenous content.



L&T intends to deliver all 100 guns in 42 months. This will be so unlike artillery modernisation plan which is decade behind its schedule. •

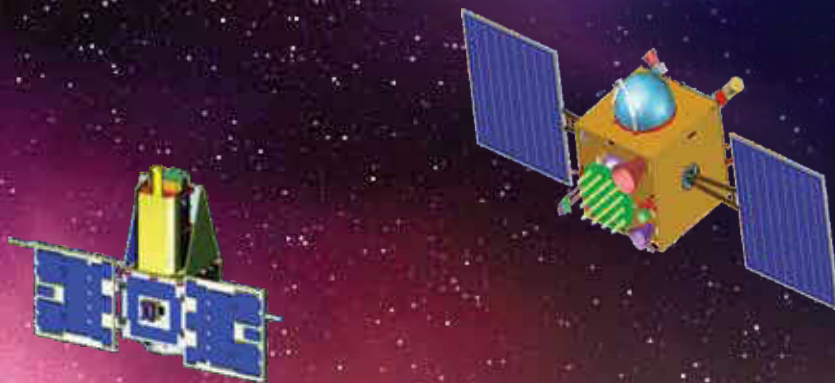
—By Rohit Srivastva





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# Slow but not steady

If India wishes to retain its conventional military superiority against its adversaries in a two front war scenario, then, Indian Air Force will have to be adequately equipped



By **ROHIT SRIVASTAVA**

The Indian Air Force (IAF), one of the leading Air Forces in the world, is struggling to get rid of its near obsolescent aircraft which populate almost half of its fighter squadrons. This has been the situation since almost two decades and things can not be allowed to get worse. The IAF began the search for replacement for its ageing Russian fleet at the turn of the millennium and the only success story since then, has been the signing of a contract for 36 Rafale jets from France. Things in other areas are no better. Some of the major programmes that are lagging years behind are discussed below.

## AVRO REPLACEMENT

It has been seven years since the IAF started looking for an aircraft to replace its fleet of 56 vintage medium-lift turboprop transport aircraft procured initially from the United Kingdom and then built under licence in India. In 2012, the Ministry of Defence (MoD) accorded Acceptance of Necessity (AoN) to the replacement programme through 'Buy & Make' route.

Out of the 56 new aircraft to be acquired, 16 will be received in flyaway condition and 40 will be assembled in India by an Indian Production Agency (IPA) from the private sector. The Original Equipment Manufacturer (OEM) is to select the IPA. In 2013, Request for Proposal (RFP) for the project was issued to eight foreign OEMs. In response to the RFP, only Airbus, in association with the Tata Group, submitted a techno-commercial bid offering its C295 medium-lift transport aircraft and an Independent Committee was constituted to look into various issues related to the single vendor situation.

The project was nearly shelved when the defence public sector opposed the project being given to private sector. It was revived by the NDA government in 2014 and in 2015, the MoD cleared the ₹12,000 crore project. After exhaustive user trials carried during the next two years, the contract negotiation committee began the negotiations with the OEM in 2017.

## TANKER AIRCRAFT

The six Russian IL-78, inducted in 2003-04, fulfills the IAF's mid-air refueling requirements. The first attempt to acquire another six tanker aircraft was made in 2006. The last two attempts failed due to certain reservations related with cost of the aircraft. The Airbus A330 MRTT, IL-78 and Boeing KC-46A Pegasus are the main probable contenders for the requirement. In January this year, the IAF restarted its project for purchase of six mid-air refueling aircraft. After two similar attempts, the third RFI was released for the \$2 billion deal.

## CHEETAH/CHETAK REPLACEMENT

The ageing fleets of Chetak and Cheetah helicopters were to be replaced by

197 light helicopters purchased from international vendors. Of these, 64 were to come to the IAF. The RFP was first floated in 2008 and again in 2009 as the Reconnaissance and Surveillance Helicopter. Eurocopter AS 550 C3 Fennec and Russian Kamov Ka-226 were the final contenders. However, the tender was cancelled and replaced by a government-to-government deal with Russia signed at the end of 2015 for 200 Ka-226T helicopters to be manufactured in India. The Shareholders Agreement for the establishment of a Joint Venture to manufacture Ka-226T helicopters in India was also signed in 2016. The project will be executed through a joint venture between HAL (50.5 per cent) and Russian Helicopters. The JV agreement is expected to be signed sometime this year.

Early in 2017, Prime Minister Narendra Modi laid the foundation stone for a new helicopter manufacturing facility for HAL in Tumakuru, located 70 km North-West of Bangalore in Karnataka as a step in HAL's expansion of its helicopter production capability. However, there are no signs of the project reacting to the critical shortage of Chetak/Cheetah helicopters with the sense of urgency it deserves and it will be years before this facility produces its first Ka-226T. Moreover, there is some apprehension on account of the fact that the Ka-226T has not been tried and tested over prolonged operations in a Siachen-like environment although it did meet the conditions it needed to for qualification for the Indian military.

Out of 200 helicopters, 40 will come from Russia and 60 will be assembled in India. The rest will be manufactured in India.

## MMRCA

In 2007, the IAF came up with a RFP for 126 medium multi-role combat aircraft (MMRCA) which saw enthusiastic participation from some of the world's leading manufacturers of combat aircraft and was called 'mother of all deals'. The RFI for the project was first sent out in 2004 to global OEMs.

In 2016, the IAF initiated a process to acquire around 100 single-engine combat aircraft which saw response from Swedish Saab offering Gripen E and American Lockheed Martin (LM) offering F-16 block 70. But the process which appeared to solve the problem in minimum time with substantial cost saving as both the contenders offered to manufacture the aircraft in India with significant technology transfer, did not go further as the government failed to put aside the demands for including twin-engine fighters in the requirement.

Now, it appears that the things have come back to where they were in 2007. If and when the RFI comes, most probably the contenders will be none other than the MMRCA bidders, barring one or two new entrant such as LM's F-35 and the Russian Su-35; at this point of time (notwithstanding some of the reports and sentiments indicate that India is showing interest in F-35).

## JAGUAR ENGINE

The Anglo-French fleet of the Sepecat Jaguar deep penetration strike aircraft



# RFI for Combat Aircraft for the IAF

After an agonising wait, the Request for Information (RFI), the first step in the tendering process, has finally been initiated in the first week of April this year.



DASSAULT AVIATION'S RAFALE



BOEING F/A-18 SUPER HORNET

By **AIR MARSHAL B.K. PANDEY (RETD)**

**B**y early January 2017, the Ministry of Defence (MoD) headed by the then Minister of Defence Manohar Parrikar, that the government had finalised plans for a global tender to select a single-engine fighter aircraft to be manufactured in India under a transfer of technology arrangement. The requirement projected by the Indian Air Force (IAF) was for 200 single-engine fighter aircraft to arrest the rapid erosion of combat capability of the IAF with the retirement from service of the ageing fleets of combat aircraft of Russian origin. As the years go by, the deficiency in the combat fleet will only increase. It is estimated that by 2025, the IAF will need to induct around 420 aircraft to build up to the authorised level of 42 squadrons. Part of this deficiency will be made up by the induction of 36 Rafale jets and few Tejas light combat aircraft. In the context of the growing confrontation with China, the IAF will certainly need the authorised establishment of combat fleet to go up to around 50 which would translate to a requirement for another 160 platforms.

While the global aerospace industry was looking forward to the commencement of the tendering process, the government added a new twist to the situation. Early this year, the MoD directed the IAF not to restrict the tender to single-engine aircraft, but to include twin-engine platforms as well. This will increase the number of bidders and obviate the possibility of the development of a 'single vendor' situation in the tendering process, which is not acceptable under the Defence Procurement Procedure 2016. In effect, it would be a virtual repeat of the tender for the medium multi-role combat aircraft (MMRCA) which failed after eight years of its initiation, leaving the IAF literally high and dry. The proposal initiated by MoD, Manohar Parrikar,

was seen as pragmatic and a quick-fix solution to the crisis that the IAF was and continues to be confronted with.

After an agonising wait, the Request for Information (RFI), the first step in the tendering process, has finally been initiated in the first week of April this year. The RFI is very comprehensive and covers every aspect of the platform for which information is being sought such as its capabilities, operational and technical parameters, onboard avionics, maintainability and reliability, life cycle support and so on. As the RFI does not specify the requirement for a single or twin-engine aircraft, it would logically cover both.

But what appears somewhat incongruous is the projection of the number of aircraft required which stands at 110. This is not only too low a figure for the IAF, it is also some unattractive to a foreign original equipment manufacturer (OEM) desirous of bidding for the contract. The combat fleet of the IAF is already deficient of 200 aircraft and the projection in the RFI is well short of the requirement even after allowing for 36 Rafale jets and a few Tejas light combat aircraft expected to be delivered by the Hindustan Aeronautics limited. But what is a matter of greater concern for the prospective bidder, is that the requirement of 110 platforms projected would not provide a volume of business that is large enough to justify the very heavy investment required to set up a new production line in India or even to relocate one that is already functional in the country of the bidder. While the OEM finally winning the contract will also scout for opportunities in the global market to support their production line in India, it would prefer to have its business in India to be sustained by the domestic demand.

Hopefully, the Request for Proposal (RFP), the second step in the tendering process, would be structured keeping in mind the requirement of the IAF as also the viability of the business model of OEMs bidding for the contract to produce fighter aircraft in India for the IAF. •

of the IAF is one of its primary strike aircraft in the combat fleet. Out of the fleet of 140 aircraft acquired initially, currently around 125 remain in service. Inducted into the IAF some four decades back, it has undergone multiple upgrades in its avionics and weapons, keeping it relevant in its role for the IAF. However, the most important component of the aircraft, its engine, is yet to be upgraded.

The aircraft, fitted with two Rolls-Royce's Adour Mk 811 turbofan engines, is underpowered and hence to improve its flight envelop which could allow it to operate in high operating environment such as in the mountains, a more powerful engine is required. On November 26, 2010, the MoD issued a Request for Proposal (RFP) to two of the leading engine manufacturers, Rolls-Royce the original power plant provider and to the American engine manufacturer Honeywell for its F125IN engine. In response to the tender, Rolls-Royce initially offered the Adour Mk 821, an upgraded version of the existing engine Adour Mk 811, which delivers higher thrust. However, Rolls-Royce withdrew from the creating a single vendor situation on account of which the RFP was withdrawn in 2011. In the meantime, as the Jaguar spares production lines are closing down,

India is procuring 31 decommissioned Jaguar's from France for spares to keep the existing fleet flying.

## FIFTH-GENERATION FIGHTER AIRCRAFT

India's search for a fifth-generation fighter aircraft (FGFA) began, when an agreement for an Indo-Russian collaboration project to develop the FGFA was signed during the visit of Russian President Vladimir Putin in 2007. It was estimated that the project would need an investment of around \$6 billion with both nations sharing equal amount of work. The project was likely to take 10 years.

In December 2010, the state-owned Hindustan Aeronautics Limited (HAL) and Russian companies Rosoboronexport and Sukhoi signed a memorandum of understanding for the preliminary design work for the aircraft. India was required to invest \$295 million in the programme. The preliminary design work phase was ready by 2013. Things have not moved beyond this. In December 2014, it was for the first time that the IAF appraised the MoD about the inadequacies in the proposed FGFA on account of which it did not consider the platform suitable for induction. Reportedly, IAF is not ready to accept the aircraft. •

# UDAN, gets a military touch

From maritime surveillance and liaison flights, HAL's pet projects may fare well for Regional Connectivity Scheme (RCS) too

By **ARPITA KALA**

**L**ooks like Minister of State for Civil Aviation, Jayant Sinha's target audience for UDAN (*Ude Desh ka Aam Naagrik*), the hawai chappal wearers, may soon get to fly a few miles in DMS boots as the government's Regional Connectivity Scheme (RCS), UDAN, gets a military touch.

## IT'S RAINING UPGRADES

The Hindustan Aeronautics Limited's (HAL) pet project Dornier 228 is seeking to join the illustrious fleet for regional connectivity. The military aircraft has been tweaked with an upgraded engine, propeller as well as interior decoration and avionics. The 19-seater, twin turboprop aircraft received the formal clearance from DGCA late last year and have also undergone trial flights from Kanpur to Nashik to press them into commercial use. The 'civilian' Dornier was also on display at the recent Wings India 2018 held in Hyderabad much to the delight of potential buyers, not only for the ones who are looking to venture into RCS but also those operating chartered flight operations.

While the buzz around Do 228 will take long to pipe down, it may find a competitor in National Aerospace Laboratories (NAL) produced 19-seater aircraft Saras, touted to be more technologically advanced than the former. Apart from being a whopping ₹15 crore cheaper than Dornier (priced ₹60 crore), the upgraded Saras Mk-2 scores high on the features board too with drag and weight reduction, high cruise speed, lower fuel consumption and is operable from high and hot airfield as well. Interestingly, HAL will head the production of the military version of Saras while a private company will hold the reigns of the 'civilian' Saras. The aircraft is now being tested by the pilots of the Indian Air Force (IAF) and has made two successful test flights this year.

This isn't HAL's first rodeo either. The state-owned aerospace and father company had previously assembled the 44-seater Aero748 aircraft for commercial airlines at its before discontinuing it in 1988.



DO-228-201 UPGRADED CIVIL VERSION OF DORNIER

## A HELI STORY

Not only HAL's turboprop jets, the multi-role helicopter Dhruv is a likely contender for the round two of UDAN especially after the phase II of the biddings received interest from helicopter operators. The twin engine helicopter was on display at the aviation show in Hyderabad and is likely to grab many eyeballs at the ongoing Defexpo 2018 too. The indigenously designed and developed advanced light helicopter is a multi-new generation helicopter in the 5.5-tonne weight class and is used by all the three defence forces due to its versatile features. Four choppers are also used by IAF's Sarang aerobatic squad and it also made news

after being used in an offensive operation in Pakistan occupied Kashmir territory for 'surgical strike' in 2016. However, the civilian version, Dhruv Mk III. The helicopter's civil variant is also a popular choice for chartered operations and with 33 proposals for helicopter operations on 502 routes for UDAN II, the future looks promising. According to reports, in a first of sorts, HAL is also in the process of identifying a private entity with whom it will share the technology for the production of twin-engine combat helicopter in India. The private player will also be given the option of selling the choppers itself or through HAL.

## FORCE IS STRONG WITH RCS

Another perk for RCS flights is access to defence air base. IAF will allow its Hindon base, based in Ghaziabad, to be used for UDAN flights operating to Tier-II and Tier-III cities. Recently Air Marshal C. Hari Kumar, Air Officer Commander in Chief, Western Command, also suggested using Halwara Air Force base for normal and cargo flights. He reportedly said, "Many of the Air Force Stations, including in Leh, Srinagar, Jammu, Pathankot and Adampur, are being also used for normal flights and if Halwara is also opened to other flights, we are not restricting anybody. It will offer cheaper air travel service to the citizens. The decision of starting normal flights from the Air Force Station will be taken by the Indian Government and Air Force." Not only this, the process of developing a civil enclave terminal adjoining the IAF's Trishul air base in Barreilly. •

# Goa Shipyard – Redefining excellence

By **SP'S CORRESPONDENT**

**G**oa Shipyard Limited (GSL) has positioned itself as a fastest growing shipbuilder on the west coast of India, capable of designing and building high technology and sophisticated ships. With an unmatched track record of timely execution and delivery at 'fixed cost' of over 200 ships and more than 160 fast interceptor boats, GSL stands as the success story of the changing face of Indian defence shipyards.

Equipped with an in-house design capability and most modern facilities, GSL has excelled in its core competence area of building a wide range of patrol vessels, missile boats, landing crafts, training vessels, survey vessels, sail training ships, fast patrol vessels and yardscrafts for the defence sector, besides other types of vessels in the commercial sector. GSL has capability to design and build ships to customer's requirements and its in-house R&D unit is recognised by DSIR, Ministry of Science & Technology, Government of India.

The last four years have seen transformational performance by shipyard in all quarters. The Shipyard established unique benchmark in Indian Shipbuilding by delivering over 23 ships, all ahead of schedule, amounting to Gross tonnage of 32,000 tonnes (12,000 tonnes in FY 17-18), highest in the industry.

The shipyard has recently completed Coast Guard Advanced Offshore Patrol Vessel Project (AOPV) involving six ships, with delivery of the last vessel in November 2017. Based on the superior operational performance of these vessels and reduced 'build periods' achieved by the shipyard, Coast Guard has placed order for construction of additional five OPVs, work for which commenced in March 17 with delivery scheduled in 2020-21.

The shipyard, with its excellent track record has made significant inroads into global market with export of diverse vessels to Indian Ocean region (IOR) countries. 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 two FPVs to Mauritius, and a damage control simulator to Myanmar. These projects again were delivered ahead of schedule and superior build quality led to accolades at the highest levels.

Riding on the success wave, GSL has a promising future as it is scheduled to execute highly challenging state of the art Projects for 12 Mine Counter Measure Vessels (MCMVs) and two advanced missile frigates for Indian Navy. For construction MCMVs, majority of infrastructure, expertise and planning has been put into place so as to start construction by 2019/20. The requisite infrastructure is almost complete with balance 15 per cent to 20 per cent likely to complete by 2019-20. Post completion of MCMV infrastructure, GSL would be the only Shipyard in India to be armed with specialised construction technology of GRP composite hull for MCMVs.

With regards to advanced missile frigates 1135.6, 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. This Project will aid in consolidating GSL's position in construction of large weapon intensive platforms.

Constantly building and consolidating its experience gained over half a century and reputation for excellence and consistent track record of timely deliveries, GSL today, confidently looks ahead to successfully meet the challenges of the future requirement of our forces indigenously. •



# Dazzle on the beach



By **ROHIT SRIVASTAVA**

Prime Minister Narendra Modi, in presence of the three service chiefs, witnessed a demonstration of beach attack by the three services utilising Indian manufactured equipment.

The demonstration brought alive the action and thrills of war. In the blazing summer sun, the audiences were made to feel the heat and dust that can deter people from moving but does not have any effect on the men who are trained to fight war.

The demo started with eight Naval Marine Commandos (Marcos) doing a para-jump from the Hindustan Aeronautics Limited (HAL)-made Dornier transport aircraft which was followed by shore attack by four Indian-made naval vessels, simulating destruction of the anti-aircraft battery, before ingress by the Marcos. Soon after eight more marcos slithered down from Sea King and HAL's advanced light helicopter and took positions on the beach.

This was followed by simulation of asymmetric attack on the naval ships by fast interceptor craft which were repulsed by the ships using their fire power. This demonstrated how ships defend themselves against small craft which are swift and difficult to detect from a long range.

Thereafter, the air was filled by the roar of aircraft engines. In the flying demonstration HAL designed and developed light utility helicopter (LUH), ALH Dhruv, Armed ALH Rudra and light attack helicopters along with HTT-40 trainers, Hawk-I and Do-228 participated.

HAL manufactured fixed wing aircraft flew in a formation led by Su-30 MKI which was flanked by LCA Tejas and Jaguar.

Later, DRDO's Arjun Mk-II and wheeled armoured amphibious personal carrier (WhAP) demonstrated their prowess.

Not leaving behind the Indian private sector, the DRDO-designed and private sector manufactured 155mm/52 calibre Advanced Towed Artillery Gun and Ordnance Factory Board's developed 155mm/45 calibre artillery demonstrated their moves. •

## Kalyani Group achieves major breakthrough

Within a short span of three years, the Kalyani Group with its proven engineering prowess and armoring capabilities has emerged to be a formidable leader in the Protected Vehicles Segment. Their product profile boasts of vehicles like the Armoured Personnel Carrier (APC), Light Bullet Resistant Vehicle (LBRV), Ultra-Light Strike Vehicle (ULSV), Light Armoured Vehicle (LAM) and the Armoured Troop Carrier (ATC).

The Group's flagship company Bharat Forge Ltd has recently bagged two major export orders in the Protected Vehicles segment. The first order of 10 numbers is for the 4 x 4 Armoured Personnel Carrier (APC), Class II (STANAG 4569) for the UN missions of Indian Army. A first of its kind in the country in its class and category, the APC is specially designed and built to meet specific requirements of forces operating in rough terrain and areas affected by mine blasts. Powered by ruggedised, 230-280 HP diesel engine and paired with a 4 x 2/4 x 4 manual and automatic transmissions, it provides blast protection against 14 kgs TNT blast under hull, 21 kgs TNT blast under any wheels. The best in its class of 4 x 4, it has a Kerb weight ranging from 10 tonnes to 11.5 tonnes and payload capacity of 2 tonnes to 1.5 tonnes.

The Group's flagship company Bharat Forge Ltd has also bagged a big order to supply its Armour Troop Carrier (ATC) to an Asian country. Uniquely designed and built to provide logistic movements of troops in peacekeeping missions and forward areas, this mean machine is powered by ruggedised 230-280 HP diesel engine, paired with a 4 x 2/4 x 4 manual and automatic transmissions. It is capable of carrying 12 to 14 crew members with large cargo, with protection against 6 kg TNT blast and modular enough to be used as command control vehicle and also as ambulance in emergencies.

Both the APC and ATC are suitably fitted with 360 degree rotating armored turret with modular weapon mounts to meet lethality requirements. The vehicles have been successfully tested and evaluated by armies globally, including Indian Army.

Rajinder Singh Bhatia, President and CEO (Defence and Aerospace) at Bharat Forge Ltd said, "Kalyani Group has always been the pioneers of new technology and our philosophy is to always provide the best solution to the users. In this segment too, we want to make world class products with focus on three main requirements of any user – provide best lethality, with off road mobility and optimum protection." •



# From Scorpene class submarines to stealth frigates, Mazagon Dock is all about 'Make In India'

Chairman and Managing Director, MDL, **Commodore Rakesh Anand (Retd)** shares his indigenisation plans with **Arpita Kala** of *SP's ShowNews*

## SP's ShowNews (SP's): What's your take on the 'Make in India' initiative?

**Commodore Rakesh Anand (Retd) (Anand):** MDL has always had a strong commitment towards indigenisation as is evident from the fact that the percentage of indigenisation in the ships built by MDL has increased from 42 per cent (Delhi class) in the year 1997 to approximately 59 per cent (Kolkata class) in the year 2015-16. Further, it is planned to achieve the indigenisation content to the tune of 47 per cent in the ongoing construction of the six Scorpene submarines, which are planned to be delivered till 2020. Presently construction of four ships each of P-15B destroyers and P-17A stealth frigates is in progress in MDL. The indigenisation content in these two platforms is expected to the tune of 72 per cent and 75 per cent respectively.

## SP's: What does your road map of indigenisation entail?

**Anand:** MDL has drawn up a clear road map for indigenisation, which is part of its Long Term Perspective Plan. It spells out in detail our efforts to encourage indigenisation. MDL is committed to continuously enhancing the indigenous content of the ships, submarines and other vessels being built to ensure that the 'Make in India' mission launched by the government is a success story in letter and spirit. A 'Make in India' cell is active in MDL since May 2015 and to further boost and strengthen the indigenisation effort a dedicated indigenisation department has been set-up in Nov 2015 to provide focused impetus to the Prime Minister's vision of 'Make in India'.

## SP's: How do you think MDL has contributed to warship-building in India?

**Anand:** After being acquired by the government of India in 1960, with the chief objective of building warships for the growing Indian Navy, the first major programme was the building of the Leander class frigates, wherein six frigates were built under the transfer of the technology from the British Admiralty. Since then, MDL has not looked back, moving from strength to strength, building Coast Guard OPVs, Khukri class corvettes, Godavari class frigates, SSK submarines, Delhi class destroyers, 1241 RE missile ships, Shivalik class stealth frigates and Kolkata class destroyers, all in quick succession, taking indigenous warship and submarine building to dizzying new heights. In fact, warships are being built at such a prolific pace, that the history of warship building at MDL literally maps the history of indigenous warship building in India.

## SP's: How did the SSK programme come about?

**Anand:** In the early 1980s, MDL was selected to execute India's first ever submarine construction programme. Despite having no past exposure in this highly specialised field, MDL successfully completed this project, in which two SSK class submarines were built in India. That these two submarines are operating even today, after more than 20 years of yeoman service to the nation, speaks volumes of the skills to the MDL workforce, and capabilities of the yard.

## SP's: Did the successful production of diesel-electric submarines inspire the Scorpene Submarine Programme?

**Anand:** At the best of times, construction of submarines is an extremely complex task, given the compactness and density of equipment and systems installed onboard. A typical conventional submarine has approximately 6,500 equipment, kilometres and kilometres of cabling and piping, fitted in a hull of around 6.2 metre diameter, making it a highly congested and challenging working environment. The congestion results in numerous interdependent activities, thereby requiring specialised skill sets for completing outfitting activities safely, as per schedule and without a compromise of quality. Furthermore, construction of each modern day submarine entails almost ten lakh extensive and complex inspections. Despite this, MDL has matched, and even exceeded, the stringent quality norms, displaying the world class skills in weld-

ing, fabrication and integration. The unqualified success of the SSK programme made MDL the natural choice for the execution subsequently of 6 Scorpene Submarine Programme, which is one of the biggest submarine construction programmes globally. SSK class programme is going on, we've modernised all four of them and stew in the final process of negotiations and certifications.

## SP's: Any update on the INS Kalvari?

**Anand:** The first Scorpene submarine, Kalvari, has been delivered to the Indian Navy after being successfully cleared extensive tests and trials. The second submarine is at an advanced stage of sea trials and the third submarine was launched in January 2018. The remaining three submarines are in the various stages of outfitting. We have successfully fired a torpedo and a missile, which has made history in ship building because generally these weapons are fired after the platform is commissioned. Here, with the help of Navy and our collaborators, the submarine has already dived to the maximum diving depth and she's getting integrated with the Naval fleet. It's a very good product that we've delivered.

## SP's: Please share MDL's vision for the coming years.

**Anand:** In the next two to three years, we have plans for a diversified product rate and forward looking technologies. We are in the process of creating a greenfield shipyard where we want to take all ship repairs, exports and even non-naval businesses like solar research vessels. That is our thrust area at the moment. The technology for warships keeps changing every five years... so one of our main aim is to be adaptable. Secondly at MDL, we have all capabilities but limited infrastructure. So, that's being worked out and we are diversifying but not for simpler ships but for newer technology. So we're talking to other interested countries too for a joint venture because technology cannot be developed in isolation. Exports are something we can definitely look at now because we are expanding simultaneously. •

*With inputs from Neetu Dhulia*

## VISIT HFCL ON BOOTH 3.1.2, HALL # 3



HFCL to demonstrate Border Management System comprising of fully integrated Command & Control System (GIS based) with VMS and Video Analytics integrated with Radar, Thermal Camera/IR Camera, Unattended Ground Sensor, Underground Fiber based Detection System and Detection System for Fence (Fiber based).

HFCL also showcases indigenous Counter UAV Systems for Civil Aviation, Critical Infrastructure and Air-Base Security.



# Indian Army to finally get 'Made in India' bulletproof jackets

Looks like ninth time is the charm for Ministry of Defence

By **ARPITA KALA**

After a nine year long wait, the Ministry of Defence (MoD) announced that it will acquire 1,86,138 bulletproof jackets for a cost of Rs 639 crore, from indigenous defence manufacturer SMPP Pvt Ltd. SMPP specialises in bulletproof solutions and has already supplied bullet proof products to Indian Air Force, Naval Commandos, Paramilitary forces like BSF, CRPF, CISF, ITBP, NSG and state police forces of Gujarat, Uttar Pradesh, Telangana, Maharashtra, Jammu and Kashmir and Kolkata in addition to various forces around the world.

As per the contract SMPP will start the supply of jackets within next few months and complete within a period of three years.

The ordered jackets manufactured by SMPP would be ultra-light in weight and provide a 360 degree protection. A soldier wearing the jacket is protected from all sides and can even choose to add protection of throat and groin as per the combat need. Speaking on the occasion Dr S.C. Kansal, Chairman & Managing Director of SMPP, said "The new jackets meet the most advanced GSQR 1438 standards of Indian Army. These bulletproof jackets have Boron Carbide Ceramic which is the lightest material for ballistic protection. This makes SMPP bullet proof jackets the best of the class ballistic protection jacket and will be able to provide ballistic protection at the lowest possible weight." Meanwhile the Executive Director of the company, Ashish Kansal, says that



SMPP is one of the five companies in the world to manufacture Boron Carbide Ceramics which are the lightest and one of the hardest materials used for stopping bullets. SMPP is regularly supplying ballistic protection solutions to worldwide including countries like Germany, France, Australia, UK, Russia and Israel among others. Now the Indian army will also get this most advanced light-weight protection. These jackets will be manufactured as part of the 'Make in India' initiative. Indigenous manufacturing of jackets will create employment and technology innovation besides cost efficiency and economic growth. SMPP had also bagged the National Award by MoD in 1998 for Tank Ammunition and Technology Award for Bullet Proof Jackets in 2017.

The social media had been buzzing with netizens keeping track of this news with many mixed with the nine year long wait. A user took to Twitter to write- "Finally a good news for the our dedicated country men #Army. This came very late despite multiple requests. They deserve everything under planet for their selfless service protecting the nation and its ppl" while a few others are demanding answers with a user tweeting - "finally the much awaited BU "LATE" Proof jacket will now be available to #IndianArmy.. irony is that foreign country like america and britain uses #madeinindia jacket but it takes our govt. 9 yrs to sanction the project for @adgpi question is WHY 9 YRS. •

## BEML unveils bullet proof vehicle

BEML Limited, a Public Sector Company under the Ministry of Defence, has launched Medium Bullet Proof 4x4 Vehicle (MBPV 4x4) for use in counter insurgency operations at Defexpo 2018.

The BEML MBPV, is a 4x4 Wheel RH Drive heavy duty all weather off-road mobility vehicle, specially designed for easy maneuverability, operability and maintainability.



This advanced blast protected and bullet proof vehicle shields the security personnel from small arms fire, hand grenades and fragment simulated projectiles, etc. With survivability as the major objective, the MBPV 4x4 has a carrying capacity of 10+2 persons.

Launching the MBPV 4x4, Deepak Kumar Hota, Chairman and Managing Director, BEML, said, "The BEML MBPV 4x4, built on an indigenously developed 4X4 chassis, showcases

our commitment for realising the mission of 'Make in India' through our own R&D and delivering world class products for the defence sector."

BEML is a major participant at the Defexpo 2018 by showcasing Defence Equipments like Armoured Recovery & Repair Vehicle (ARRV), BEML Tatra 8x8 VP13S vehicle platform with super structure, trawl equipment for T-72 Tank, Aircraft Towing Tractor (ATT B10), Command Post Vehicle and live demonstration of Bulldozer and Motor Grader and other defence aggregates. •

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