

Asia's biggest airshow kicks off with a bang!

The fourteenth edition of Aero India kickstarted yesterday with some great surprises that included the arrival of Lockheed Martin F-35A "Lightning II" as well as the revealing of HAL's HLFT-42. Another pleasant surprise was at the India Pavillion where a full-scale LCA Tejas aircraft in Full Operational Capability (FOC) configuration was at the centre-stage.

Prime Minister Mr. Narendra Modi while inaugurating the event stated, "India will take rapid strides to be included

among the largest defence manufacturing countries and our private sector plus investors will play a big role in that."



Big USAF/USN presence at Yelahanka



All photos above: Abhishek S Chauhan

Dassault Aviation at Yelahanka



The Dassault Aviation group is particularly happy to be able to present its dual military and civil know-how here at Aero India. In the defence sector, the Indian Air Force (IAF) is our longest standing export customer and has been flying Dassault aircraft since 1953. The acquisition contract for 36 Rafale, signed in 2016, and the modernisation of the Mirage 2000 I/TI are a continuation of this historic partnership. In the business aviation field, more than twenty Falcon aircraft are in service in India and growth prospects are promising.

Following the Rafale contract, Dassault Aviation and its partners are also contributing to the “Make in India” policy, through a vast procurement, training and industrial subcontracting network involving dozens of companies, in accordance with our offset obligations.

Dassault Aviation is presenting the following at the Show:

- ➔ A Rafale C mock-up in Indian Air Force colors and a Rafale Marine mock-up.
- ➔ A Falcon 2000 front section built by the Franco-Indian plant in Nagpur, under agreements signed subsequent to the Rafale contract.
- ➔ A Falcon 8X.

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The ePlane Company: Democratise Flying in India

Among the several engrossing visions being brought to major trade shows like that of Aero India, one such in this edition is the concept of “Flying Taxi” by IIT Madras based The ePlane Company. Founded in 2019, the company has unveiled its e200 flying taxi concept which aims to be cheaper than standard taxi in India while also being a trustworthy solution for timely intra-city travel with 160 kmph of cruise speed. According to Vishnu Ramakrishnan, from the founder’s office of the ePlane Company, he has confirmed that a sub-scale prototype is undergoing testing with positive results so far and they are looking to conduct the maiden flight test of the 1:1 prototype likely by the end of 2023. The production variant will be fully electric and feature a two-seat configuration, accommodating one passenger and a pilot. (Reporting by Rishav)



Visit them at Hall A Booth 7.1

Garuda Aerospace: Update on the Vajra



Visit Garuda Aerospace at Hall A

Chennai-based Garuda Aerospace, which unveiled its flying wing concept last year has shared details regarding the current state of the Vajra project. A wind-tunnel model is already undergoing various simulation trials and the company expects to conduct the first flight of a battery-operated prototype in August-September 2023. However, the later prototypes and the production model will feature a powerplant currently being developed by HAL. Garuda Aerospace has stated that the primary purpose of this Unmanned Aerial Vehicle (UAV) will be surveillance, however, an internal weapon bay can be featured in case the user demands a combat-spec variant. Lockheed Martin will be providing support for setting Ground Control System (GCS), and Sony is reportedly in consideration for supplying EO sensors. However, major other critical systems are already being developed in-house. (Reporting by Rishav)

Elbit Systems at Aero India

Elbit Systems is participating here at Yelahanka with both visual and interactive displays of their solutions. “Elbit Systems is a trusted partner of the Indian Ministry of Defence and the Indian Armed Forces, with a technological legacy of close to 70 years and is well known for its groundbreaking military solutions that have supported dramatic changes on the battlefield”, stated company officials.

“We are presenting a range of defence and military solutions that address current and emerging operational needs with cutting edge technology at our stall located in Hall C, Stand 7.6 as well as at the stalls of our local partners and JVs.”



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LCA-N/MiG-29K lands on IAC R11

A historical milestone was achieved by the Indian Navy pilots on 6 February 2023 as they carried out a landing of LCA (Navy) and MiG-29K on the IAC Vikrant (R11). “This Demonstrates India’s capability to design, develop, construct and operate Indigenous Aircraft Carrier with indigenous fighter aircraft LCA-N”, according to the Navy spokesperson.



HAL Helicopter Factory at Tumakuru dedicated to the Nation



Prime Minister Narendra Modi dedicated to the nation Hindustan Aeronautics Limited (HAL) Helicopter Factory at Tumakuru in Karnataka on 6 February 2023. He took a walkthrough of the Helicopter Facility and Structure Hangar and unveiled the Light Utility Helicopter (LUH). The factory is India’s largest helicopter manufacturing facility and will initially produce LUHs. Initially, this factory will produce around 30 helicopters per year and can be enhanced to 60 and then 90 per year in a phased manner. (Full story in tomorrow’s edition of the Show Daily)

SASMOS signs contract with Boeing

Bengaluru-based SASMOS HET Technologies has signed a manufacturing contract with Boeing Commercial Airplanes (BCA) to supply Electrical panels, Shelf Assemblies and Electrical wiring systems for Boeing 767 and 767-2C aircraft.

As part of this agreement, SASMOS will manufacture and export 238 types of parts and assemblies, including Shelf assemblies, Panels assemblies, Sensor assemblies and Wire bundles for the Boeing 767 and Boeing 767-2C aircraft. The production will begin early 2023 at the SASMOS manufacturing facility in Bengaluru. SASMOS won this order among other global players, which is “a testimony of the capabilities of Indian aerospace companies to deliver global standards in quality, reliability and project management”.





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IAI showcases latest defence solutions at Aero India

Israel Aerospace Industries (IAI) is showcasing its advanced technologies, air-defence systems and ground-combat solutions (in Booths 5.1 & 5.2, Hall F) here at Aero India 2023. IAI is leading a strategic transformation to provide fast direct access to IAI's solutions in full support of India's Atmanirbhar Bharat vision of a self-reliant country. IAI will sign several Memorandums of Understanding (MoUs) and joint venture agreements during the exhibition as it deepens its ties with the local defence sector.



Boaz Levy, IAI President and CEO: "We are very excited to be back for Aero India, which brings together some of our leading partners in the defence sector. We have been working closely with the Indian defence industry for more than 30 years and we look forward to further collaboration following the exhibition. We look forward to meeting our friends and partners while exhibiting our cutting-edge technologies to the Indian, Asian and global markets during this distinguished exhibition."

IAI is showcasing a wide array of aerial systems, including its Medium Altitude Long Endurance (MALE) strategic Unmanned Aerial Systems (UAS) Heron TP. IAI's advanced tactical loitering-munitions are designed for both ground and naval units, the Mini Harpy and

the Rotem. In addition, IAI is exhibiting an advanced GEO Mini Communication Satellite, whose development is based on IAI's long heritage and the Dror 1, Israel's National Communication Satellite- MCS. IAI's Rampage-supersonic, long-range accurate air-ground assault rocket for the annihilation of high-quality targets. The Scorpius G is a ground-based EW system designed to detect and disrupt ground and airborne threats. Aerial Refueling Tanker for the supply of Aerial Refueling and strategic transport aircraft. IAI's HAROP is on display in Adani's booth and the LORA and MRSAM are on display in the BEL booth.



DRDO's new 125mm round on the horizon

DRDO is developing a new generation 125mm Armour-piercing fin-stabilised discarding sabot (APFSDS) with a long rod kinetic energy (KE) penetrator for T-90 Bhisma tank of the Indian Army. As the Bhisma itself is going through extensive modernisation to meet future threats, it's necessary to enhance the firepower, protection, mobility and situational awareness. In accordance with the modernisation, DRDO has initiated two simultaneous projects to develop newer APFSDS. According to the DRDO official present at Aero India 2023, the future KE round will have a penetrator of 750mm. However, first a round with a 600mm long penetrator will be developed to validate all necessary newer technology before moving to a much ambitious one. Along with a new gun will come the new KE round to defeat future threats. (Reporting by Sankalan Chattopadhyay)

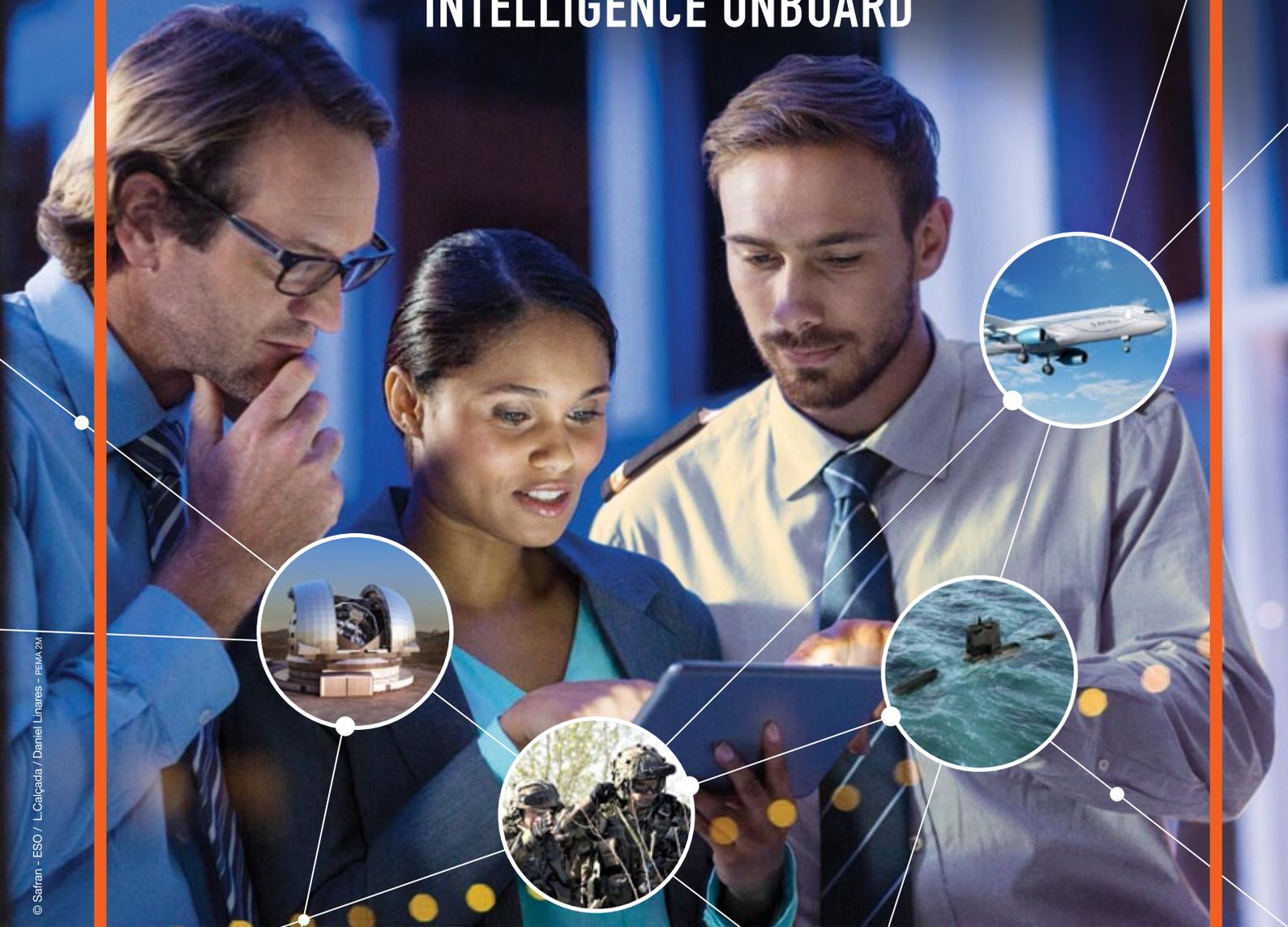


125mm Mk.I

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Safran Data Systems in HAL order for VS1510 recorders for Tejas MK-1A



LCA Tejas Mk.1 (photo for representational purpose)

Safran Data Systems has received an order from HAL for VS1510 recorders for its upcoming Tejas MK-1A. The recorders will equip all Mk.1A's in the future. The ENERTEC VS1410/VS1510 airborne recorders/servers submit the uncompressed digitised motion imagery to either ISO MPEG2 or ITU H-264 video compression algorithm. Either ISO MPEG2 or ITU H-264 video compression algorithm is implemented in FPGA components, which provides considerable advantage over “commercially-available” ASIC’s in terms of system design flexibility, where specific operational requirements involve non-standard video formats or video processing/distribution capability (scan conversion, text overlay, etc.), obsolescence management and product support,



the average lifetime of “commercially-available” ASIC’s hardly exceeding two-four years.

The ENERTEC VS1410/VS1510 airborne recorders/servers can be configured to handle the SC145C-series removable memory module (RMM) fitted with encrypted solid-state devices. Selection of “encryption enabled” or “encryption disabled” mode is operated on the ground, with the SC145C RMM connected to the host PC, using Safran Data Systems-supplied dedicated utilities - all data stored on the RMM is encrypted using a strong AES-256 XTS encryption algorithm - the encryption key is provided via Ethernet and stored in volatile memory. Access to the RMM requires prior upload of encryption key after power up.

The ENERTEC VS1410/VS1510 airborne recorders/servers provide field/mission data acquisition, processing, storage, exploitation and dissemination, for on board operation manned or unmanned ground, air and sea vehicles. These products and solutions are submitted to extensive validation and formal qualification testing, per standard test methods (DO-160, MIL-STD-810).

Post-flight data download and replay can be operated by direct connection of the SC1450 removable memory module (RMM) to the eSATA or USB 3.0 port of the PC host platform, using the Safran Data Systems-supplied DS2120-14 RMM interface module. When operating with IRIG 106 Chapter 10 recording format, dedicated utilities are required. Safran Data Systems can propose a Ground Replay Software package that allows easy installation and user-friendly operation in the PC/Windows environment, for video, audio and data playback and display, and for basic RMM management.



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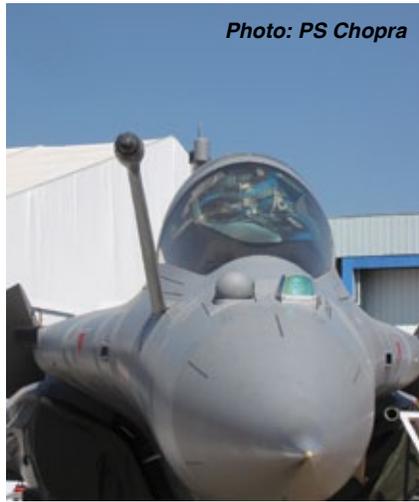


SAAB

Great 2022 for Dassault Aviation Group

Aircraft ordered and delivered in 2022: 92 export Rafale were ordered (80 United Arab Emirates, 6 Greece, 6 Indonesia), compared to 49 (37 Export and 12 France) in 2021. 64 Falcons were ordered, compared to 51 in 2021. 14 Rafale's (13 Export and 1 France) were delivered, while 13 had been guided plus 25 Export Rafale's were delivered in 2021. 32 Falcon's were delivered, while 35 deliveries had been guided (30 Falcon's were delivered in 2021).

Backlog: As of 31 December 2022, the backlog included 164 Rafale's



compared to 86 Rafale's as of 31 December and 87 Falcon's compared to 55 Falcon's as of 31 December 2021.

With over 10,000 military and civil aircraft (including 2,500 Falcons) delivered in more than 90 countries over the last century, Dassault Aviation has built up expertise recognised worldwide in the design, development, sale and support of all types of aircraft, ranging from the Rafale fighter, to the high-end Falcon family of business jets, military drones and space systems. In 2021, Dassault Aviation reported revenues of €7.2 billion. The company has 12,400 employees.





MiG-35

The MiG-35 multi-role fighter is designated to destroy aerial targets around-the-clock under clear and adverse weather conditions and to engage mobile and stationary ground (sea-surface) targets.

THE TECHNOLOGY OF FLIGHT

Lockheed Martin's 9th Annual Suppliers' Conference



Lockheed Martin announced the culmination of its 9th annual Suppliers Conference held in Bengaluru on 9 November 2022. The company reiterated its commitment to enhancing indigenous defence capabilities of the Indian industry to boost the government's mission of increasing 'Made in India' defence exports.

The two-day event saw more than 60 Indian companies of all sizes large, MSMEs and start-ups participating in the conference and receiving the opportunity to showcase their capabilities to all four business areas of Lockheed Martin and international partners like GE Aviation, Honeywell, L3Harris Technologies, Raytheon Technologies, Thales and Elbit Systems among others. More than 250 delegates attended the event and over 100 business to business meetings were organised to explore partnership opportunities.

Mr. Basavaraj Somappa Bommai, Chief Minister of Karnataka graced the event as the chief guest for the inaugural ceremony. The Chief Minister's address focused on the vast talent and incentives that the state of Karnataka had to offer to fulfil India's mission of being 'Atmanirbhar' in defence. Key representatives from state governments besides industry leaders spoke at the event to reinforce their commitment to develop a defence and aerospace ecosystem in India.

"Lockheed Martin, in association with our Indian partners, continues to promote an indigenous defence manufacturing ecosystem in India, in line with Prime Minister Narendra Modi's resounding vision of achieving \$5 billion worth of defence exports by 2025," stated William L. Blair, chief executive, Lockheed Martin India.

"We are excited to explore further opportunities to strengthen our presence in India and advance India's strategic security and industrial capabilities," Blair said.



William L. Blair, chief executive, Lockheed Martin India Pvt. Ltd

"We saw an encouraging response from our supply chain network, MSMEs, start-ups and the industry who engaged in productive conversations focused on realising the government's vision of 'Make in India, Make for the World.'"

Hindustan Aeronautics Limited (HAL) was recognised as an Outstanding Supplier by the Lockheed Martin Rotary and Mission Systems (RMS) Global Supply Chain Organisation and India Multi-Role Helicopter (MRH) team for outstanding support, dedication and commitment to the success of the India MRH Programme. HAL demonstrated outstanding customer focus through delivery of the first two indigenous Identify Friend or Foe Transponder units and became the first Indian supplier to provide Buyer Nominated Equipment for integration on the India MRH platform.

Another Indian manufacturer, SASMOS HET

Technologies was recognised as an Outstanding Supplier by the Lockheed Martin RMS and Missiles and Fire Control Global Supply Chain Organisations and the programme teams for their commitment to the success of the Aegis Low Noise Amplifier (LNA) and Hellfire programmes. During the past two years, while working smartly and safely through the pandemic, SASMOS delivered over 18,000 assemblies, demonstrating an outstanding customer focused approach while meeting or exceeding requirements.

The event reiterated Lockheed Martin's resolve to develop the capabilities of suppliers and to give them access to the global supply chain to manufacture in India, for India and for the world. Post the conference, Lockheed Martin Supply chain teams visited more than 25 suppliers across India to assess their capabilities and establish alliances.

Courtesy: LM

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Brahmos remains at the forefront of 'Make-In-India' and 'Make-for-the-World'



By signing the historic export contract with the Republic of Philippines in January this year to deliver world's fastest and deadliest supersonic cruise missile Brahmos to the Armed Forces of Philippines, BrahMos Aerospace has charted a new frontier to fulfil New Delhi's 'Make-in-India' and 'Make-for-the-World' aspirations.

The Defence Joint Venture (JV) entity involving India's DRDO and Russia's NPOM has been manufacturing the state-of-the-art Brahmos Weapon System for the Indian Army, Navy and Air Force. The highly versatile Brahmos has been widely reckoned as the most powerful precision-guided system of 21st century owing to its supersonic speed, impeccable accuracy, complex manoeuvrability and deadly firepower to completely decimate high-value land and sea-based targets from stand-off ranges in all-weather conditions.

The multi-role, multi-platform Brahmos, since its maiden launch on 12 June 2001, has undergone numerous development trials and user practice trials from ground, sea and air platforms – thus establishing an unbeaten record having highest success rate.

Having been inducted in the Indian Navy as the 'prime strike weapon', Brahmos has immensely bolstered India's maritime might and outreach. Both the anti-ship and land-attack variants of the weapon are operational in the Navy.

Indian Army's artillery arm has raised several Brahmos land-attack cruise missile (LACM) regiments to safeguard India's frontline land border positions. The Indian Air Force (IAF) has also operationalised Brahmos LACM squadron.

On 20 January 2020, the IAF commissioned the formidable Tigersharks Squadron consisting the Sukhoi-30MKI fighter platform armed with the powerful Brahmos air-launched cruise missile (ALCM) system. It became the 'first-in-the-world' weapon-platform combination having a frontline fighter aircraft armed with a highly manoeuvrable supersonic cruise missile which made India the first and only country to complete the "supersonic cruise missile triad".

After charting innumerable milestones since its inception in February 1998, BrahMos Aerospace on 28 January 2022, achieved yet another historic feat when the JV entity signed an export contract with the Philippines to deliver shore-based Brahmos anti-ship weapon systems to the Armed Forces of Philippines.

"With this landmark export contract, the world-class Brahmos brought the first and foremost major breakthrough in India's military exports front and became the first full-scale weapon set for delivery to a responsible, friendly foreign customer nation," according to Mr. Atul Dinkar Rane, CEO & MD of India-Russia JV entity BrahMos.

The JV entity, meanwhile, has set its sight on the future and has started the work to design and develop more advanced variants of existing Brahmos, including Brahmos-NG. This futuristic next-generation (NG) missile variant with its smaller, lighter and smarter dimensions, promises to redefine the battlefields of tomorrow in a decisive way by being deployed onboard a wider number of modern land, naval and air platforms in higher numbers.

Brahmos-NG promises to emerge as yet another potential weapon of export, thereby further widening India's military exports horizon in the coming years.

Courtesy: Brahmos Aerospace



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HAL signs contract with Honeywell for HTT-40 engines



HAL has signed a contract worth over US\$100 million for supply and manufacture of 88 honeywell TPE331-12B engines/kits along with maintenance and support services to power the Hindustan Trainer Aircraft (HTT-40). “We are proud of our four decade long partnership with HAL and happy to extend our relationship with this new order,” stated Mr. Eric Walters, Senior Director OE Sales, Honeywell Defense & Space. “The TPE331-12 family of engines has proven itself in operations all over the world, and we have committed to support and deliver engines as well as kits within the stipulated schedule to meet the requirements of the IAF. Honeywell is committed to support export of HTT-40 aircraft in coming years along with other engine programmes which are currently on radar. This contract would pave the way for future collaboration between HAL and Honeywell”.

The TPE331-12B engine is a single shaft turboprop engine with integral inlet and gearbox, two stage centrifugal compressor, power turbine, gearbox, three stage axial turbine and turbine exhaust diffuser as well as EEC for reliable power and outstanding operational characteristics.

The HTT-40 prototypes are powered by TPE331-12B engines and has been serving well since 2014. Entering into this ‘Manufacturing & Repair license agreement for Honeywell TPE331-12B Turboprop engine’ marks a



major milestone in the execution of 70 HTT-40 aircraft contract with IAF. HAL is working closely with Honeywell for its support for export potential of HTT-40. HAL and Honeywell are exploring other areas such as 1MW Turbo Generators, manufacturing, Repair & Overhaul of TPE 331-10GP/12JR engines for variants of Dornier.

75
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HAL and Safran to develop new helicopter engines in JV



Hindustan Aeronautics Limited (HAL) and Safran Helicopter Engines have signed an agreement to create a new joint venture intended to develop helicopter engines. It will be dedicated to the development, production, sales and support of helicopter engines and one of its main objectives will be to meet the requirements of HAL and Ministry of Defence’s future helicopters, including the 13-ton IMRH (Indian Multi-Role Helicopter).

This MoU demonstrates once again the commitment of both Safran Helicopter Engines and HAL to the Indian Government’s vision of “Aatmanirbhar Bharat” or achieving self-reliance – particularly in defence technologies.

HAL CMD stated, “Safran Helicopter Engines has been our valued partner for several decades. We now look forward to utilise this opportunity to leverage HAL’s experience in manufacturing of more than 15 types of aircraft and helicopter engines to jointly co-develop and manufacture engine with immediate focus on IMRH and its naval variant the Deck Based Multi Role Helicopter (DBMRH). This partnership will involve and utilise the Indian defence manufacturing ecosystem within India”.

Mr. Franck Saudo stated, “The creation of this new joint venture marks a turning point in our relationship with HAL and the Indian MoD with the development and production of a new generation of helicopter engine. We are proud to further expand our structuring partnership with HAL, which began more than 50 years ago, and which was recently illustrated with the development and production of the Shakti engine and the inauguration of our joint venture



Helicopter Engines MRO Pvt Limited (HE-MRO). With a fleet of over 1,000 engines, India’s Armed Forces are one of the largest operators of Safran-designed helicopter engines”.

HAL and Safran Helicopter Engines have already multiple partnerships, including the Shakti engine, which powers HAL-produced helicopters, including the Dhruv, Rudra and the Light Combat Helicopter (LCH). The Ardiden 1U variant also powers the new Light Utility Helicopter (LUH). More than 500 Shakti engines have already been produced.

Through HE-MRO joint venture in Goa, HAL and Safran Helicopter Engines will also provide MRO (Maintenance, Repair and Overhaul) services for TM333 and Shakti engines in service with Indian Armed Forces. It will be operational by the end of 2023.

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Gripen E: Evolve every day



It's hard to imagine that the smartphone in your pocket has anything in common with the Gripen aircraft. However, they have more similarities between them than meets the eye.

Both rely on software technologies with built-in flexibility and adaptability. Technologies which can be effortlessly upgraded without a need for costly design and replacement efforts, allowing the product to evolve and be customised to meet any changing need of the user. This is a prerequisite for performance at optimal levels, to stay not only relevant, but to lead the way.

In the same way that you can download apps for your smartphone, with Gripen, software adaptations can be made to counter new and evolving threats. The ability to customise Gripen's systems has been made possible due to a new revolutionary design of the Avionics Platform Software (APS) and hardware architecture.

Compared with the smartphone, the Saab engineers has however taken this concept to a whole new level with Gripen E. The software is actually not dependent on what hardware it runs on, and vice versa. This means as computational power develops, new standard hardware can continuously and swiftly be installed without having to requalify the software. This in turn enables new advanced AI software that requires such computational powers to be introduced in a continuous synergistic spiral. Using the smartphone analogy would mean that you could change processor to unlock more powerful apps without having to buy a new phone.

Disruptive innovations and several years of hard work has gone into creating this unique form of avionics software and hardware structure. As technology becomes increasingly advanced, Gripen E evolves with it, in an ever changing process. By designing the avionics architecture in the Gripen to truly separate tactical system functions

from the flight critical, changes can be made very rapidly. At the same time, the Saab principle is to keep the software as generic as possible. By also using generic computers it becomes much easier to make the upgrade work. The separated avionics architecture in Gripen E is certified to the highest software assurance level. In software terms, this means that Gripen E is the most secure fighter system on the market.

Never obsolete, always available

The Gripen E avionics architecture enables the integration of tailor-made customer applications, and it removes risks of the system ever becoming obsolete. The flexible avionics also allows for ease of integration of virtually any weapon of any origin. And maybe best of all, this all means that Gripen E will never spend a lot of time on the ground for time consuming requalification of the entire aircraft, so it's available for the next mission quickly. This is of course absolutely critical in a war time scenario.

Since the first flight of Gripen E in June 2017, the software platform has been updated numerous times. In addition to upgrading the hardware and its performance, all of the Gripen E computer processors have also been updated. Thanks to the unique avionics core, these updates are done very rapidly; in a matter of days and sometimes in only a few hours, where no flight critical re-qualification needs to be done. As further artificial intelligence enhancements and machine learning capabilities are introduced, the system's tactical agility and adaptability ensure that these will be able to be incorporated with ease, and the Gripen fleet will be updated and ready for the next mission long before anyone else.



By Kent-Åke Molin, Head of Gripen for India Programme



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X-BAND LTCC T/R MODULE



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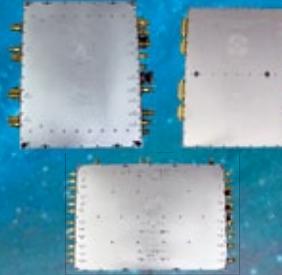


Ku-BAND LNA

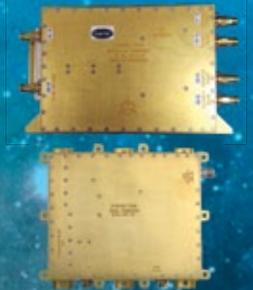


X-BAND SSPA

ELINT Payload



SAR Payload



Ground Applications

SUB-SYSTEMS FOR MULTI-OBJECT
TRACKING RADAR (MOTR)



L-BAND
T/R MODULE



MONOPULSE
COMPARATOR



ANTENNA



TRANSMIT/
RECEIVE (TRU) UNIT

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- | Antennas
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BEL showcases its capabilities at Yelahanka (Part 1)

At Aero India 2023, being held at Yelahanka Air Force Station, Bengaluru, from February 13-17, 2023, Bharat Electronics Limited (BEL) is showcasing state-of-the-art products and systems spanning every domain of its business.

The products and systems on display during Aero India 2023 have been clustered as 'Air Defence & Surveillance', 'C4I Systems', 'Artificial Intelligence-based Products', 'Non-Defence & Diversification Products', 'Radar Systems', 'Communication Systems', 'Airborne Products & Systems', 'Homeland Security and Cyber Security', 'Futuristic Technologies', 'Missile Systems', 'EO & Laser-based Products', and 'Outdoor Display Products'. In addition, BEL is also showcasing its R&D capabilities by launching/demonstrating some of its new products and technologies.

BEL's display in the area of 'Air Defence & Surveillance' includes Hexacopter, Tethered UAV, Swarm of UAVs, Robotic Surveillance, Shallow Water Remotely Operated Vehicle (ROV) and D4 Anti-drone Systems. The display in the area of 'C4I Systems' includes C4I technologies, Combat Management Systems and Navigational Consoles and that in the area of 'Artificial Intelligence-based Products' includes AI-based activity interference of air targets for situation awareness.

Also on show is the complete range of products and systems for 'Non-Defence & Diversification', including High Level Network Management in Advance Net Centric Operation, Virtual Reality for Rolling Stock Driver



*Mr Bhanu Prakash Srivastava,
CMD, BEL*

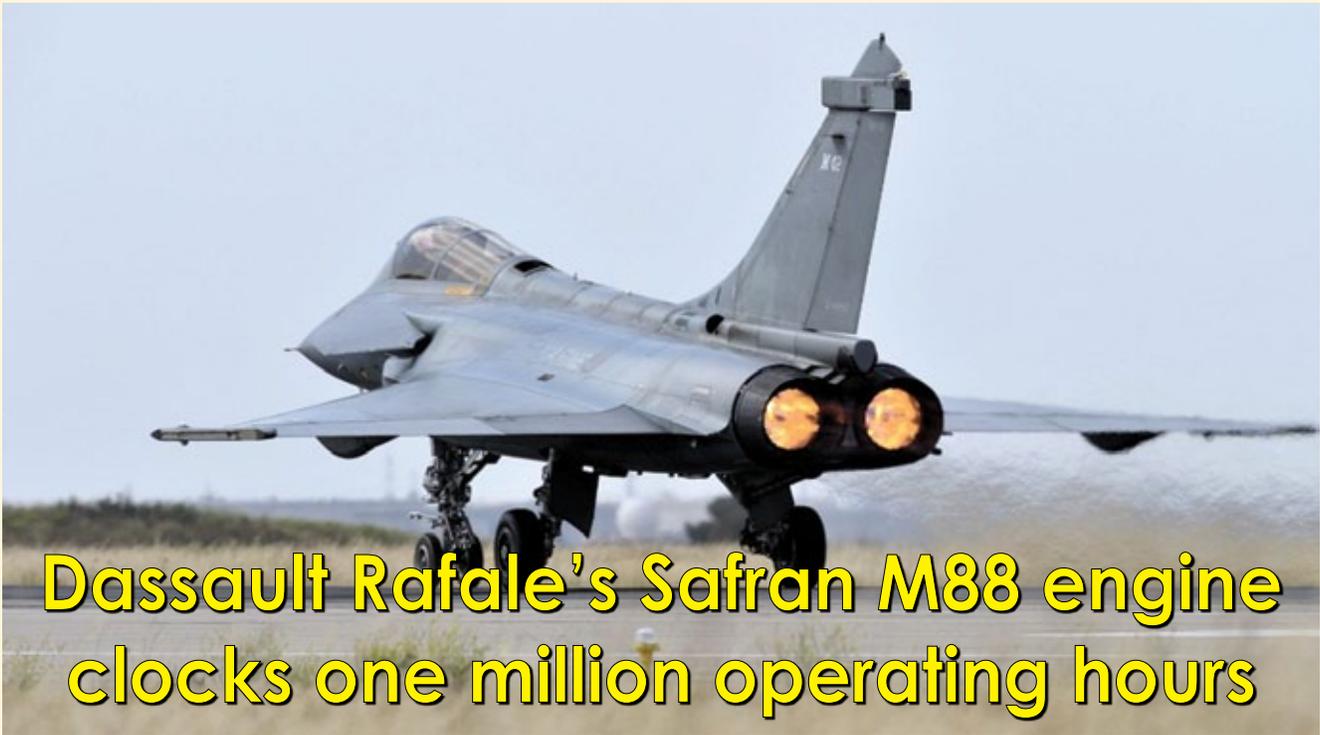
Training System, Air Traffic Management System for Civilian Airport, Advanced Surface Movement Guidance Control System, Super SCADA for Delhi Metro Rail Corporation, Virtual Reality-based Training Simulator, X-ray Baggage Inspection System, Explosive Detector, Automatic Chemical Agent Detector and Alarm, Fuel Cell, Electric Vehicle Batteries for two wheelers and three wheelers.

BEL is showcasing its 'Radar Systems' comprising Combined Interrogator and Transponder System, Battle Field Short

Range Active Electronically Scanned Array (BFSR-AESA) Radar, Frequency-modulated Continuous-wave based Drone Detection Radar, Air Defence Fire Control Radar, Close-in Weapon System, Mountain Fire Control Radar, Weapon Locating Radar, BFSR-XR, X-Band Multi-Function Radar, Battery Surveillance Radar, AESA Radar, and models of 3D Low Level Light Weight Surveillance Radar and 4D Phased Array Medium Power Radar.

BEL's display in the area of 'Communication Systems' includes Tactical Data Link, 0.76M Ku Band Manpack Terminal (manual assisted), Instant Fire Detection and Suppression System, Rugged Switches, Rugged Routers, Mine Field Recording System, Network Hardware Security Modules, Data Link Receiver Unit, High Capacity Radio Relay, Manpack High Frequency Software Defined Radio (SDR), Point-to-Multi-Point Radio, DSSS Networking Radio, SDR Airborne version, SDR Hand Held Naval version, SDR Manpack Naval version, SDR Naval Combat, SDR Tactical, Encryptor, Multi Capacity Encryption Unit, Data Multiplexer-cum-Encryption Unit, Configurable Live Mk-II, BEL Tactical Computer Mk-VI, Hardware Security Module, Rugged Tablet, Network Time Server and Data Diode.





M88 engine that powers Dassault Aviation's multirole fighter has clocked up more than one million operating hours. This major milestone is a testament to the operational excellence of the engine, which has been in service for more than two decades. More than 600 engines have been delivered since it was rolled out. The M88 entered service with the French armed forces in 2004 to power the Rafales used by the French Army and Navy. Designed, developed and produced entirely by Safran Aircraft Engines, the M88 engine has delivered the highest standards of performance and reliability, especially within the scope of external operations conducted by the French Army. Its outstanding capabilities have contributed to the large number of orders for the Rafale, France's military aircraft flagship and an emblem of our national sovereignty. To date, 284 aircraft have been sold to seven export customers: Egypt, Qatar, India, Greece, Croatia, United Arab Emirates and Indonesia.

Safran Aircraft Engines CEO Jean-Paul Alary stated, "Thanks to world-class performance, reliability and maintainability, the M88 is today Europe's most successful fighter engine. However, our mission doesn't stop here. We must continue to expand our production capacity to meet export demand, and at the same time work on upgrades to bring customers the benefits of the latest operational standards." To keep pace with orders, Safran Aircraft Engines will increase production rates three-fold in the next few years. This is an unprecedented industrial challenge, with more than 150 suppliers contributing to the military engine program, most of which are based in France. It will



help safeguard thousands of jobs, as well as French expertise and technology.

"The M88 programme is highly strategic in terms of maintaining skills not just for us but for the entire French aerospace industry," added Jean-Paul Alary. "It's partly thanks to our experience in military engines, for which we develop the hot section, among other things, that we've earned global recognition as a complete engine-maker." Safran Aircraft Engines is currently working on the F4 Standard of the M88, which will power the Rafale fleet deployed by France and the United Arab Emirates. This upgrade, slated to be rolled out in 2025, will provide even more onboard electronics for storing the growing volume of data required for integrated predictive maintenance.

Courtesy: Safran

Updates from IAI

German Heron TP (GHTP) awarded Type Certificate

The Type Certificate is the result of years of intensive type certification effort by the prime contractor Airbus DS Airborne Solutions GmbH (ADAS), a 100% Airbus subsidiary and its partner the GHTP OEM Israel Aerospace Industry (IAI) together with the GMAA. The Type certificate attests GHTP's compliance with the latest version of military airworthiness standard (STANAG 4671). The effort included adaptations of multiple systems to be



compliant with the required standards, compilation and review of hundreds of documents and multiple reviews and tests, in close cooperation between GMAA, ADAS and IAI. All this was performed, and brought to very successful conclusion, despite the challenges imposed by COVID-19 pandemic.

IAI in European permit to fly UAVs in civil airspace

On the recommendation of EASA, the European Union Aviation Safety Agency, the Greek civilian aviation authority has for the first time issued a permit allowing IAI's Heron 1 UAV to be flown in Greece's airspace. The permit allows the system to be used in the operational activities of the European



Border and Coast Guard Agency, whose charter is to provide marine surveillance and coastal protection. The UAV flights are carried out in Europe's civil airspace according to civil flight procedures with no military intervention or control.

The Heron 1 systems are equipped with electro-optical day and night-vision payloads and marine surveillance radars that provide an up-to-date, realtime, accurate intelligence picture. This information is then distributed to decision-makers in situation rooms by means of a specialised system that ensures the smooth coordination, planning, and command of the various tasks and assignments.

IAI electronic intelligence in tactical arena

Israel Aerospace Industries (IAI) has unveiled its latest Tactical Electronic Intelligence (ESM) system: TacSense (ELL-8395). TacSense delivers ESM performance in a compact form factor with minimal SWaP (size, weight and power). This allows TacSense to be deployed from a wide range of platforms including tactical ground vehicles and small UAVs. In addition, a manpack configuration enables the system to be easily carried on foot by one person, even in the most difficult terrain. The system's small size and weight also facilitate highly discreet, camouflaged installation at fixed locations.





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Updates from Israel Aerospace Industries

IAI unveils STAR-X 3D



Israel Aerospace Industries' (IAI) has unveiled the STAR-X 3D multi-mission naval radar, designed for Offshore Patrol Vessels (OPVs) and other small vessels. The STAR-X 3D naval radar is based on IAI's ELTA AESA (Active Electronic Scanned Array) technology. It performs simultaneous air and surface surveillance, and is designed for performing critical missions in Exclusive Economic Zones (EEZ) and beyond. The newest member of IAI family of operationally proven naval radars, which are in service with naval forces worldwide, the STAR-X is a fully digital, 3D, high-performance AESA radar which leverages proven technology from other IAI-ELTA radars.

IAI to provide special mission aircraft

Israel Aerospace Industries (IAI) has signed a contract valued at over \$200 million to provide Special Mission Aircraft to a country in Europe, which is a NATO member country. The Special Mission Aircraft will be developed by IAI's Group and subsidiary ELTA Systems Ltd., home to Israel's radar and intelligence technology. IAI's special mission aircraft are active in Israel and in many countries around the world, and provide an important strategic edge.



EASA approval for B737-800SF freighter conversion



Israel Aerospace Industries (IAI) has received the European Aviation Safety Authority (EASA) Supplemental Type Certificate (STC) for its B737-800SF passenger-to-freighter conversions. With the EASA STC approval, IAI will open its B737-800BDSF cargo conversions to European companies and operators, providing a solution to the rising demand for aircraft conversions worldwide. The first two converted aircraft for which this approval will apply have already been delivered to a customer in Spain with an additional aircraft undergoing conversion and joining the European fleet shortly.

IAI selected by Dassault to produce Falcon 10X surfaces

Israel Aerospace Industries (IAI) has been selected by Dassault Aviation to design and produce the all-composite wing movable surfaces for the new, long range Falcon 10X business jet. The Falcon 10X wing movable surfaces programme joins IAI's other aerostructures programmes for other leading aircraft manufacturers.



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Rosoboronexport is the sole state company in Russia authorized to export the full range of defense and dual-use products, technologies and services. Rosoboronexport accounts for over 85% of Russia's annual arms sales and maintains military-technical cooperation with over 100 countries worldwide.

DRDO's Fuel Cell-based AIP system progresses

The Fuel Cell-based Air Independent Propulsion (AIP) system of DRDO's Naval Materials Research Laboratory (NMRL) will soon be fitted onboard INS Kalvari. An agreement was signed between senior officials of NMRL and Naval Group France in Mumbai on 23 January 2023 to extend cooperation to enter into the detailed design phase for integration of indigenous AIP in the Kalvari class submarines. As part of the agreement, Naval Group France will certify the AIP design for integration in the submarines.

The AIP has a force multiplier effect on lethality of a diesel electric submarine as it enhances the submerged endurance by several folds. It has merits in performance compared to other technologies and is unique as the hydrogen is generated onboard. This technology has been successfully developed by NMRL with the support of Indian industry partners. The technology has now reached the stage of maturity for industrialisation.

It is worth mentioning that the land-based prototype of the NMRL's AIP has been tested successfully. This new endeavour will be a significant step towards the detailed design certification of the energy module, which will be performed by NMRL along with Indian industry and



design of the platforms impacted by the integration of the indigenous AIP inside the Indian submarine by Naval Group. These actions will seamlessly lead the way to start of localisation and industrialisation of AIP including the hull fabrication by the Indian industry for future fitment on-board the submarines.

Raksha Mantri complimented DRDO, Indian Navy and MDL for taking Aatmanirbhar Bharat initiative forward in underwater domain. Secretary Department of Defence R&D and Chairman DRDO Dr Samir V Kamat also congratulated NMRL, Indian Navy, MDL and Naval Group France for this strategic partnership.

Dassault Falcon 10X interior in Product Design Award

Dassault Aviation's latest addition to its large-cabin business jet family, the ultra long-range Falcon 10X, has received the Chicago Athenaeum award for Good Design. "These and other awards received by our rapidly expanding fleet are eloquent testimony to the unparalleled design and engineering prowess possessed by our company," stated Chairman and CEO Eric Trappier. "No other business jet OEM is capable of blending leading-edge aircraft technologies, particularly in the realm of flight aerodynamics and digital flight control, with the most innovative and creative features of interior design."

The award, bestowed by the Chicago-based Museum of Architecture and Design in cooperation with the European Centre for Architecture Art Design and Urban Studies, is the second in the past year to be received for the 10X's innovative interior design. The 10X, currently in development, will be the largest purpose-built business jet on the market. The aircraft's 2,780 cubic feet cabin will offer "unique blend of spaciousness, quiet and physical comfort while offering the only modular design of any jet in its category. With the help of sensory design, interior lighting, sound dampening and other advanced interior design techniques, the cabin seeks to make passengers forget they are even airborne, as if they were in a penthouse in the sky."



DRDO's strategic and tactical weapon systems



Defence Research and Development Organisation (DRDO) displayed a wide range of 430 products encompassing the strategic and tactical weapon systems, defence equipment and technologies at Defexpo 22. It showcased the advancements in technologies made by its laboratories as well as its partnerships with the industry, in recent years while representing a high level of indigenously advanced and futuristic defence products and technologies that contribute towards Aatmanirbharta in defence.

The venue for DRDO Pavilion was Hall No. 10 of Helipad Exhibition Centre. It was segmented in 17 display zones of various classes including Immersive Zones and Experience Zones to showcase 376 products. These 17 zones were namely Engines & Propulsion, Aerospace & Aeronautics (UAVs, fighter aircraft, aircraft for surveillance etc.), Sensors, Devices & Advanced Electronics, Naval Weapons & Systems (EW systems and Sensors), Armoured Vehicles & Land Systems, Armament,

Guns & Ammunition, Materials, Missiles (Cruise, MBRLs, AAM, ATGM & MRSAM), BrahMos, Industry Partners in R&D (17 Partners-3 Start-ups & 14 MSMEs), Soldier Support and Dual Use Technologies (Soldier support, LS products, Fire protection, Firefighting, Fuel & Energy, Food products etc.), Experience Zone (Simulator, Virtual Reality and Audio-Visual), Software AI & Cyber, Academic Zone, Academic Outreach, Industry Outreach and Public Interface.

Over a sprawling 1200 sq mtr outdoor display, 18 Outdoor static exhibits (actual products) were put on display





DRDO presented live demos as well as static displays of equipment at the Sabarmati River Front. 5 Live demo of DRDO equipment were put on display namely – Portable Diver Detection Sonar (PDDS) with Electro Optic System (EOS), Imaging Sonar ‘CHITR’, Autonomous Survey Vehicle – Inland, Autonomous Survey Vehicle -Coastal (ASV- Coastal) and Weapon Mounted Surface Vehicle. Whereas 6 static displays of DRDO equipment presented were AIR Independent Propulsion System, Virtual Reality based counter measure deployment simulator, TAL Torpedo, Portable Diver Detection Sonar, Wet End Unit,



at the Helipad Exhibition Centre. These included Border Surveillance System (BOSS), Laser Fence System (LFS), IRDE Tableau, BrahMos Air Version Missile, Mobile Autonomous Launcher (MAL) for BrahMos, CBRN Water Purification System, Infantry Combat Vehicle with Composite Hull (CICV), Advanced Composites Modular Bridge System (ACMBS), 155mmX52 Cal Advanced Towed Artillery Gun System (ATAGS), CBRN Water Purification System, CBRN Recce Vehicles, 70 T Tank Transporter, Wheeled Armoured Platform (WhAP), Prahar Missile, Rudram III Missile, Quick reaction Surface to Air Missile (QRSAM), Medium Range Surface to Air Missile (MRSAM), Mounted Gun System (MSG) and Unmanned Ground Mobile Platform (UGMP).

Counter Drone System for IN – D4 Radar, Soft Kill System and Hard Kill System, and Passive IRSS Device.

And finally, the India Pavilion in the Helipad Exhibition Centre displayed a combined strength of DRDO along with public and private sectors. DRDO put its 22 products on static display. These high-value products were displayed in the form of actual products and will include – VIBHAV- Anti Tank Point Attack Munition, VISHAL- Anti Tank Bar Mine, PRACHAND- Anti Tank, 9 x 19 mm Machine Pistol- ASMI, Mine Field marking Equipment Mk II, Light Tank, Daksh Defuser, MBT Arjun Mk-1A, Light Machine Gun, Pralay, QRSAM, Carbine- 5.56x 45 mm, AIP System- Air Independent Propulsion, TAPAS, ASTRA Mk-I, LCA Mk2 amongst others.

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Bharat Forge taking big strides

Bharat Forge in MoU with General Atomics, USA

Bharat Forge Ltd. has signed a Memorandum of Understanding (MOU) with General Atomics, US, a global leader in the research, design, and manufacture of a diverse portfolio of electromagnetic and advanced power and energy technologies. Under the terms of the MOU, Bharat Forge and General Atomics' Electromagnetic Systems Group (GA-EMS) will collaborate for Lithium-Ion Battery System for naval platforms/submarines to address the requirements of Indian Navy. The parties have also agreed to partner with each other in the area of permanent magnet motors.

Speaking on the occasion, Mr. Baba Kalyani, Chairman Kalyani Group stated, "We have been relentlessly working towards bringing niche technologies in the country with the



aim of making Indian self-reliant in defence verticals. GA is a market leader for in-service Li-Ion Battery solutions for naval platforms/submarines and our partnership with General Atomics is a firm step in the direction to develop Make in India solutions for Indian Navy and setting up a strong defence technology and manufacturing vertical within India."

Kalyani Group's Mounting Artillery Gun System 8X8 HMV unveiled

Kalyani Group's MGS 8X8 HMV was unveiled at Defexpo by Dr. Samir V Kamat, Secretary R&D and Chairman Defence Research and Development Organization (DRDO). The MGS 8x8 is a 155mm/52cal Mounted Artillery Gun System, the only artillery gun in the world with the capability of firing from Zone 1 to Zone 7. With a diverse operating temperature range and capability to fire in extreme diverse weather conditions of - 4 to 45 degrees. The gun comes equipped with quick shoot and scoot capability with a high degree of accuracy and consistency. The 8x8 has a high chamber volume of 25 litres, with future provision of up gunning.



Mr. Baba Kalyani (CMD, Bharat Forge) with Dr. Samir V Kamat



Mr. Baba Kalyani (CMD, BFL) with Mr. Rajnath Singh



MBDA updates

PGZ and MBDA's Mala Narew



PGZ and its subsidiaries, PIT-RADWAR, JELCZ and WZU, working hand-in-hand with MBDA have been making rapid progress on the short-range air defence (SHORAD) solution, known as “Mala NAREW”, with the first two Polish iLaunchers of the system already in Poland undergoing integration and trials ahead of delivery to the customer. This project aims to deliver rapidly two SHORAD-class fire units equipped with CAMM missiles, integrated with SOLA radar stations and the Polish C2 system.

Nexter and MBDA present the new NARWHAL

The NARWHAL is a remotely operated 20mm naval turret that can be integrated just as easily onto small patrol boats as onto frigates. Equipped with state-of-the-art optronics, including a day/night sight and a laser range finder, it is effective at more than 2,000 metres thanks to its 20M621 gun. The NARWHAL is already a commercial success, in service with six different navies. To meet their needs and those of future customers, engineers are working to add new capabilities and options that enhance its operational effectiveness.

The NARWHAL turret is paired with a manual target designator: the Short Range Pointer (SRP), designed by the German firm Hensoldt. With this easy-to-use tool, an onboard operator can quickly designate a target to the NARWHAL by pointing a laser beam.



ASRAAM impresses in RAF's major missile training exercise

The UK's Royal Air Force (RAF) successfully conducted their largest ever mass firing of the MBDA ASRAAM missiles over the sea in the Hebrides Air Weapon Ranges. Over the space of 10 days, pilots from eight different squadrons successfully launched a total of 53 missiles at target drones. The Missile Practice Camp was the largest mass firing of ASRAAM from the Typhoon FGR4 and F-35B Lightning II. Typhoon pilots from 1(F), II(AC), 6 and IX(B) Squadrons based at RAF Lossiemouth, as well as from 3(F), and 41 Test & Evaluation Squadron at RAF Coningsby, worked with Lightnings from 207 and 617 Squadrons based at RAF Marham in the event.



Rosoboronexport started promoting 15 new Russian-made military products in 2022



Rosoboronexport (part of Rostec State Corporation) has added new Russian military products to its export catalog, expanding the range of weapons and military equipment promoted on the global market.

"In 2022, Rosoboronexport launched a global marketing campaign for 15 new military products developed and manufactured in Russia. Its export catalog was replenished with products for the Air Force, Navy, Ground Forces, Air Defence Forces as well as with UAV countermeasures. Market launch of new products significantly increases the competitiveness of Russian arms and strengthens the position of our country on the global market," stated Rosoboronexport Director General Alexander Mikheev. Among the long-awaited novelties are the Orlan-30 UAV, Ballista remote-controlled weapon station module, Chukavin sniper rifle, UAV countermeasures systems, new underwater weapons, communications equipment, training simulators, motor and armored vehicles.

New Russian equipment and weapons for which export permits have been issued will be presented by Rosoboronexport at international defence exhibitions, during meetings and negotiations with partners, and on fast-growing digital platforms. The company has agreements with most manufacturers to jointly promote products in foreign markets.

The Orlan-30 unmanned aerial vehicle system developed and manufactured by the Special Technology Centre is a further evolution of the Orlan-10 UAV, which is well known in the world market and has proved its capabilities in real combat conditions.

The Orlan-30 is intended for aerial reconnaissance, search, detection and recognition of objects in the visible or infrared range. In addition, when equipped with a mission payload, it provides target designation for precision-guided weapons for destroying fixed and moving targets day and at night.

The Ballista remote-controlled weapon station is designed for mounting on armoured personnel carriers. It is equipped with a 30-mm automatic cannon and a coaxial 7.62-mm machine gun as well as with two ATGMs. The station is fitted with a combined sight with a TV camera, thermal imager and laser rangefinder capable of detecting and identifying targets day and night. In addition, the Ballista is equipped with a back-up sight, which significantly increases its combat capabilities.

Besides, the promotion of the BMP-3 infantry fighting vehicle (IFV) with a new remote-controlled weapon station, developed by High Precision Systems holding company, has begun. The vehicle was unveiled as part of Rostec's exhibit at the Army 2022 International Military and Technical Forum.

The vehicle is equipped with a 100-mm gun/launcher, a 30-mm automatic cannon and a 7.62-mm machine gun. Owing to its powerful armament, the IFV is capable of providing fire support to infantry, including afloat, effectively engaging manpower, lightly armored targets like IFVs and APCs, tanks and other targets with enhanced protection, as well as low-speed air targets, including helicopters.

In 2022, Rosoboronexport added new drone countermeasures to its export catalog. Among others is the RB-504P-E electronic warfare system, which provides highly effective detection, identification, and direction finding of UAVs, as well as jamming of their navigation and control links.

Rosoboronexport has started promoting modern simulators developed by Rostec's subsidiaries for training the crews of the IL-78MK-90A tanker aircraft and the IL-76MD-90A(E) military transport aircraft. In addition, the company got the opportunity to offer foreign partners a new automated artillery fire control system, a radio signal monitoring system, a heliborne ground surveillance radar system, K-5350 motor vehicle with a protected cabin, Podlet-K1KE radar station, communications equipment and small arms.

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Lockheed Martin reaffirms commitment to 'For India, From India, For the World'

Lockheed Martin is showcasing its vast range of advanced defence capabilities and solutions at the 14th biennial edition of Aero India taking place in Bengaluru. The company's exhibit this year showcases its most innovative capabilities on offer to the Indian Armed Forces including the F-21 fighter aircraft, C-130J transport aircraft, MH-60R "Romeo" multi-mission helicopter, JAVELIN Weapon System, and S-92 multi-role helicopter among others.

"We are excited to participate at Aero India 2023 to showcase our advanced capabilities and address our customers' biggest challenges for the 21st Century. Our participation will be focused on engaging with our customers while creating opportunities for the local industry to feed into the global supply chain and manufacture in India, for India and for the world," stated William (Bill) Blair, Chief Executive, Lockheed Martin India Private Limited. "We continue to strengthen and grow



William (Bill) Blair, Chief Executive, Lockheed Martin India Pvt Ltd

our presence and partnerships in India for strategic security and greater self-reliance in the defence sector. We have a high degree of confidence in the manufacturing and technical capabilities of the Indian industry which is reflected through our two joint ventures and multiple associations with public and private companies of all sizes including MSMEs."

The prime attraction at the Lockheed Martin booth is the F-21 fighter aircraft cockpit demonstrator that is available for defence and aerospace customers and partners to "fly" the jet for themselves, experiencing its unmatched performance. The F-21 fighter aircraft, which is on offer to the Indian Air Force (IAF) for the Multi-Role Fighter Aircraft

competition, is configured with the latest sensors and mission avionic systems that couple onboard and off-board data information into an effective, easy to manage combat situation display.



a variety of missions. India also is connected to the C-130J through Tata Lockheed Martin Aerostructures Limited, a joint venture, that has the distinction of being the single-global source of C-130J empennage assemblies included on all new Super Hercules aircraft. All C-130Js now built have major components manufactured in India.

Lockheed Martin continues to build upon more than seven decades of association and three decades of partnerships with India by nurturing and expanding collaborations with local industry to support the foundation of indigenous defence manufacturing ecosystem. The



The Indian Navy's most recent rotary wing acquisition, MH-60R "Romeo" SEAHAWK helicopter, occupies a prominent place at Lockheed Martin's Aero India display. The MH-60R is the most capable and mature Anti-Submarine (ASW)/Anti-Surface Warfare (ASuW) multi-mission helicopter available in the world today. The first three MH-60R helicopters were delivered to India in 2021 and are being utilised to train Indian pilots and crew members in the US. In July/August 2022, the Indian Navy accepted the delivery of another three helicopters at Kochi International Airport and they will be initially based at Naval Air Station INS Garuda in Kochi. A total of 24 MH-60Rs will be delivered in country over the next few years.

The world's most versatile one-man portable and platform-employed anti-tank precision weapon system, JAVELIN is also part of Lockheed Martin's exhibit at Aero India. Using "fire-and-forget" technology, the weapon guides itself to the target, allowing soldiers and platform assets to reposition out of harm's way once the missile is fired.

Boosting Lockheed Martin's presence at the show is the C-130J Super Hercules aircraft and the S-92 multi-role helicopter, both of which represent a strong legacy of partnership with the Indian defence industry. The Indian Air Force operates 12 C-130Js, using the tactical airlifter for



company's present and future programmes in India range from transport, maritime and fighter aircraft, to sea and land-based air and missile defence projects, as well as capabilities in civil sectors including new and renewable energy.

Courtesy: LM

Lockheed Martin is at Hall A5.1

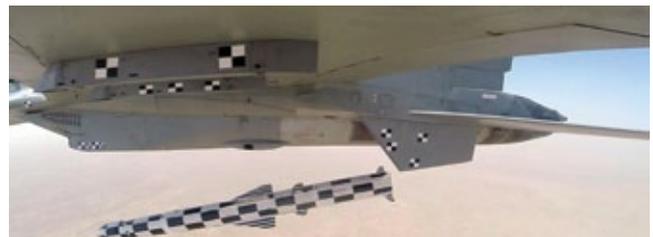


Successful firing of Su-30MKI launched Brahmos-ER



The extended range capability of the missile coupled with the high performance of the Su-30MKI aircraft gives the IAF a strategic reach and allows it to dominate the future battle fields.

(File photos courtesy IAF)



India, successfully fired the Extended Range version of BrahMos air launched missile from Su-30 MKI fighter aircraft. The launch from the aircraft was as planned and the missile achieved a direct hit on the designated target in the Bay of Bengal region.

It was the first launch of Extended Range version of BrahMos missile from Su-30MKI aircraft. With this, the IAF has achieved the capability to carry out precision strikes from Su-30MKI aircraft against a land/sea target over very long ranges. The dedicated and synergetic efforts of the IAF, Indian Navy, DRDO, BAPL and HAL have proven the capability of the nation to achieve this feat.



VAYU Interview with Alain Garcia, VP, India Business Development, Boeing Defense, Space & Security and Global Services

VAYU: With a strong focus from the Indian government on building an Aatmanirbhar Bharat strategy for aerospace and defence, how does the Super Hornet Block III support this vision?

Boeing plans to further strengthen its Make in India initiatives, building on a successful track record of contributing to India's indigenous aerospace and defence ecosystem. As part of this effort, Boeing anticipates \$3.6 billion in economic impact to the Indian aerospace and defence industry over the next 10 years, with the F/A-18 Super Hornet as India's next carrier-based fighter. The economic impact would be over and above Boeing's current offset obligations and plans in the country. The strategy includes five key pillars:

Supply Chain Development and Manufacturing: The new plan builds on Boeing's sourcing of \$1 billion annually from 300+ suppliers on parts, assemblies and services from Indian suppliers. Boeing has added several new Micro, Small and Medium Enterprises (MSMEs) suppliers in support of our commitment to Aatmanirbhar Bharat, and they account for over 25 percent of our suppliers in India. The plan also envisages potential for additional manufacturing opportunities, including the F/A-18's Outer Wing and Nose Barrel component manufacturing and assembly. Additionally, Boeing is reviewing several hundred other machined assemblies that could be placed with Indian suppliers.

Engineering and Technology Transfer: Boeing envisions working closely with industry and the US and Indian governments to share technology and transfer work of the F/A-18 fighter jets in India, based on interest and business case. Boeing will also leverage investments made in the Boeing India Engineering & Technology Center (BIETC) and its talented pool of 4,500+ engineers and innovators in Bengaluru and Chennai to drive growth and innovation, and advance work in materials, manufacturing technologies and methods, and the "Digital World." As a part of "Digital World," new manufacturing processes have been established, and Boeing has unlocked the potential of the Full-Size Determinant Assembly (FSDA) approach for its customers. With the F/A-18, Boeing will continue to explore opportunities to bring FSDA-related advanced technologies to the Indian defence industry.

Support and training: Boeing will collaborate with the Ministry of Defence and Indian industry to develop long-term and self-reliant sustainment solutions for the Super Hornet fleet to deliver increased aircraft availability



and mission readiness. This will be done by leveraging the existing industry ecosystem across key support areas such as On and Off Aircraft Maintenance, Sustaining Engineering, Fleet Operations Support, and Training, and by leveraging the local Maintenance Repair & Overhaul (MRO) capabilities that Boeing Defence India is building.

Investments: Boeing India employs over 5,000 employees directly, and over 13,000 are employed through over 300 suppliers in India. Boeing's joint venture with Tata - Tata Boeing Aerospace Limited - manufactures aerostructures for Apache attack helicopters for global customers out of Hyderabad. This campus will be the largest Boeing-owned facility of its kind outside the US.

Impact by Hornet Industry Team: The diversity and strength of the Hornet Industry Team, comprising of General Electric, Northrop Grumman and Raytheon, has the potential to deliver significant benefits to Indian industry. These industry leaders have proven their commitment to India by collaborating with Indian entities and delivering on Aatmanirbhar Bharat objectives. The



F/A-18 will enhance collaboration with Indian industry by facilitating knowledge transfer and promoting autonomy in operating and maintaining India's fleet of F/A-18 aircraft. Further, this knowledge transfer may also provide opportunities for India to support F/A-18 fleets around the world through manufacturing and sustainment.



VAYU : *What is the update on the six Apaches which the Indian Army had ordered?*

On 19 January, we completed the delivery of the first fuselage for the Indian Army's six AH-64 Apache attack helicopters from our JV facility Tata Boeing Aerospace Limited (TBAL) in Hyderabad. Spread over 14,000 sq. m., this state-of-the-art facility with over 900 engineers and technicians, it demonstrates co-development of integrated systems in aerospace and defence in India. An example of Boeing's commitment towards Make in India and Aatmanirbhar Bharat. The TBAL facility manufactures aero-structures for Boeing's AH-64 Apache helicopter, including fuselages, secondary structures, and vertical spar boxes for customers worldwide, including for the



US Army. As of January 2023, more than 190 fuselages have been delivered by TBAL. Recently, we added a new production line at TBAL to manufacture complex vertical fin structures for the 737 family of airplanes, a significant milestone for the joint venture.

VAYU : *Boeing's P-8I and C-17 platforms have been actively leveraged by the Indian defence forces. How does Boeing support the maintenance and upkeep of these platforms to support mission readiness of the armed forces?*

Earlier in December 2022, we completed a decade since the first P-8I was delivered to the Indian Navy. This is a significant milestone in our growing relationship with the navy. Notably, the Indian Navy was also the first international customer for the P-8 and today operates one of the largest non-US fleet. Since the induction of the P-8I in the Indian Navy, Boeing has been supporting the fleet to ensure high rates of mission readiness. The 12 P-8Is in the Indian Navy's arsenal significantly contribute to the Indian Navy's capacity to keep the vast areas of interest in the Indo-Pacific under surveillance – while also playing a greater role in regional maritime security. The patrol aircraft is an integral part of the Indian Navy's fleet and has surpassed 35,000 flight hours since it was inducted. In addition to unmatched maritime reconnaissance and anti-submarine warfare capabilities, the P-8I has been deployed to assist

during disaster relief and humanitarian missions. We believe there is a need for long-range maritime surveillance and ASW requirements in the Indian Ocean Region and the Indian Navy may have a requirement for more P-8Is and also more Harpoons and we stand ready to support them.

We continue to support the Indian Navy's P-8I fleet through Boeing's services business - providing spares, ground support equipment, and by positioning field service representatives at INS Rajali and INS Hansa so they are available to the Navy on 24x7x365 basis. Boeing's integrated logistics support has helped the Navy attain the highest state of fleet-readiness. Boeing has built a 60,000 sq. ft. Training Support & Data Handling (TSDH) Centre at INS Rajali, Arakkonam in Tamil Nadu as part of a training and support package contract signed in 2019. The facility was handed over to the Indian Navy, and the trainings commenced in April 2022. The secondary centre at the Naval Institute of Aeronautical Technology, Kochi was also handed over to the Indian Navy last year. The indigenous, ground-based training will allow the Indian Navy crew to increase mission proficiency in a shorter time, while reducing the on-aircraft training time resulting in increased aircraft availability for mission tasking.

Boeing India's strategic collaboration with Air Works was an important first step under the Boeing India Repair Development and Sustainment (BIRDS) hub that envisions a collaboration with key local companies and businesses to develop India into an aviation and defence repair and sustainment hub. They have successfully concluded Phase 32 maintenance checks on six P-8I long-range maritime patrol and anti-submarine warfare aircraft operated by the Indian Navy (IN) so far. Three of them were in heavy maintenance checks concurrently, demonstrating a maturity and scale at par with developed global MRO hubs.

We support the Indian Air Force C-17 fleet under the Globemaster Integrated Support Programme (GISP) that maintains high mission capability rates by providing them access to an extensive support network for parts availability and economies of scale. Boeing provides comprehensive C-17 Globemaster III training solutions for aircrews and loadmasters with advanced simulation, courseware and computer-based training. C-17 operators can practice the complete range of tasks required for tactical military airlift operations and humanitarian missions, along with mission rehearsal of all scenarios including emergency procedures. Boeing's in-country C-17 training center has completed thousands of training hours for aircrews and loadmasters.

VAYU : *The Indian Air Force (IAF) had reportedly earlier indicated a requirement for additional Chinooks, update us on how the discussions are progressing?*

Boeing stands ready to support the India Air Force for any additional Chinooks required, in addition to the 15 already delivered. The Indian Air Force is best suited to confirm their procurement plans.

Saab news

New lightweight torpedo for Sweden

Saab has made the first deliveries of the new lightweight torpedo (Saab Lightweight Torpedo) to Sweden's defence procurement agency FMV. Saab Lightweight Torpedo, named Torped 47 by the Swedish Armed Forces, is Sweden's new lightweight torpedo system for defence against foreign submarines. The torpedo is intended primarily for Swedish submarines and Visby corvettes, but it is also prepared for integration on helicopters. FMV is now undertaking final verification of the torpedo system to ensure it meets their requirements, before commissioning with the Royal Swedish Navy.



Order for Double Eagle SAROV from Poland



Saab has received an order for deliveries of additional underwater vehicles called Double Eagle SAROV (Semi-Autonomous Remotely Operated Vehicle); these are to be used for safe disposing of sea mines. Deliveries of the Double Eagle systems are scheduled with those of new vessels to the Polish Navy during 2026-2027. The Double Eagle SAROV systems are to be carried on the Polish Navy's three new minehunter vessels known as the Kormoran II- class, who will deploy and operate them.

Saab 340B(F) cargo aircraft for IBC Airways

The aircraft, serial numbers 340B-224 and 340B-274, are the first of an ongoing multi-aircraft commitment between Jetstream and IBC, which will result in IBC eventually retiring its fleet of Saab 340A freighters in favor



of the more advanced 340B. The aircraft will operate within the airline's scheduled cargo network within the Caribbean.

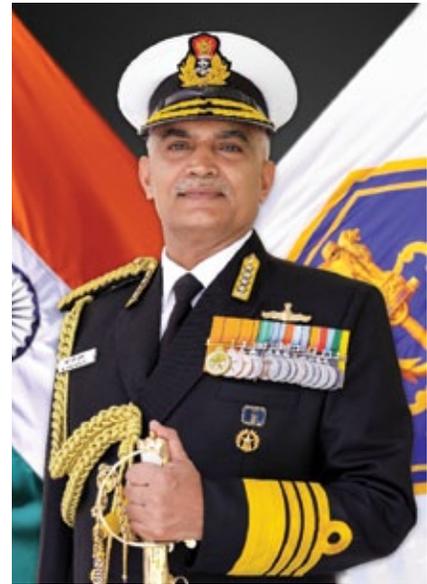
Two SIGINT ships for Poland

Saab has signed a contract with the Polish State Treasury Armament Agency for design, production and support of two ships for Signal Intelligence (SIGINT) for Poland. The total order value corresponds to approximately EUR 620 million with deliveries planned during 2027. The order is expected to be booked by Saab before year end.



VAYU Interview with

**Admiral R. Hari Kumar,
 Chief of Naval Staff, Indian Navy**



Reference photo of the Sea Guardian (Photo: GA-ASI)

VAYU: What kind of missiles is the IN acquiring for its surface fleet?

Ans. Surface fleet would be augmented with indigenous Surface to Surface missiles and Surface to Air missiles under production. A comprehensive design and development programme for State of the art missile systems is underway and future ships will be equipped with these missiles.

VAYU : There has been talk on the Indian Navy at some point ordering/ inducting the IMRH helicopter from HAL as of now called the DBMRH. Is this true and what is the roadmap?

Ans. In keeping with the Make in India and AatmaNirbhar Bharat Vision of the Government, a case for design and development of Medium Lift Helicopter (MLH) of 12.5 to 14 T category is being progressed for Indian Defence Forces. This caters for requirement of Medium Lift Helicopters for IAF/ IA and Multi Role Helicopters for Indian Navy.

The case would be progressed under Buy (Indian-IDD) categorisation with Special Purpose Vehicle wherein HAL along with suitable private player(s) would undertake design and development of envisaged variants of IMRH and DBMRH.



The case is at pre-AoN stage wherein requisite provisions are being incorporated in DAP 2020 to execute the Government's mission to achieve self-reliance in defence products. Design and development process is expected to take about 7 to 8 years to enable realisation of the platform commencing from ninth year of project sanction.

DBMRH for Indian Navy would be in three variants, viz, ASW/ ASuW, Special Ops and AEW.

VAYU: A question you have been asked numerous times: how are the trials going on for the IAC aircraft plans, ie Rafale and F-18?

Ans. Rafale M and F/A 18 have completed the Op Demo at SBTF, Goa in Jan 22 and Jun 22 respectively towards verifying that the aircraft meet IN requirements as well as compatibility with the aircraft carriers. Staff Evaluation of both the aircraft is under deliberation. Post finalisation of the selection of the aircraft, an intergovernmental procurement process would be followed in accordance with the Defence Acquisition Procedure.

VAYU: Can you tell us how useful have the General Atomic's UAS been for the Indian Navy ISR needs and are you satisfied enough to order more or lease more?

Ans. Though IN has been operating RPAs for the last two decades, operations of Sea Guardian has greatly enhanced our surveillance capabilities. Sea Guardian RPA has enabled IN to increase surveillance activities over vast areas of Indian Ocean region ranging from Sunda Strait to Gulf of Aden. The high endurance of the aircraft has enabled IN to maintain persistent surveillance over larger areas.

IN's experience with leased operations of Sea Guardian has been good and therefore, IN is actively pursuing a case for procurement of these aircraft.



VAYU: *As for the MH60R, on which class of warships are these to be deployed? Would the 24 ordered be enough?*

Ans. MH-60R would cater for the Air ASW/ASV requirements of the fleet. The helicopters would be primarily based on ships of frigate size and above. In addition, these helicopters would also be employed for operational tasks from ashore at naval bases.

IN is also progressing a case for development of indigenous Deck Based Multi-role Helicopter (DBMRH) through HAL for operations from ships in the near future. These aircraft would be capable of undertaking Airborne Early Warning, Anti Surface/ Anti-submarine warfare as well as Special Ops roles. These platforms would be the mainstay of Naval Aviation in the near future.

VAYU: *In brief, can you tell us about the Indian Navy warship Acquisition plans?*

Ans. Indian Navy is evolving continuously to meet emerging challenges to our maritime interests. The modernisation programme of IN is centered on Aatmanirbharta which defines India's growth story. Threats, missions, capability development and affordability have, remained dominant factors in the force structure planning of the Service. The expansion plan in future includes induction of aircraft carriers, state-of-the-art Next Generation Warships, nuclear powered and conventional submarines, revitalisation of aviation and sub-surface assets, augmentation of unmanned solutions to enhance combat capabilities, and induction of niche technology and equipment to address emergent and future threats. Further,

development of technical and support infrastructure for maintenance of these new inductions is also being progressed. In consonance with the GoI initiative of 'Make in India', 43 out of 45 ships and submarines presently on order are being constructed in Indian Public and Private Shipyards. Further, AoN has been accorded for acquisition of 49 ships and six submarines all to be constructed indigenously in Indian Shipyards.



Nammo's drone-mounted M72



Nammo has for several years been working on a concept where the M72 is mounted on a drone. The result is a flexible and powerful anti-vehicle or anti-tank weapon that can be operated remotely; the company is pleased to announce that they are working on a drone-mounted M72 concept. The M72 is a 66mm caliber single use light anti-tank weapon effective against a range of targets such as armoured vehicles, personnel, lightly fortified structures, or similar.

The M72 is qualified and in use by a wide range of armed forces in several (mostly NATO) countries and offers a good combination of low weight and heavy firepower. In a regular usage scenario, it is fired from the shoulder of the operator. While most variants have a maximum effective range around 350 meters, the new drone concept opens up several new possibilities for versatile use and much longer ranges. With the M72 mounted on a drone, users can bring the weapon to the target in a way not previously possible. This opens up both a "top attack" option against more heavily armoured targets, even up to main battle tanks, while at the same time removing operators from the danger zone.

The M72 drone concept is also a low-cost concept that does not rely on GPS or similar to function. With a degree of automation, the number of operators can be kept at a reasonable level, and the light anti-tank weapon/drone combination can likely operate in so-called swarms. Compared to conventional anti-tank missiles, this can be an effective and inexpensive solution against armoured forces. M72 variants meant to be used against armoured targets can penetrate at least 450mm of steel. Currently

the company is looking at using existing and commercially available drones. Since there is no or very little recoil from the weapon, it is an ideal combination within a range of 3 to 4 kilometers.

All photos from Eurosatory 2022



Lockheed Martin and Rafael to collaborate on HELWS



Lockheed Martin and Rafael Advanced Defense Systems Ltd of Israel have signed a teaming agreement that includes jointly developing, testing and manufacturing a High Energy Laser Weapon Systems (HELWS) in the US and Israel. The future joint-development will be based on the assets that have been developed independently by Rafael and the Ministry of Defence's Directorate of Defence Research and Development (DDR&D) within the framework of the IRON BEAM project. The cooperation will be geared towards developing a variant of the system for the American market as well as others.

After years of joint development by the Ministry of Defence's Directorate of Defence Research and Development (DDR&D) and Rafael, the IRON BEAM project was initiated by the DDR&D. In the last year, a series of tests on the system was carried out that proved the operational capability of the system. IRON BEAM is a 100kW-class HELWS, expected to be the first-ever operational system for ground-based air defence against threats such as rockets, mortars and UAV's, delivering engagement at the speed of light.

Rafael CEO and President Maj. Gen. (Ret.) Yoav Har-Even stated, "This strategic teaming agreement serves as a force multiplier for Rafael



and the Israeli market. We are working to ensure our customers receive the most advanced, effective, and best in class systems. This agreement will expand and diversify the capabilities we can offer to a variety of customers."

Lockheed Martin Chief Operating Officer, Frank St. John stated, "Lockheed Martin's mission is to deliver the best security solutions that help our customers stay ahead of their adversaries. Working with Rafael, our joint team will help bring this new, life-saving capability to our customers. This unique capability will enhance Israel's vital air and missile defence system with state-of-the-art laser technology, and we are honoured by the opportunity to expand Lockheed Martin's role as a security teammate for the State of Israel."



Updates from Rafael

Rafael's FOOTPRINT

As part of the Army Warfighting Experiment (AWE), ground troops of the British Army conducted a set of rigorous trials with the Rafael's FOOTPRINT system through varying scenarios. The system proved its ability to allow soldiers to navigate and self-position in situations

where they are unable to rely on traditional GPS capabilities. As part of AWE and under The Defence Science and Technology Laboratory (DSTL) and the Future Capability Group, the British soldiers tested FOOTPRINT system in scenarios simulating modern mission requirements, including between and inside buildings, down into basements as well as in open areas.



Drone Dome recommended by US DoD

The US Department of Defence's (DoD) Joint Counter-small Unmanned Aircraft Systems Office (JCO) has named and recommended for C-sUAS As A Service (CaaS) the DRONE DOME system, provided via Rafael Systems Global Sustainment (RSGS). This is following a series of demonstrations of the system completed at Yuma Proving Ground, Arizona. DRONE DOME successfully demonstrated its C-UAS capabilities, which included accurate detection, identification and soft-kill capabilities against a variety of drone targets and is now eligible and has been recommended to compete for future CaaS contract opportunities.



Rafael contract for Typhoon Mk30-C

Rafael Advanced Defense Systems Ltd. announced it has been awarded a contract to supply its Typhoon Mk30-C, counter-UAS, Next Generation Naval Remote Weapon Station (NRWS) to an undisclosed navy in Asia. The contract is worth tens of millions of dollars and will be fulfilled over the course of five years, with an option for expansion for more systems over the course of the contract. Equipped with the highly-reliable NGC Mk44S Bushmaster 30 mm gun and its advanced ammunition, the Typhoon Mk30-C offers a superior capability in defending against multiple threats.



Saab awarded Indian contract for AT4 support weapon

Saab's AT4 weapon has been selected by the Indian Armed Forces through a competitive programme for a single-shot weapon. AT4 will be used by the Indian Army and the Indian Air Force.

The Indian Armed Forces are a new customer for AT4. This order includes the AT4CS AST, which can be fired from confined spaces such as from inside buildings, bunkers and other urban environments. The AT4CS AST offers a tandem warhead with a breach or blast mode, which is optimised to defeat enemies within buildings and to destroy structures, which can create a point of access into them.

The contract was signed by FFV Ordnance AB, responsible for Saab's Ground Combat offer in India.

"We are honoured that the Indian Armed Forces, which are already users of our Carl-Gustaf system, have also selected Saab for their single-shot weapon need. The Indian Army and Indian Air Force can be confident in the knowledge that they have the necessary firepower to give them the advantage," stated Görgen Johansson, Head of Saab's business area Dynamics.

AT4 is one of the most popular and successful support weapon families on the market. Operated by a single soldier, this single-shot system has proven efficacy against structures, landing craft, helicopters, armoured vehicles and personnel. Its 84 mm calibre warhead offers enhanced power and performance.

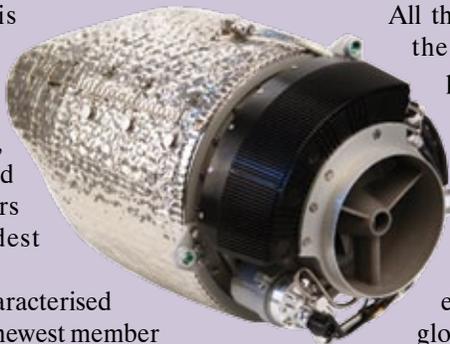


PBS India's PBS TJ80-120 turbojet engine

PBS India Private Limited is an Indian manufacturing company, part of PBS Group, a Czech engineering manufacturer that operates globally in aerospace, precision casting, cryogenics and energy. With more than 200 years of history, it belongs to the oldest engineering brands in the world.

The PBS TJ80 engine family is characterised by high development potential. The newest member of the PBS TJ80 engine family is the PBS TJ80-120 turbojet engine. The globally leading Thrust-to-Weight ratio makes the PBS TJ80-120 the world's most efficient gas turbine engine on today's market.

PBS India is offering its TJ80 programme in various modifications which have different technical specifications ranges and engine features. The specification range includes up to 2250 W of el. power delivered to the onboard systems, flight envelope enhanced to more than 32,000 ft and maximum starting altitude of almost 20,000 ft. The features of the engine programme include the possibility of salt water recovery, very short start sequence and in-flight restart.



All the key features highlighted above make the TJ80-120 the perfect fit for various platforms including Class 3 Unmanned Aerial Systems (UAS), Single Use Applications (Cruise Missiles, Anti-ship Missiles, PGMs, Missile Guidance Kits) or Aerial Targets.

PBS India Pvt Ltd is an Indian company, part of PBS Group, a Czech engineering manufacturer that operates globally in aerospace, precision casting, cryogenics and energy. With more than 200 years of history, it belongs to the oldest engineering brands in the world.

**More information at the PBS India Booth,
Hall B Booth BS5.10**



Big milestone for HAL and Safran HE

HAL handed over 500th indigenously manufactured Shakti engine to the Indian Army on 1 February 2023. The Shakti 1H1 engine was co-developed by Safran HE, France and HAL and has been designed to provide additional thrust to the Advanced Light Helicopter to enhance the operational envelope from 3 km to 5 km altitude. A de-rated version of Shakti1H1 engine (Shakti1U engine) will power the Light Utility Helicopter.



News from Thales

France orders 21 more TALIOS optronic pods



The French defence procurement agency (DGA) has placed a firm order with Thales for 21 additional TALIOS pods. The new target designation pods will equip Rafale aircraft currently in service with the French Air and Space Force and the French Navy. This order for 21 additional pods underscores the continuing confidence of the French forces, which have deployed TALIOS multiple times on expeditionary missions since the first pods were delivered in 2019. The new pods will be delivered between 2024 and 2025, straight after fulfilment of the initial order for 46 TALIOS systems.

Thales completes acquisition of RUAG S&T

Thales has completed the acquisition of RUAG Simulation & Training including its 500 employees and with sales worth approximately €90 million in 2021. The consolidation will complement Thales's footprint in the land market in particular, meanwhile sustaining its field-proven expertise in helicopters and military aircraft solutions. This acquisition will provide an opportunity to reinforce local footprint in priority geographies (France, Switzerland, Germany, and United Kingdom), while increasing presence in UAE and Australia.



PARADE drone countermeasures system

Thales and partners in France and Europe's defence industrial and technological base are developing the PARADE capability to provide deployable protection from drone threats. The contract was awarded after a European competitive tendering process launched by the DGA in 2021 to strengthen the drone countermeasures (counter-UAV) capabilities of the armed forces.

The first order calls for the acquisition of six PARADE drone countermeasures systems. With contributions from French SMEs such as CerbAir, Exavision and MC2 Technologies, as well as the Dutch company Robin, the PARADE system will provide decision support, analysis of complex situations and the capability to neutralise micro-drones and mini-drones. The contract also includes operator training and system and equipment maintenance and upgrades. The PARADE system provides permanent 360° site protection and is designed for easy transport from one site to another by road, air or sea, considerably increasing its scope of use and speed of deployment.



News from Thales

Thales partnership with Dassault



Thales has announced the expansion of its collaboration with Dassault Aviation through the signature of a maintenance agreement for electrical systems on Falcon 900 and Falcon 2000 Series Fleets. Through this agreement, Thales and Dassault Aviation will bring to Falcon operators unprecedented value for Premium Services along with significant reductions in Direct Maintenance Cost (DMC) and a robust incentive campaign for Starter Generators P/N 8060-160 upgrade to a new P/N 8060-170.

Thales launches VisioLoc

Thales is launching VisioLoc to improve the effectiveness of the augmented soldier without adding to the cognitive and physical burden on the warfighter. The new functionality for the Sophie family of multi-function thermal imagers provides a high-performance geolocation capability and generates precise target coordinates even when no GNSS1 signal is available.



Thales and partners present new Sherpa A2M

Thales, Arqus and NTGS have officially presented the new Sherpa A2M (Advanced Mobile Mortar). The Sherpa A2M is an adequate answer to the tactical challenges met and created by artillery in the high-intensity warfare: mobility, protection, close support to the troops on the ground and mobile counter-battery options at the fraction of the price of a Self-Propelled Gun (SPG). The Sherpa A2M combines the mobility of a Sherpa Light, the proven Deployable Mortar System by NTGS and the 120mm rifled mortar barrel by Thales, into one full fully integrated new solution.



Thales and the Combat Digital Platform



Thales is introducing the Combat Digital Platform, a cybersecure platform designed to share, analyse and exploit the vast quantities of available data to guarantee information superiority for the forces deployed in the theatre of operations.

ECIL and PGCIL in MoU



An MoU was signed between ECIL and PGCIL on 21 December 2022 for setting up Integrated Indigenous Information Security Operation Centre (I3-SOC) for PGCIL to safeguard their IT and OT infrastructure against any kind of cyber attacks. As per the MoU, ECIL needs to install and setup I3-SOC facility with the required IT hardware and indigenously developed cyber security tools along with deploying adequate number of trained security analysts to manage the PGCIL IT and OT infrastructure on 24/7 basis for a period of three years.

I3-SOC is a next generation, custom developed, prophylactic cybersecurity surveillance, threat detection and mitigation platform service built to safeguard all the service verticals of Powergrid, including ERP, IT, Telecom, NTAMC and substations against any kind of cyber attacks.

I3-SOC aims to solve these challenges: The need for indigenous Made-In-India security tools and technologies that is fully customisable and available bespoke as per the needs of the customer. Integrated enterprise-wide threat detection and response system that can seamlessly integrate security and log data of all the verticals. Continuous technology build up and augmentation to keep up with the evolving threat landscape. Deployment of the dedicated and specialised SOC resources and the availability of on-demand remote Subject Matter Experts (SMEs) for support within the agreed terms.

Salient Features of I3-SOC includes the following: Completely Made-in-India technology. 24 x 7 Eyes-on-the-glass Security Monitoring Subscription Service. In-house developed advanced monitoring technology with Endpoint Agents. Security Information and Event Management (SIEM) for log ingestion, correlation of events and analytics to proactively detect potential threats. Network and technology agnostic with the capability to integrate logs from multiple third party sources with deep parsing at source to reduce central EPS handling load. Advanced Intelligent Automation with built-in Security Orchestration, Automation and Response (SOAR) functionality, adaptable to AI/ML technologies etc.

Pratt & Whitney opens new India Engineering Centre



Pratt & Whitney, a Raytheon Technologies business, on 19 January 2023, officially opened the doors to its new India Engineering Centre (IEC) in Bengaluru. The facility is co-located with Pratt & Whitney's India Capabilities Centre (ICC), which opened in 2022 to provide integrated global supply chain support, and the recently inaugurated Collins Aerospace engineering and global operations centres. The IEC, which was designed to meet the LEED Platinum certification, further enhances Raytheon Technologies' combined presence in India of over 5,000 employees and facilitates collaboration across the company's businesses.

More than 50 employees are now based in the state-of-the-art facility, with an additional 450 jobs to be filled over the next four years. Work performed at the IEC will encompass elements such as aero and mechanical and control systems for various products in Pratt & Whitney's broad portfolio of large and small commercial engines. It will also extend across the entire product lifecycle from development to field support and sustainment.

"I am truly excited about the future of Pratt & Whitney in India, and the significant investments we are making towards building a stronger aerospace ecosystem in-country," stated Ashmita Sethi, Managing Director of UTCIPL. "Beyond the \$40M+ in financial investment in both the IEC and co-located India Capability Centre, we are collaborating with local universities and investing in emerging technology companies to further enhance India's homegrown capabilities."

Aircraft spotting!

Photos by Samarth Mahajan (Instagram @indian.spotter05)





Photos taken at IAF Day 2022 and Republic Day 2023

Aeronautics Unmanned Hover Plane (UHP) Trojan launched

Aeronautics Group, a leading provider of integrated solutions based on unmanned aerial systems, payloads and communications for defence and HLS applications, launched a brand new aviation category - the Unmanned Hover Plane (UHP). “The company is proud to introduce Trojan, a one-of-a-kind system, which bridges the gap between the need to hover and the need to reach long ranges. The new UHP category is a game changer, due to its ability to perform aerial missions with pinpoint precision” stated the company.



The system’s capabilities support challenging operational missions while simultaneously performing point-to-multipoint Intelligence, Surveillance and Reconnaissance (ISR), thereby creating a solution for versatile and dynamic environments, and achieving Wide-Area-Persistent-Surveillance (WAPS). The system’s multi-platform architecture utilises multiple sensors, together with advanced analytics capabilities, to ensure accurate, reliable, real-time situational awareness.



The revolutionary UHP configuration gives Trojan long endurance - 2.5-hour flight time, long-range - up to 150 km, and fast flight capabilities, combined with the capacity to carry multiple payloads up to 12 kg in weight, all packed into a small tactical platform. The system enables execution of demanding, complex missions by tactical base stations, each of which control up to four platforms, simultaneously. Each platform, in face of a



battle scenario can channel and produce sensor data which can optimise the mission’s performance.

Trojan has been designed to enable operations in harsh environments - characterised by adversary operations, day and night operational activity and extreme environmental conditions - while maintaining high efficacy within a small footprint.



The UHP’s Ground Control Station (GCS) is controlled via a user-friendly interface and can be safely operated by a single operator. Collecting field information, it supports mission planning and monitoring in all operational modes, and payload control.

“Aeronautics is proud to be a pioneer in the field of tactical UAS, and our latest innovative platform introduces a new category in the world of aviation, which will expand force capabilities in the field and create superiority in ISTAR missions,” stated Moshe Elazar, President & CEO of Aeronautics. “Trojan is the first ever Unmanned Hover Plane (UHP), and we are delighted to introduce its unique capabilities to the world in this 25th anniversary year of the company - an important milestone for us. Just as with our other winning systems, we are constantly developing new technologies to deal with evolving battlefield and HLS challenges.”

Thales and ‘Make in India’ strategy

Thales is present in full strength at the 14th edition of Aero India 2023, India’s flagship air show to showcase its cutting-edge technologies across Defence, Aerospace and Space, bringing a special focus on its progress towards ‘Make in India for India and for the world’. Celebrating its 70th anniversary in the country, Thales is moving forward on its Make in India roadmap as part of the Indian government’s Aatmanirbhar Bharat vision

At Aero India 2023, Thales is exhibiting its air defence capacities from sensors to effectors. As a systems integrator, the Group is showcasing its full range of radars as well as leading very short range air defence systems including Laser Beam Riding MANPAD, among others. The company is also showcasing the best of its airborne optronics capability: the 2-in-1 targeting and reconnaissance pod TALIOS (Targeting Long-range Identification Optronic System).

On the connectivity side, Thales is introducing SYNAPS A, the airborne member of the SYNAPS software-defined radio family designed to support battlespace digitisation and C4I systems, and also Identification Friend of Foe (IFF).



Rosoboronexport offers India new joint projects in aviation (Part-1)

Rosoboronexport (a unit of Rostec State Corporation) is the organiser of Russia’s collective display here at the Aero India 2023.

“Rosoboronexport is a permanent exhibitor at Aero India, one of the world’s largest air shows, where the Russian display traditionally stands out for its scale and the range of exhibited products for the Air and Air Defence Forces. The exhibition gives us an excellent opportunity to showcase modern Russian-made weaponry and discuss the areas for further bilateral cooperation with India,” stated Alexander A. Mikheev, Rosoboronexport Director General. “The military-technical cooperation between Russia and India is an example of industrial partnership with a number of completed and ongoing joint projects for all services of the armed forces. Today we are offering new points of cooperation within the joint development and production of high-tech products on the premises of Indian enterprises under the national Make in India programme in compliance with all localisation and technology transfer requirements.”

Rosoboronexport is exhibiting about 200 advanced Russian-made samples of armaments and military hardware, including the advanced Su-57E fifth-generation multifunctional fighter, the Checkmate light tactical aircraft, the IL-76MD-90A(E) military transport aircraft, the IL-78MK-90A tanker aircraft, the Su-35 and the Su-30SME super-maneuverable fighters, and the MiG-35D multifunctional frontline fighter.



Rolls-Royce: 'The right collaboration can accelerate India's defence programmes and build strategic capability'



Indigenisation in defence is critical for achieving self-reliance and developing capabilities within the country. India has already taken several steps towards the creation of a domestic defence manufacturing ecosystem with the support of the private sector and global partners.

The evolution of its indigenisation policy towards co-development and co-production in partnership with global companies has also provided the much-needed impetus to the growth of the local defence industry. With geopolitical and economic crises affecting world stability, a robust and self-reliant defence ecosystem will help develop India's strategic capability, boost manufacturing and exports as well as contribute to economic and security resilience.

While efforts in this direction have been significant, India can accelerate its progression towards critical technology development and ownership through programmes that will lead to the creation of technological capabilities within the country. This will ensure long-term benefits and opportunities for further customisation and exports.

The Indian government's goal of achieving true self-reliance will actually be realised through end-to-end capability creation and ownership of intellectual property (IP). Here, a mutually rewarding partnership with a willing ally could prove beneficial.

The United Kingdom is one such country that is ready to go one step further, enabling not only technology transfer but the co-creation of capabilities in-country. The UK industries, with the support of the UK government, have a proven history of partnerships with other nations that have resulted in successful programmes. These include the EJ200 (developed with Germany, Spain and Italy) and the ongoing next-generation Global Combat Air Programme (being developed in collaboration with Italy and Japan), wherein Rolls-Royce has played a critical role

in the success of the collaboration. With a proven legacy of technology development collaborations and demonstrated technical know-how, the UK can complement India's own technical and resource strengths and capabilities for joint development. As the two countries have pledged their commitment to greater cooperation in defence and security, it is an opportune time to build on the relationship.

Rolls-Royce is well-positioned to support such a collaboration with its ecosystem of strategic local partnerships, strong supply chain, rich talent pool, digital solutions and service delivery capabilities in India. We have been serving the Indian armed forces for nine decades and are committed to strengthening this relationship. Rolls-Royce's India presence is backed by over 100 years' experience in engine design, development and manufacturing, particularly in the complex, gas turbine-based aero-engine segment. All these factors make us a potentially game-changing partner for India's combat engine programme. We are offering a co-development model that leads to IP ownership in India, naturally followed by co-production and co-manufacturing opportunities. Such co-development will result in the creation of capability in-country to indigenise defence technologies.

India's defence industry is at a transformational tipping point. Aimed at rapid indigenisation, the government's efforts have been directed towards revamping the manufacturing ecosystem with a focus on technological innovation, enhancing capacity and building a robust supply chain to meet both domestic and international demand. At this point, a strategic collaboration that results in both technology and capability creation would accelerate India's goal of becoming a leading global defence hub.



Article by Alex Zino, Rolls-Royce



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GE Aerospace: India's Trusted Partner in Aerospace and Defence

GE Aerospace has been a steadfast supporter of India's efforts to achieve defence self-sufficiency for the past three decades. To assist India's development, GE has maintained a sustained presence in India by constructing world-class manufacturing and engineering facilities. We take great pride in having supplied the Tejas, an indigenous Light Combat Aircraft from India, with its engines. Along with providing the programme with engines, GE Aerospace partnered with Hindustan Aeronautics Limited (HAL) to assist Tejas development, enhancing India's capacity to create cutting-edge combat aircraft. Additionally, GE and the Indian Air Force are working together to construct Tejas programme engine repair facilities in India. GE and HAL operate together to assemble and deliver GE LM2500 gas turbines, which are used to power the frigates and indigenous aircraft carrier of the Indian Navy. Over 1000 engineers work in one of GE Aerospace's major engineering facilities in Bangalore, which is dedicated to the development of new technology for aero-engine design and lifecycle support. GE Aerospace has built in India all the ingredients required to grow a full scale aero-engine industry, from design through production to lifetime support.

GE Aerospace proactively pursues a comprehensive plan geared to expand our current operations in India into a full aero-engine industry and strongly supports India's Make in India initiative. This plan is created to assist the Indian armed forces throughout the lifecycle of an aero-engine. The engineering, manufacturing, aftermarket services, and advanced manufacturing technologies are some of the components of this sector. Over the next ten years, GE wants to be a dedicated partner in making Make in India a reality. With capabilities built upon a strong, truly sustainable commercial engine component manufacturing basis, GE's own manufacturing facilities in Pune and our expanding Indian supplier chain focused on Tata (Tata Advanced Systems) are well positioned to enter the military engine manufacturing market. This capability is now based in India and contributes millions of dollars' worth of aero-engine components annually to GE's global supply chain. Given the fact that only GE now possesses this competence in India, GE can expand there to achieve the government's Make in India ambitions.



GE's marine LM2500

GE Aerospace's comprehensive 'Make in India' strategy will help India achieve its aspirations for Aatmanirbar Bharat. GE's strategy is neither an idea nor a promise. It is a far more advanced reality that is happening today. GE turns 'Make in India' into 'Made in India'. Some key highlights of GE's commitment towards Aatmanirbar Bharat include GE's rapidly expanding supply chain in India. Our supply chain in India is based on a partnership with Tata

Advanced Systems Limited. Each year, Tata supplies millions of dollars' worth of innovative components for GE's industry-leading LEAP engines. Tata's capabilities and capabilities continue to expand as it has demonstrated a clear ability to compete and win in the global marketplace.

GE is developing a robust network of medium and small business suppliers (MSMEs) in India as well. This growing network provides a lengthening list of essential components and services to ensure a fully indigenous manufacturing infrastructure. HAL is licensed to assemble, inspect, test and depot overhaul GE LM2500 engines in India. HAL supplies LM2500 marine engines to shipyards and the Indian Navy. GE and HAL are partnering to produce forgings used as raw material for engine components, a first for India.

GE has also partnered with the Indian Air Force to establish Tejas engine maintenance capabilities in India including a depot within the Indian Air Force. GE offers best in class life cycle cost as similar engines power multiple platforms. At GE skill development is given vital importance, sponsoring advance training for manufacturing machinists and employing them in the GE Indian supplier network. GE partners with Indian Universities and Institutions in developing aero-engine related technologies such as our Indian Institute of Technology Madras partnership for combustion modelling and our Indian Institute of Technology Roorkee partnership for cold spray technology.



Article by Youngje Kim, Vice President – APAC Region, Military Systems Operation – GE Aerospace

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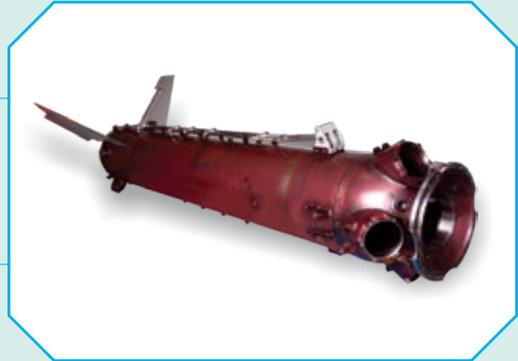
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