SEE US AT HALL 6 STALL 6.2.10

Defence Exhibition Organisation
Ministry of Defence
Government of India

Ministry of Defence
Government of India

India The Emerging Defence Manufacturing Hub
DEFEXPO 18 INDIA
11-14 APRIL 2018 CHENNAI
Ministry of Defence

DAY-1
WEDNESDAY,
APRIL 11, 2018

SP'S SHOWNEWS

AN SP GUIDE PUBLICATION

PUBLISHERS OF
SP'S MILITARY YEARBOOK, SP'S CIVIL AVIATION YEARBOOK, SP'S AVIATION, SP'S AIRBUZ, SP'S LAND FORCES, SP'S NAVAL FORCES, SP'S M.A.I. & BIZAVINDIA

INSIDE

PHOTOGRAPHS BY SP GUIDE PUBNS & RESPECTIVE ORGANISATIONS

FOLLOW US ON facebook SPPublications

DEFEXPO 2018 OPENS TODAY

DEFEXPO ARRIVES IN CHENNAI

After visiting the tourist paradise of Goa on the shores of Arabian Sea, Defexpo has anchored on the beaches of Kancheepuram, on the south-east coast of India, washed, by the waters of Bay of Bengal

DESERT FERRARI MBT ARJUN MK II AT LIVE DEMO DRY RUN AT DEFEXPO 2018

By **ROHIT SRIVASTAVA**

India's Land, Naval and Internal Homeland Security Systems exhibition Defexpo, the latest edition of the biannual event, will see its formal inauguration tomorrow by Prime Minister Narendra Modi. This is an exciting surprise for the whole of defence and security fraternity. However, this is not the only first during the show, there are many.

Speaking to journalists in the national capital during the curtain raiser press conference, on April 4, Secretary for Defence Production Ajay Kumar, said, "India is emerging as a major defence manufacturing hub. Defexpo 2018 will help India as an exporter of defence systems and components." According to him, last year India has produced weapons worth ₹55,000 crore.

For the first time, India will project its defence manufacturing capabilities to the world. This is reflected in the tagline for the show, 'India: The Emerging Defence Manufacturing Hub'. "While showcasing strengths of India's substantial public sector, it will also uncover India's growing private industry and spreading MSME base for components and sub-systems," Ministry said in a statement. India is showcasing 70 homemade weapons to the world.

Talking about the FDI clauses, in the recently released Draft Defence Production Policy, Kumar said that government is planning to increase the FDI cap from 49 per cent to 74 per cent in niche areas where the country has not been able to develop it and may not be able to develop in the coming years. He also mentioned how many of Indian SMEs are exporting components and subsystems to global defence manufacturers.

Ministry of Defence (MoD), on March 22 this year, came up with a draft Defence Production Policy (DPrP) 2018 with intent to "promote domestic production by public sector, the private sector and MSMEs." This draft is a follow up to the production policy of 2011.

In the draft DPrP, Government is targeting to "achieve a turnover of ₹1,70,000 crore ($26 billion approx) in defence goods and services by 2025 involving an additional investment of nearly ₹70,000 crore ($10 billion approximately) creating employment for nearly two to three million people." In addition, the govern-

Interestingly this edition of Defexpo will have two distinctions.

- **First, the show will give an opportunity to visitors to witness Indian naval ships docking at the coasts.**
- **Second, while the show does remain military (in nature) encompassing various kind of systems, sub-systems and sub-sub-systems of weaponry/ missiles/ammunitions/fighters/ tanks/radars/ EW/ CW/warships/ submarines, etc. on display; the visitors will have a delight to evaluate and experience range of coffee flavours and delights... by Starbucks. No wonder if we shall be able to experience 'Chaayos' and 'Sagar Ratna' in next editions of Defexpo which will be more towards 'Make in India'.**

ment also wants India to achieve export of ₹35,000 crore ($5 billion approximately) in defence goods and services by 2025 and a global leadership position in the field of cyberspace and artificial intelligence based technologies. According to the government, in the financial year 2016-17, the total value of defence production was ₹55,894 crore, around ₹12,000 crore above the 2013-14 value.

In its tenth edition, the show will see the participation of 677 exhibitors which includes 523 Indian exhibitors and 154 international exhibitors. Nearly 15 per cent of the total exhibition space has been booked by medium small and micro enterprises (MSME). In terms of area, this edition is spread over 2,90,000 square feet which is 65,000 square feet more than the Goa edition.

Some of the leading Indian participants include industrial majors like Tata, L&T, Bharat Forge, Mahindra, Defence Research and Development Organisation (DRDO), Hindustan Aeronatics Limited (HAL), Bharat Electronics Limited, Bharat Dynamics Limited, Bharat Earth Movers Limited, Mazagon Dock Shipbuilders Limited, Garden Reach Shipyard and Engineers, Goa Shipyard Limited, Hindustan Shipyard Limited, Mishra Dhatu Nigam, Ordnance Factories and others.

Major international companies include Lockheed Martin, Boeing (USA), Saab (Sweden), Airbus, Rafael (France), Rosonboronexport, United Shipbuilding (Russia), BAE Systems (UK), Sibat (Israel), Wartsila (Finland), Rhode and Schwarz (Germany) among many others.

As mentioned in the press conference, around 47 official delegations from different countries will participate out of which 18 of them are ministerial-level delegations. Around 20 countries are bringing large delegations with over 10 delegates. Ministerial-level delegations are from countries including USA, UK, Afghanistan, Czech Republic, Finland, Italy, Madagascar, Myanmar, Nepal, Portugal, Republic of Korea, Seychelles and Vietnam.

Till now, the show has seen the display models of the naval ship but thanks to the location, for the first time, Indian Naval ships will participate in the show and will show operational demonstrations on April 14. INS Sahyadri and Kamorta will also be available for onboard viewing on Chennai harbour. In another first, the participants will be enthralled by the flying demonstration of Indian aircraft like light combat aircraft 'Tejas', weaponised advanced light helicopter and others. The show will also witness the maiden live demonstration by Indian land systems.

India will proudly present its Naval designing capabilities in shipbuilding. India is one of the few countries of the world with capabilities to design a naval vessel from scratch to finish. India will also physically showcase, along with the shoreline several frigates, corvettes and other ships. The exhibition will also unveil India's capabilities in manufacturing Scorpene class submarine.

As regards to land systems, India will unveil it's under development 155mm Advanced Towed Artillery Gun (ATAG) which has been designed and developed by DRDO in partnership with Kalyani Group, Tata Power. India also proposes to showcase its tank making capabilities, including MBT Arjun, T90 and T-72, Bridge Laying Tanks (BLTs) with a span of over 70 feet among others. India will also be showcasing OFB made 155mm/45 calibre artillery gun 'Dhanush'. Defexpo will also provide an opportunity to showcase India's plans for putting India on the global map of small arms manufacturing with its decision to manufacture about 7,50,000 assault rifles, 3,50,000 carbines and about 40,000 LMGs.

On February 28, Defence Acquisition Council (DAC), chaired by Defence Minister Nirmala Sitharaman, accorded approval for procurement of 41,000 LMGs and over 3,50,000 close quarter battle carbines under 'Buy and Make (Indian)' category. Out of total quantities envisaged, 75 percent will be through Indian Industry under 'Buy & Make (Indian)' category and balance through OFB. The total cost for procurement of Carbines and LMGs for the soldiers of the three Services is ₹4,607 crore and ₹3,000 crore respectively.

Earlier in the month, on February 13, DAC approved procurement of essential quantity of LMGs for the three Services through the Fast Track Procedure at an estimated cost of over ₹1,819 crore. This will be over and above the decision of February 28. DAC also approved the much-anticipated procurement of 7,40,000 assault rifles for the three Services. These rifles will be 'Made in India' under the categorisation

Continued on page 13...

PUBLISHER AND EDITOR-IN-CHIEF
Jayant Baranwal

DEPUTY MANAGING EDITOR
Neetu Dhulia

SENIOR CONTRIBUTORS
Air Marshal (Retd) B.K. Pandey
Lt General (Retd) Naresh Chand
Lt General (Retd) P.C. Katoch
Lt General (Retd) V.K. Kapoor
Rear Admiral (Retd) S.K. Ramsay

ASSISTANT FEATURES EDITOR
Arpita Kala

PRINCIPAL CORRESPONDENT
Rohit Srivastava

CHAIRMAN & MANAGING DIRECTOR
Jayant Baranwal

PLANNING & BUSINESS DEVELOPMENT
Executive Vice President: Rohit Goel

SALES & MARKETING
Director: Neetu Dhulia
General Manager Sales: Rajeev Chugh

CREATIVE DIRECTOR
Anoop Kamath

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

Printed at Kala Jyoti Prcoess Pvt Ltd, Hyderabad

www.spguidepublications.com

SP GUIDE PUBLICATIONS

"F/A-18 Super Hornet for India: Tested and Built for the Future"

Boeing India President **Pratyush Kumar** talks to ***SP's ShowNews*** on why India should seriously consider the F/A-18 Super Hornet for its fighter requirements and building India's aerospace industry

***SP's ShowNews* (SP's): How do you feel about fighter opportunities for both the Navy and Air Force?**
Pratyush Kumar (Kumar): The Super Hornet would be a good option for India to evaluate for its Navy and Air Force's fighter requirements due to its combat proven multi-role capabilities, advanced survivability, with room to grow and having the lowest cost per flight hour among all US tactical combat fighters including single engine fighters.

The Super Hornet brings the latest generation of technologies to the warfighter. With designed-in stealth and robust capability growth plan, the Super Hornet is the best aircraft to get to India's Advanced Medium Combat Aircraft (AMCA) programme.

BOEING F/A-18 SUPER HORNET

SP's: What would be the best approach for India as it evaluates strengthening its fighter capability?
Kumar: India has twin objectives – to modernise the capability of the defence services and to create an industrial base with a substantial indigenous footprint. A critical requirement of any such roadmap should be to create the industrial scale to enable Make in India which can only be achieved by considering commonality of parts such as radars and engines across platforms. Uncoordinated procurement loses this important lever. Given this, we want to follow the lead of the Ministry of Defence (MoD) instead of just pushing for sales of platforms.

SP's: What are your plans to make the F/A-18s in India?
Kumar: Boeing has been working with suppliers in India for over two decades in manufacturing, IT and engineering services and Indian companies are integrated in our global supply chain. Today, there are more than 160 suppliers providing parts and assemblies covering commodities such as aerostructures, wire harness, composites, forgings, avionics mission systems, and ground support equipment.

Boeing's 'Make in India' plans for the Super Hornet is to build an entirely new and state-of-the-art production facility that can be utilised for other programs like India's Advanced Medium Combat Aircraft (AMCA) programme. We are prepared to bring Boeing's global scale and supply chain, its best-in-industry precision manufacturing processes, as well as the company's unrivaled experience designing and optimising aerospace production facilities to both expand India's aerospace ecosystem and help realize the 'Make in India' vision. The programme envisages transitioning airframe and subsystem manufacture to Indian industry in a deliberate way, representing extraordinary opportunity for technology insertion and growth within India's aerospace industry.

SP's: Your thoughts on the relationship between the United States and India and how that's evolved over the last decade?
Kumar: We have seen great positive energy and strong participation across our governments. India is now a Major Defense Partner of the US Put simply, an expanded partnership between the United States and India will allow us to create greater prosperity for both our nations and stand as mutually reinforcing engines of growth and innovation. •

BOEING AT DEFEXPO – SHOWCASING ITS CAPABILITY

Boeing will showcase advanced capabilities of its multi-role F/A-18 Super Hornet fighter, AH-64 Apache combat helicopter, KC-46 tanker, P-8I long range maritime surveillance aircraft and services. The company's contributions to 'Make in India' and continued focus on fully harnessing India's manufacturing capability, talent, innovation and productivity to deliver a cost efficient supply chain from India will also be highlighted.

At its exhibit in Hall 3, Boeing will showcase to Defexpo visitors large-scale models, displays and smart panel content of the F/A-18 Super Hornet, CH-47F Chinook, AH-64E Apache, P-8, C-17 Globemaster III, unmanned systems such as ScanEagle, Integrator and Wave Glider and Harpoon missiles. An F/A-18 E/F Simulator will also be available at the booth for visitors to experience.

During the show, Boeing will also highlight its focus on fully harnessing country's industrial capability, engineering talent and productivity to establish a cost proficient supply chain from India. •

General Atomics - All set for MQ-25 'Stingray'

On February 13, General Atomics Aeronautical Systems, Inc. (GA-ASI) announced its industry partnership for the US Navy's Carrier Based Aerial Refuelling System (CBARS) or MQ-25 Stingray. When inducted, MQ-25 will be US Navy's first carrier based unmanned aircraft system (UAS). The other two contenders for the project are Boeing and Lockheed Martin.

GA-ASI is offering a purpose-built MQ-25A Stingray, optimised for the tanking mission, which wills double the range of the carrier based aircraft. "Our offering exceeds all of the Navy's requirements, including carrier suitability," GA-ASI said in the release. Currently, US Navy is using F/A-18 'Rhino' for fleet tanker roles.

"As the world's premier quick reaction unmanned aircraft system manufacturer, we are committed to delivering the most effective, affordable, sustainable, and adaptable carrier-based aerial refueling system at the lowest technical and schedule risk," said David. R. Alexander, President, GA-ASI. "This collaboration of the best in aerospace industry will provide the US Navy with a fleet ready unmanned tanker with exceptional growth, well within the Navy's preferred timeline."

Initially MQ-25 will act primarily as a fleet tanker, but it may be developed later for other roles. For the project, General Atomics is collaborating with Boeing Autonomous Systems on aviation, Pratt & Whitney for high-bypass PW815 commercial engine, UTC Aerospace Systems for landing gear, L3 Technologies for communications systems, BAE Systems for software. The navigation technologies will come from Rockwell Collins. MQ-25 is expected to enter service with US Navy in mid-2020s. •

—Rohit Srivastava

PIONEERS IN AEROSPACE DRIVEN BY TECHNOLOGY

defexpo INDIA 2018

India : The Emerging Defence Manufacturing Hub

DEFEXPO 18 INDIA

11-14 APRIL 2018 CHENNAI

Ministry of Defence

हिएलि HAL

हिन्दुस्तान एरोनॉटिक्स लिमिटेड

HINDUSTAN AERONAUTICS LIMITED

www.hal-india.com

'Our annual procurement from India surpasses $550 mn from more than 45 Indian suppliers'

SP's ShowNews in conversation with **Pierre de Bausset**, President & MD, Airbus India

***SP's ShowNews* (SP's): How are you supporting the Government's 'Make in India' initiative?**

Pierre de Bausset (Bausset): To start with, we have put make in India front and centre of our business strategy here. We are increasing India's contribution to our global products and at the same time we have proposed multiple projects, especially in defence, to kick-start a defence focused industrial ecosystem in India.

Today, every Airbus commercial aircraft produced is partly 'Made in India'. Our annual procurement from India surpasses $550 million from more than 45 Indian suppliers. Airbus secures 6,000 jobs nationwide across all Airbus programmes, including 1,500 engineers.

In defence, the 'Make in India' programmes that we are pursuing with local partners are the manufacturing of the C295W military transport aircraft and helicopters. Once these programmes materialise we will set-up system integration and final assembly lines in India, which would require substantial investments and lead to the development of a robust aviation/defence ecosystem in the country. Once these programmes materialise we will set-up system integration and final assembly lines in India, which would require substantial investments and lead to the development of a robust aviation/defence ecosystem in the country.

SP's: Skill development is another area which is very dear to this government and it is all the more important in a high-technology field like aerospace and defence. What role are you playing here?

Bausset: As a company which is keen on creating an industrial ecosystem in India focused on aerospace and defence, we realise our responsibility to help in the skill development of the local work force. Airbus set up its innovation, research and engineering facilities in India to leverage the engineering talent in the country. The company employs about 80 per cent of its direct workforce in engineering roles in India. We work with our suppliers here and have created more than 6,000 jobs, including 1,500 engineers across the company and our supply chain network. If we get the defence programmes we are competing for then we will further ramp up our training and skilling programmes, working alongside partners.

We are also coming up with a greenfield training facility in New Delhi to support India's growing need for Airbus aircraft pilots and maintenance engineers. The investment in a training centre is a key strategic Airbus initiative in line with the country's "Skill India" programme launched in 2015 by the Indian government to develop a wide range of advanced competencies. The centre will have an initial capacity to train more than 800 pilots and 200 maintenance engineers annually.

SP's: Any update on your partnership with Mahindra Defence?

Bausset: We have already initiated industrial relationship to produce helicopter parts locally and are defining additional work packages to be industrialized in India allowing to reach the local content objective. We want to have the ground work ready for a quick take-off in case we are awarded a contract. Airbus Helicopters' proposal to manufacture the Panther and the H225M in India in partnership with Mahindra now falls under the ambit of the SP model. Our value proposition for these programmes is that we will help India create an indigenous defence industrial eco-system. •

AIRBUS TO SHOWCASE ITS 'MAKE IN INDIA' CAPABILITIES AT DEFEXPO 2018

AS565 MBE FROM PANTHER FAMILY

From cutting-edge, multirole helicopters to proven military transport aircraft, Airbus will exhibit its wide-ranging defence capabilities at Defexpo 2018. The product portfolio, which reflects the company's offerings and its willingness to contribute to a self-sustaining defence industry in India, will include scale models of the state-of-the-art twin-engine H225M helicopter as well as the all-weather medium rotorcraft AS565 MBe from the Panther family. Visitors to the Airbus booth in Hall 8, Stand 8.2.9 can also learn about the combat-proven A330 MRTT, the only new generation aerial refueller in service today. Also on display will be a scale model of the C295 military transport aircraft.

"We are excited about Defexpo 2018 and look forward to engaging with our partners and customers," said Pierre de Bausset, President and Managing Director, Airbus India. Many of the Airbus products at Defexpo 2018 directly align with the show's motto: 'India: The Emerging Defence Manufacturing Hub'. As part of the defence ministry's Avro replacement programme, Airbus has offered to support Tata Advanced Systems in setting up a final assembly line for the C295 transport aircraft in India.

Airbus has teamed up with Mahindra Defence and is proposing both the AS565MBe Panther and the H135M under the Naval Utility Helicopters (NUH) and the H225M under the Naval Multi Role Helicopters (NMRH) programmes, all with substantial Transfers of Technology and indigenisation compliant with 'Make in India' objectives. Additionally, there will be a model of VSR700 on display at the Airbus booth. The VSR700 is Airbus Helicopters' light military rotary-wing tactical unmanned aerial system. •

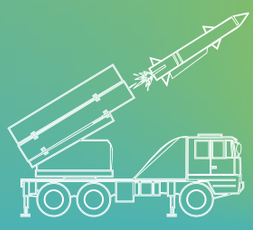
YOUR PARTNER FOR MAKE IN INDIA

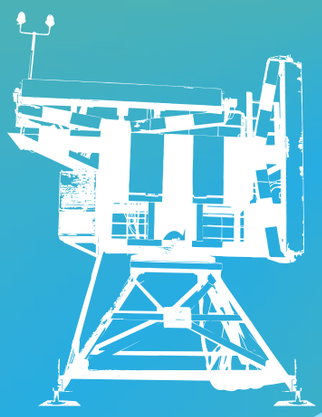
Astra Microwave Products Ltd.

PIONEERS IN STRATEGIC ELECTRONICS

- RESEARCH & DEVELOPMENT
- HIGH-VOLUME PRODUCTION
- STATE-OF-THE-ART INFRASTRUCTURE
- TOTAL QUALITY MANAGEMENT

EXPLORE
INNOVATE
INVENT





Visit us at Hall 4, Stall No.4.1.8b

DEFEXPO18 11-14 April Chennai

Astra Microwave Products Ltd.

Regd. Office: ASTRA Towers, Survey No. 12(P), Kothaguda post, Kondapur, Hitech City, Hyderabad 500084, Telangana, India.

Tel +91 40 30618000/8001 | Fax +91 40 30618048/8383

www.astramwp.com

Slow but not steady

Indian Army's situation, worst among the three services, will go further south, if the recently initiated procurement projects fails to achieve their objectives.

By **ROHIT SRIVASTAVA**

Indian Army is least modernised force among the three services. As per army's testimony to the parliamentary committee on defence, almost 70 per cent of its inventory is obsolete. This is an alarming situation. Due to various reasons including single vendor situation, cost and change in the staff requirements, India has not been able replace these legacy systems.

FUTURE INFANTRY COMBAT VEHICLE

To replace Russian vintage BMP-II Infantry Combat Vehicles, used by mechanised infantry for troop movement along with armour, Indian Army had planned to procure 2,300 Future Infantry Combat Vehicle (FICV) from Indian industry. The project received governments nod in 2009 and two tenders later is still far from start. The project is marred by the inability of the ministry to sort out the techno-industrial issues.

In future wars, mechanised infantry will be crucial in achieving battle objectives against our adversary in the plains and deserts of the western front. Currently, Indian army, is using Ordinance Factory Board (OFB) made Russian BMPs.

The first Expression of Interest (EoI) for the programme was send out in 2010 which was later cancelled in 2012. The second EoI was released in 2015 but no decision has been made as one of the contenders had raised objection on the selection criteria. The objections were sent to a panel of independent experts which has rejected them and the ministry is expected to give the go ahead.

Some of the major contenders for the project are Larsen and Toubro, Mahindra, Tata and OFB.

- 2009 – Government approval
- 2011 – EoI released
- 2012 – EoI cancelled
- 2015 – EoI re-issued

BATTLEFIELD MANAGEMENT SYSTEM

BattleField Management System (BMS) was part of the proposed Tactical Command, Control, Communications and Information (Tac C^3I) system for Indian Army. It was supposed to help the commanders in decision making process. The BMS was to comprise a tactical hand-held computer with individual warfighter and tactical computers at Battle Group HQ and combat vehicles, enabling generation of common operational picture by integrating inputs from all relevant sources through integrated use of a high data rate geographical information system (GIS) and GPS.

The BMS approach paper floated in early 2000s envisaged development, trials and General Staff evaluation in period 2008-2009, followed by its fielding into the Army during 2013-2017. But the MoD-Army red-tape and DRDO intervention to grab every project took over. Only by end 2011 Defence Acquisition Council approved the BMS as a 'Make India' project, followed by Integrated Project Management Study, Expression of Interest (EoI) prepared with industry empanelment pending with MoD, latter expected to be issued to the industry by August-September 2013. However, the EoI was finally issued only in February 2015, to 14 domestic companies, in which only two consortiums, Tata Power SED-L&T, and BEL-Rolta India, qualified the bids. In February 2016, MoD signaled these two consortia to develop BMS prototype that could eventually generate about 40,000-50,000 crore worth of procurement for 600 sets of BMS for the Army. But in December, reportedly, government was planning to scrap the project.

- 2000 – Approach paper
- 2015 – EoI issued
- 2016 – Selection of development agency
- 2017 – Programme to be cancelled

TACTICAL COMMUNICATION SYSTEM

As part of the plan to prepare for net centric warfare Army, in 1996, envisaged a tactical communication system (TCS) to replace legacy Army Radio Engineering Network. The project was first planned as an upgrade programme but took off in 2010 as a 'Make' programme. The EoI was sent to Indian companies including public sector in September 2010. After the evaluation of the proposals, two development agencies were to be selected to develop prototype for user trials and government was to fund 80 per cent of the prototype development cost.

Of the two developing agencies selected in 2014, one is the state-owned Bharat Electronics Limited (BEL). The second development agency involves a consortium made up of private sector defence companies, including Larsen & Toubro, Tata Power SED and HCL Ltd. Both have been tasked with each developing a TCS prototype at the cost of $100 million apiece.

- 1996 – Planned
- 2010 – EoI
- 2014 – Selection of development agency

ANTI-TANK GUIDED MISSILES

For anti-armour role, Indian army is still relying on second generation Russian Konkur and French Milan anti-tank guided missiles (ATGM). Country is in dire need to upgrade its anti-tank arsenal and it has made multiple efforts to


ALPHA DESIGN
TECHNOLOGIES
Make in INDIA
Make in ALPHA
VISIT US @ Hall - 1
Stall No. 1.1.7 and 1.2.8
defexpo 2018
India The Emerging Defence Manufacturing Hub
DEFEXPO 18
INDIA
11-14 APRIL 2018 CHENNAI
Ministry of Defence

buy state-of-the-art third generation ATGMs. The Request for Proposal (RFP) for the ATGMs was sent out in 2010 and the test for the missile was completed in August 2012. The bid was opened in May 2015 and the price negotiation was completed in April 2016.

After trials Indian Army selected Israel's spike missiles. Between April 2016 and December the company made foreign direct investment in India and showed its commitment to the Indian market. According to reports, the spike has been removed to make way for indigenous vehicle mounted Nag ATGMs, which has been under development since late 80s. Nag has been going through series of test, latest being two test that were conducted on September 8, last year.

India was expected to purchase around 8,000 Spike missiles and 300 launchers for $500 million to equip the Indian Army with cutting edge anti tank systems. In anticipation of the deal, Rafael joined hand with India's leading industrial house Kalyani Group to form Kalyani Rafael Advanced Systems (KRAS). The state-of-the-art facility of the KRAS was inaugurated at Hyderabad on August 6, last year. The plant was expected to manufacture the spike missile system through semi knocked down and completely knocked down kits.

- 2010 – RFP
- 2012 – Test conducted
- 2015 – Bid opened
- 2016 – Price negotiation
- 2017 – Reportedly cancelled

SMALL ARMS

The recent decision to procure modern small arms will go a long way in improving the fighting capability of the infantry soldier. In past, similar efforts to acquire modern sophisticated small arms have failed and one can hope this time the history will not get repeated. Even the current fast track sanction being 'Buy and make' will take a few years to take shape. In our comparison, adversaries have been equipping their forces with better weapons and we are lagging behind when the challenges are becoming greater.

On February 28, Defence Acquisition Council (DAC), chaired by Defence Minister Nirmala Sitharaman, accorded approval for procurement of 41,000 LMGs and over 3,50,000 Close Quarter Battle Carbines under Buy and Make (Indian) category. Out of total quantities envisaged, 75 per cent will be through Indian Industry under 'Buy & Make (Indian)' category and balance through OFB. The total cost for procurement of Carbines and LMGs for the soldiers of the three Services is ₹4,607 crore and ₹3,000 crore respectively.

Earlier in the month, on February 13, DAC approved procurement of essential quantity of LMGs for the three Services through the Fast Track Procedure at an estimated cost of over ₹1,819 crore. This will be over and above the decision of February 28. DAC also approved the much-anticipated procurement of 7,40,000 Assault Rifles for the three Services. These Rifles will be 'Made in India' under the categorisation of 'Buy and Make (Indian)', through both Ordnance Factory Board and Private Industry at an estimated cost of ₹12,280 crore.

In another decision, it approved the purchase of 5,719 Sniper Rifles for the Indian Army and Indian Air Force at an estimated cost of ₹982 crore.

For the immediate requirement of the troops deployed on the borders, MoD, on January 16, gave its nod for the procurement of 72,400 assault rifles and 93,895 carbines on fast track basis for ₹3,547 crore.

The main contenders for the small arms are Israel Weapon Industries, Kalashnikov Concern, Colt's Manufacturing Company, Heckler & Koch and FNHerstal.

- 2016 – RFI for Assault Rifle and RFI for Sniper rifle
- 2018 – Re-issued RFI for Assault Rifle

TOWED ARTILLERY

After the induction of FH-77B technology (Bofors) towed artillery, Indian army has been making efforts to procure artillery as per its artillery modernization plan. Defence Research and development Organisation in partnership with TataPower SED and Bharat Forge is developing an Advanced Towed Artillery Gun System (ATAGS), a 155/52 mm howitzer, to replace existing artillery guns. Similarly, based on Bofors technology public sector Ordinance Factory Board is developing a 'Dhanush' 155/45 mm towed gun. In 2016, Ministry of Defence gave approval for induction of 114 of these guns. The gun is under trail for last two years. The final order for Dhanush could go over 400 guns.

ATAGS, sanctioned in 2012, is also under going development trials.

- 2010 – DRDO starts ATAGS
- 2012 – Government sanctions ATAGS
- 2017 – Development trial begin
- 2010 – OFB starts Dhanush project
- 2016 – Approval for induction •

WITH BEST COMPLIMENTS

MAZAGON DOCK SHIPBUILDERS LIMITED

(A Government of India Undertaking)

Ship Builders to the Nation

www.mazagondock.in

First India Supplier Summit launches BAE Systems' Defexpo 2018 participation

By **SP's CORRESPONDENT**

Signalling its continued commitment to and focus on 'Make in India', BAE Systems hosted its first ever India Supplier Summit on April 5, in New Delhi. The Summit was held ahead of DefExpo, the country's biennial Land, Naval and Internal Homeland Security Systems exhibition slated for April 11-14 in Chennai. With participation from over a 100 representatives from a cross-section of Indian companies, the Summit served as a single platform of engagement between these Indian suppliers and the Company for its global supply chains in land systems, air, naval, electronics, and technology.

Paul Smith, Chief Procurement Officer, BAE Systems delivered the keynote at the Summit in the presence of Nik Khanna, Managing Director, India, and Dr Joe Senftle, Vice President & General Manager of Weapon Systems at BAE Systems.

Centerstage at Defexpo will be the M777 Ultra Lightweight Howitzer which will be on display for the first time since the Governments of India and the United States agreed the Foreign Military Sale of 145 of these weapon systems for the Indian Army in November 2016. The first two weapon systems arrived in India ahead of schedule in May 2017. Encouraged by Prime Minister Modi's call to "Make in India", BAE Systems has awarded the development of an Indian

PAUL SMITH, CHIEF PROCUREMENT OFFICER, BAE SYSTEMS PLC

Assembly, Integration and Test facility for the M777 to Mahindra and Mahindra. In addition, the conclusion of this procurement has paved the way for BAE Systems to make an investment of over $200 million in Indian defence suppliers.

Nik Khanna, Managing Director, India, BAE Systems, "The India Supplier Summit serves as an excellent springboard for our company's presence at Defexpo. In addition to showcasing the range of our capabilities and technologies, the Show provides us a focused platform to engage with our customers, users in the military, partners, suppliers and the industry at large, providing both direction and momentum in our plans to 'Make in India'."

To underline BAE Systems' capabilities for the naval forces, on display will be the Mk45Mod 4, the lightest, most compact, 5-inch fully automatic naval gun in the world and is the most widely deployed to the US Navy and other allied navies. The Show will also see BAE Systems strengthening its intent for industrial partnership on the 40Mk4 Naval Gun. An extremely flexible weapon system with its high rate of fire, 40Mk4 Naval Gun provides capability to switch between optimized ammunition types. In January this year, Finland became the third country to select this weapon system. The 'Make in India' Hawk advanced jet trainer, in service with the Indian Air Force and the Indian Navy, will also be on display at Defexpo. •

HAL soaring high on achievements

From being a license manufacturer, the company is coming up as an aircraft developer

By **ROHIT SRIVASTAVA**

India's defence aviation major, the Hindustan Aeronautics Limited (HAL) is undergoing exciting transformation. From being a license manufacturer, the company is coming up as an aircraft developer. In last one decade, HAL has developed armed version of advanced light helicopter (ALH) better known as 'Rudra', Light Combat Helicopter (LCH), HTT40 basic trainers, Hawk-I and civil version of Dornier 228.

The current success of the company is well reflected in its financial health. In the financial year 2017-18, HAL recorded a turnover of over ₹18,000 crore (provisional and unaudited), this is ₹400 crore more than the preceding financial year.

Reacting to the financial results, T. Suvarna Raju, Chairman and Managing Director, said, "The Company strongly supports the Indian Armed Forces with its indigenous and licence manufactured products. The Company has also continued to emphasise on self-reliance towards development of indigenous products, diversification into civil segment, enhancement of capacity, support development of defence manufacturing eco-system by developing domestic vendors (including MSMEs) and enhance outsourcing. These efforts will provide steady growth of the Company and opportunities to capitalise on the future requirements arising for Indian Armed Forces."

In an eventful year, HAL produced 40 new aircraft including choppers and 105 new engines. It also carried out overhaul of 220 aircraft/helicopters and 550 engines and has received order of 41 Advanced Light Helicopters 'Dhruv' and eight Chetak helicopters from Indian Armed Forces in the year 2017-18.

Last December, IAF sent Request for Proposal to HAL for 83 LCA 'Tejas' Mark 1A and 15 limited series LCH. In the other major achievements, it received Initial Operational Clearance (IOC) certificate for its Light Combat Helicopter (LCH), acceptance of Mirage 2000 upgrade by Indian Air Force (IAF) after its Final Operational Clearance, first successful run of Hindustan Turbo Shaft Engine -1200 and successful test firing of BrahMos missile from Su-30 MKI etc.

HAL has converted Do-228-201 multi-purpose light transport aircraft, operational with Indian armed forces, into a 19 seater turbo prop commuter aircraft. The aircraft received its type certification by Directorate General of Civil Aviation (DGCA) in 2017. The civil version was showcased during the recently held Wings India 2018, at Hyderabad, India's civil aviation expo.

Since January, HAL has made some significant technical gains. On January 31, it carried out first flight of light combat helicopter (Technology Demonstrator-2) with its own designed and developed automatic flight control system. The maiden flight lasted for 20 minutes. Few days later on February 7, another milestone was achieved, when Hawk-I, HAL upgraded BAE System's Hawk Mk132 trainer aircraft, made its first flight with indigenous Real Time Operating System. Similarly, taking the LCA Tejas towards FOC, on February 27, company carried out maiden hot refueling followed by a sortie at HAL airport, Bengaluru.

In a significant development which can give a flip to the private industry in the aviation sector, HAL is offering its ALH 'Dhruv' (civil version) "for manufacturing to potential Indian private companies through Transfer of Technology." •

Policy is the problem

The idea behind the production policy is to ensure self-reliance in defence. The draft production policy has proposed some impossible targets.

By **ROHIT SRIVASTAVA**

The Ministry of Defence (MoD), on March 22, came up with a draft Defence Production Policy (DPrP) 2018 with intent to "promote domestic production by public sector, the private sector and MSMEs." This draft is a follow up to the production policy 2011. KPMG, the leading consulting firm, in its comment has called the production policy "an attempt to consolidate the ongoing and proposed actions of the government towards boosting investment and in country manufacturing."

In the draft DPrP, Government is targeting to "achieve a turnover of ₹1,70,000 crore ($26 billion approximately) in defence goods and services by 2025 involving an additional investment of nearly ₹70,000 crore ($10 billion approximately) creating employment for nearly two to three million people." In addition, the government also wants India to achieve export of ₹35,000 crore ($5 billion approximately) in defence goods and services by 2025 and a global leadership position in the field of cyberspace and artificial intelligence based technologies. According to the government, in the financial year 2016-17, the total value of defence production was ₹55,894 crore, around ₹12,000 crore above the 2013-14 value.

In last seven years, since the launch of production policy in 2011, not much has been achieved by the Indians industry in this sector. Leaving aside the achievements of the Hindustan Aeronautics Limited (HAL) – like Advance Light Helicopter (ALH), Light Combat Helicopter (LCH), Light Utility Helicopter (LUH) and license manufacturing of various aircraft; and DRDO's strategic missiles, there are hardly any applaudable achievement of Indian public and the private sector. Till date, the private sector has failed to develop any new product.

GOALS AND OBJECTIVES

Through the DPrP, government intends to create a dynamic, robust and competitive tiered defence industrial ecosystem. This will be an "important part of the 'Make in India' initiative." By 2025, government wants "to reduce current dependence on imports and to achieve self-reliance in development and manufacture" of fighter aircraft, medium lift and utility helicopters, warships, land combat vehicles, autonomous weapon systems, missile systems, gun systems, small arms, ammunition, explosives, electronic warfare and communication systems. India also plans to export defence goods and services worth ₹35,000 crore ($5 billion approximately) by 2025.

In a welcome move, the government has recognised the importance of emerging technologies like artificial intelligence, robotic and nanotechnology in defence and intends to become a global leader in Cyberspace and Artificial Intelligence technologies. "Most leading countries are working frantically to achieve leadership in these technologies." The draft also calls for utilisation of Indian leadership in IT domain to acquire advantageous position in cyber space which has opened the fourth domain of warfare.

In addition, government is also planning to introduce 74 per cent FDI (foreign dircet investment), through automatic route, in niche areas. But the document does not define the niche areas. Calling for the relook at the provision, KPMG said, "If one needs to seek an approval for qualification of "niche technology" then "automatic route" is more or less redundant." Going by the private industry's capability in the futuristic technologies, like robotics or nanotechnology, one can anticipate 74 per cent FDI in these areas. The intellectual property rights for such technology and products will not be Indian, defeating the very purpose of product development.

The only way out is to encourage Indian companies to invest in futuristic weapons technologies. In fact, Indian companies are fortunate that they are making full-fledged foray into defence at a time when old weapon systems are being replaced by new kinds of weapon systems. In the field of new and emerging technologies, all players are somewhat on an equal footing and if not, it does not take much for a new player to catch up with the domain leaders.

In new era of new technology, like in past, we will witness demise of many of the established giants and emergence of new ones. This is the time for Indian firms to become global defence leaders using nanotechnology/artificial intelligence. The only catch is whether Indian firms are ready to invest and seize the opportunity or not.

In every defence industry seminar, stakeholders – be it government, public sector, private sector and development agency make tall claims but we all know how many of those claims are unfulfilled. We can safely say either one of them or all of them are lying. It is strange that India is neither able to buy through competitive bid, make hardware or develop a product of global standard. In spite of spending almost two decades in formulating defence procurement and production policy, India has not been able to come with a proper policy. If one visits the Ministry's website, one will encounter 35 different Defence Procurement Procedure (DPP) documents. One of the main reasons why defence industry is still in its nascent stage is the frequent amendments in the DPP. This is doing more damage than good. Until, India firms up DPP, the industry will not be able to firm up their business model.

> It is well known that the primary reason for India's inability to procure weapons, in a timely manner, is due to the paucity of funds and cumbersome DPP.

Defence production policy basically supplements the DPP. It is well known that the primary reason for India's inability to procure weapons, in a timely manner, is due to the paucity of funds and cumbersome DPP. Since production has to be in accordance with the procurement plan; the government will have to streamline defence procurement for the success of its production policy. This is the fundamental paradox.

DPP is focused on process not result. As long as process is being followed it does not matter whether the weapon gets procured or not. This is a procedure crafted by bureaucrats and political class for their own defence. Under no circumstances they want any allegation of benefiting any company. But since DPP is so cumbersome, India ends up purchasing hardware through government to government deal which gives enough room for making all kinds of allegation. Rafale deal is the latest example.

It seems the ghost of Bofors has not left the south block and is the guiding light of our defence policy makers. Till such time expect the DPrP to remain a paper policy. We can't expect them to walk the talk. •

DEFEXPO ARRIVES ...*Continued from page 2*

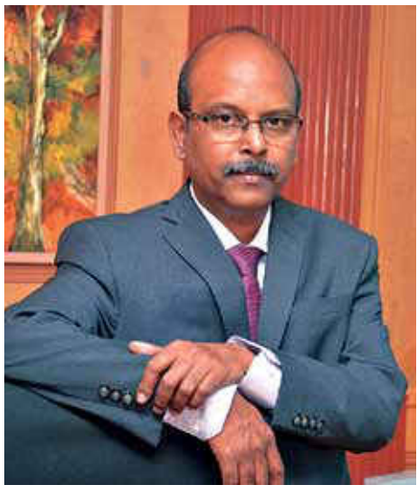
of 'Buy and Make (Indian)', through both Ordnance Factory Board and Private Industry at an estimated cost of ₹12,280 crore.

During the show, India and Russia will come together in the India Russia Military Industry Conference to discuss ways to strengthen the bilateral defence cooperation. Over 100 Russian and over 200 Indian industry leaders are expected to participate. The conference is being coordinated by Society of Indian Defence Manufacturers (SIDM) from Indian industry side.

Ahead of the show, a Joint Commission with South Korea will meet on April 9 to strengthen defence cooperation between the two friendly nations. Of late Seoul has shown lots of interest in Indian defence programmes and is interested in establishing joint ventures between defence companies of the two countries. On May 12, 2017, L&T had bagged the order for supplying 100 155 mm/52 calibres tracked mobile artillery guns. The gun is improved version of the South Korean Hanwha Tech Win (HTW) K9 Thunder.

During the show, first of its kind National Level Open Challenge Competition– "Solution to Problem" – Defexpo 2018 for finding solutions to the defence related problems by innovators, students, professionals, participants and foreign nationals who are attending Defexpo 2018. India Pavilion is being set up for the first time in Defexpo. The India Pavilion will showcase the combined strength of India's public sector and the private sector in defence production.

To take the show to interested people who could not fly to Chennai, the inauguration ceremony will be webcast to live audiences in Indian embassies across the world and will also be webcast on social media platforms including Facebook, Twitter, Periscope, etc. •



'India is one of the most lucrative defence markets globally with mega acquisition programmes coupled with the Government's firm resolve for defence modernisation'

SP's ShowNews talks to Chairman & Managing Director, BEL, **M.V. Gowtama** about his vision and priorities for BEL to achieve its objectives

***SP's ShowNews* (SP's): Could you talk about how successful BEL has been in attaining technological leadership in defence electronics? Please share details about the major achievements recently?**
M.V. Gowtama (Gowtama): BEL, with a vision of making India self-reliant, has been India's foremost defence electronics company since 1954. BEL is steadily increasing its portfolio in defence defence electronics. It has been the most trusted partner of DRDO and spends 8 per cent to 9 per cent of its turnover on R&D. It has strengthened the armed forces (Indian Navy, Indian Air Force as well as Indian Army) with many indigenous defence systems in the field of radars, communication systems, electronic warfare systems, weapon systems, night vision devices, etc.

Some of the systems already delivered include the various surveillance and weapon locating radars, Akash missile system, IFF radars, air defence control and reporting system (ADC&RS), combat management systems (CMS) and sonars for ships and submarines, ship-borne and land based EW Systems, communication equipment for Navy and Army, digital flight control computer (DFCC) and avionics for light combat aircraft (LCA), night vision devices, etc.

SP's: How does BEL contribute to the modernisation of armed forces? What are the latest products in defence and aerospace category?
Gowtama: Modernisation of armed forces happens through induction of state-of-the-art equipment and upgrading sensors and weapons on existing platforms. BEL is contributing in both these areas. Today BEL is working on many new products such as AESA based modern multi-mode radars, next-generation electronic warfare suites for fighter aircraft, integrated EW systems for various terrains/ships, tactical communication systems, battlefield management systems, passive night vision devices, multi-sensor stabilisation systems with sensors, and new gun programme with target acquisition and fire control capabilities. Also, BEL is providing upgrade solutions like for Schilka and L70 guns.

SP's: Please talk about the indigenisation efforts of BEL in line with the 'Make in India' programmes?
Gowtama: In line with the Government's 'Make in India' policy, BEL has taken several initiatives towards indigenisation to achieve self-reliance through in-house R&D, import substitution, outsourcing from Indian private industries, public private partnerships, joint ventures, capacity expansion, infrastructure development/modernisation and collaborative R&D. Around 87 per cent of BEL's turnover is generated through indigenously developed products/systems. As part of our efforts to enhance indigenisation, BEL has created an exclusive web link on 'Make in India' in the BEL website (www.bel-india.com).

SP's: Could you shed some light about your vision and priorities for BEL to achieve its objectives?
Gowtama: Defence segment continues to be BEL's main business and provides about 85 per cent of revenues. BEL's vision is to be a world-class enterprise in professional electronics. In keeping with the modernisation plans of the Indian defence forces, BEL aims to grow at a rate of 12 per cent to 15 per cent in the coming years.

Segments like network-centric warfare, radars, weapon systems, electronic warfare and avionics, military communications and electro-optics are likely to largely drive the Company's growth in the future.

As a diversification strategy, BEL is continuously exploring opportunities in defence and allied non-defence areas for enhanced growth, leveraging its strengths and capabilities acquired in the defence electronics domain. Some of the new areas of focus in defence segment include electronic ammunition fuzes, inertial navigation systems and in non-defence segment include homeland security and smart city solutions. BEL is also working with ISRO to address growing needs in satellites and space applications.

India is one of the most lucrative defence markets globally with mega acquisition programmes coupled with the Government's firm resolve for defence modernisation. At present, the Indian defence market is undergoing several fundamental changes with the Government setting a firm platform for the private sector to play a major role in the Indian defence industry. BEL is poised to face increased challenges due to competition from the private sector. BEL is working closely with platform manufacturers like HAL and OFB to become a preferred electronics systems supplier for their programmes.

AKASH MISSILE SYSTEM

BEL has been continuously carrying out changes in its organisational structure, business processes and systems to adapt to the changing business requirements. BEL is planning to invest substantially in R&D and also for expansion and modernisation of facilities especially in areas of radars, missile systems, advanced electro-optics, antennas manufacturing, RF and microwave components and homeland security solutions.

SP's: How do you look at Defexpo 2018 as a platform to identify new business opportunities? Could you talk about BEL's highlights at the expo?
Gowtama: Defexpo 2018 is a wonderful platform to interact with existing and potential customers, partners and suppliers. At Defexpo 2018, BEL will showcase its capabilities spanning every domain of its business – radar and fire control Ssystems, network-centric systems, communication systems, missile systems, electronic warfare and avionics, anti-submarine warfare 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 launching some of its new products/technologies during the Defexpo 2018. The theme for this year's display is 'Make in India' in keeping with the Government's impetus on this initiative. •

Apache's state-of-the-art facility has been inaugurated

- Hyderabad facility will be sole producer of AH-64 Apache helicopter fuselages globally
- Delivery of the first fuselage expected in 2018
- Partnership reaffirms commitment to 'Make in India'

By **SP's CORRESPONDENT**

Tata Boeing Aerospace Limited (TBAL), a joint venture between Boeing and Tata Advanced Systems Ltd (TASL) inaugurated its state-of-the-art facility on March 1, 2018, in Hyderabad. Spread over 14,000-square metres and employing 350 highly skilled workers, the facility will be the sole global producer of fuselages for AH-64 Apache helicopter delivered by Boeing to its global customers including the US Army. The facility will also produce secondary structures and vertical spar boxes of this multi-role combat helicopter. The delivery of the first fuselage is expected in 2018.

"I congratulate Tata and Boeing for taking this bold step towards Make in India and making this substantial investment in the defence space," said Nirmala Sitharaman, Minister of Defence, Government of India. "The manufacturing of advanced defence platforms and being integrated with the complex global supply chain will help our aerospace industry acquire technology, build local capability, provide employment and become a global exporter."

TBAL, Boeing's first equity joint venture in India, is the result of a 2015 partnership agreement with TASL. Construction of the manufacturing facility began in 2016 and was completed on schedule. In addition, Boeing and TASL have worked closely to develop a pool of highly skilled aerospace talent through skill development initiatives.

"TBAL is just the beginning of Boeing's future journey of partnership with India," said Pratyush Kumar, President, Boeing India. He further added, "As we progress, we see this as a major step towards future opportunities to pursue the co-development of integrated systems in aerospace and defence. Our partnership with Indian industry fulfils the goals of the 'Make in India' initiative and results in mutual growth and productivity growth for both India and Boeing."

"Tata is a significant player in the global aerospace market focused on leveraging opportunities in global markets and reducing India's reliance on imports in defence related requirements, 60% of which is met through imports. With the streamlining of the export regulation process under the Strategy for Defence Exports (SDE) of the Government of India, and with established capabilities and demonstrated deliveries, we are poised to emerge as a supplier of choice for global OEMs," said Mr. Banmali Agrawala, President, Infrastructure, Defence and Aerospace, Tata Sons.

Sukaran Singh, MD and CEO, Tata Advanced Systems said, "The inauguration of the TBAL facility marks an important milestone in our collaborative engineering journey with Boeing. As India focuses on indigenous manufacturing in the defence market, this partnership is testimony to Tata Group's commitment to develop global high-end technology in defence manufacturing, making India more self-reliant."

TASL, the strategic aerospace and defence arm of the Tata Group, is a key player in the global aerospace and defence market. With established capabilities throughout the aerospace value chain from design to full aircraft assembly, it is a premier manufacturing partner for global original equipment manufacturers (OEMs) as well as the Government of India's Defence Research and Development Organisation (DRDO).

More than 2,300 Boeing-made Apache helicopters are operated by customers around the world since the aircraft entered production. The United States Army Apache fleet alone has accumulated more than 4.3 million flight hours, including more than 1.2 million in combat, as of January 2018. The helicopter has been fielded or selected for acquisition by the armed forces of 16 countries, including India.

Boeing is expanding its engagement with India's Ministry of Defence (MoD) to deliver advanced capabilities and readiness to the Indian military. The company has developed a competitive supplier base in-country that is integrated into Boeing's global supply chain. MoD finalised an order with Boeing for 22 AH-64E Apache helicopters in September 2015, deliveries for which are scheduled to begin in 2019.

In less than a decade, TASL has become a significant player in the global aerospace market, becoming the premier manufacturing partner for global OEMs, including Boeing, Airbus Group, Sikorsky Aircraft Corporation, Lockheed Martin Aeronautics, Pilatus Aircraft Ltd, Cobham Mission Equipment, as well as India's DRDO. •

DEFENCE MINISTER NIRMALA SITHARAMAN, RATAN N. TATA, CHAIRMAN EMERITUS, TATA SONS AND PRATYUSH KUMAR, PRESIDENT, BOEING INDIA, AT THE INAUGURATION OF THE TATA BOEING AEROSPACE STATE-OF-THE-ART APACHE FUSELAGE FACILITY IN HYDERABAD

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.*

ShinMaywa

Brighten Your Future

ShinMaywa Industries India Private Ltd.
Flat No. 1010,1011 and 1012, 10th Floor, Narain Manzil
23, Barakhamba Road, New Delhi –110001
URL http://www.shinmaywa.co.jp E-mail air.sales@shinmaywa.co.jp