

SP's

SHOWNEWS



AN SP GUIDE PUBLICATION



सत्यमेव जयते

GOVERNMENT OF INDIA
MINISTRY OF DEFENCE



India : The Emerging Defence Manufacturing Hub

DEFEXPO 22
INDIA

18-22 OCTOBER, 2022 | GANDHINAGAR

Ministry of Defence

SEE US AT

HALL - 8
STALL NO. 8S.3

DAY
1

TUESDAY
OCTOBER 18, 2022



40 MM AUTOMATIC GRENADE LAUNCHER



MILKOR

AIR | LAND | SEA | CYBER



DefExpo 2022: India's 'Path to Pride'

The 12th edition of the exhibition is expected to be the biggest ever with 1,136 companies registered as of September for the hybrid show



(FILE PHOTOS) PRIME MINISTER NARENDRA MODI (LEFT) AND DEFENCE MINISTER RAJNATH SINGH (RIGHT) AT DEFEXPO 2020 HELD IN LUCKNOW.

AYUSHEE CHAUDHARY

After being postponed in March this year, amid the Ukraine-Russia war, India's biennial global exhibition is set to showcase the prowess of the Indian Defence manufacturing sector. DefExpo 2022 preparations have been in full swing to put together Asia's largest exhibition on land, naval, air and homeland security systems. Scheduled to be held from October 18, 2022 to October 22, 2022 in Gandhinagar, Gujarat, DefExpo 2022 promises to be the largest event since its inception in 1999.

The exhibition is expected to be the biggest ever as 1,136 companies have registered for the event as on September 27, 2022 when the Defence Minister reviewed the preparations. The final numbers are expected to be higher. The event has been organised over the largest ever total area of over one lakh sqm (previous edition being 76,000 sqm).

Live demonstrations, ship visits & a drone show will take place for the general public. For the first time, the event is being held in a four-venue format. The inaugural ceremony and seminars will be held at Mahatma Mandir Convention and Exhibition Centre; Exhibition at Helipad Exhibition Centre; Live Demonstrations at Sabarmati River Front and ship visits for the public by Indian Navy & Indian Coast Guard at Porbandar. The biggest-ever drone-show by IIT Delhi start-up Botlabs, which is an IDEX winner, has also been organised. The same start-up did the captivating drone show during the Beating the Retreat Ceremony after Republic Day and have been lighting up the sky across the country on various occasions ever since.

In the run-up to the event, a nation-wide outreach was undertaken inviting the States to set-up pavilions and thereby partake in nation building through enhancing indigenous defence manufacturing. Many States are participating with a State pavilion, the Ministry informed. The enhanced number of State Pavilions, which was eight as of August, would also provide the opportunity for Chief Ministers, Industries Ministers, Chief Secretaries etc to solicit investment and promote their respective States thus cultivating more centres for indigenous aerospace and defence manufacturing within the country. Also, to support and ensure a greater participation by start-ups and MSMEs, 50 per cent discount on space charges was offered.

ATMANIRBHAR BHARAT

The theme of Expo is 'Path to Pride', in line with Prime

Minister Narendra Modi's vision to transform India into a strong and self-reliant nation by supporting, showcasing and forging partnerships for the Indian Aerospace and Defence manufacturing sectors with Indian as well as global customers. To further boost 'Atmanirbharta', the DefExpo event will showcase the might of the domestic defence industry which is now powering 'Make in India, Make for the World' resolve of the Government and the nation at large. For the first time ever, the event will be exclusively for the Indian companies.

Indian companies, Indian subsidiaries of Foreign OEMs, Division of companies registered in India, Exhibitors having Joint Venture with an Indian company were considered as Indian participants. DefExpo 2022 will also mark the celebration of one year of the formation of the seven new defence companies, carved out of the erstwhile Ordnance Factory Board. All these companies will be participating for the first time at DefExpo.

The Expo will also feature an India Pavilion, "a marque pavilion of Department of Defence Production, Ministry of Defence" that will showcase the maturity of indigenous defence products, start-ups, latest technology, including Artificial Intelligence in defence, and will present India's vision for 2047. It has been named 'Path to Pride'. Over 50 start-ups will showcase their products at the pavilion. More than 300 partnerships in terms of MoUs, Transfer of Technology agreements and product launches are being finalised for signing and launch at the show.

In another first, Raksha Mantri Awards for Excellence in Defence Manufacturing will be presented during the DefExpo.

HYBRID HAVEN

Following the COVID-19 scenario, DefExpo 2022 is being organised in a hybrid manner to ensure greater engagement and outreach as exhibitors can cater to those who are not physically present. A mobile app has also been designed to streamline all information related to the exhibitors, venue maps, speakers, driving directions, notifications for visitors and exhibitors. Alongside that, various publications would also be available on this app. An added feature to share feedback, including delegate hospitality management and cleanliness issues has also been included.

The seminars during the event will be held at Mahatma Mandir Convention and Exhibition Centre, Gandhinagar in a hybrid format, enabling the speakers as well as the audience to participate virtually. These will be streamed worldwide. The seminars will be conducted by the leading Industry Associations,

PUBLISHER AND EDITOR-IN-CHIEF

Jayant Baranwal

SENIOR CONTRIBUTORS

Lt General (Retd) P.C. Katoch

PRINCIPAL CORRESPONDENT

Ayushee Chaudhary

CHAIRMAN & MANAGING DIRECTOR

Jayant Baranwal

PLANNING & BUSINESS DEVELOPMENT

Executive Vice President: Rohit Goel

SALES & MARKETING

Group Director: Neetu Dhulia

Deputy Director - Sales: Rajeev Chugh

LAYOUT DESIGNERS

Sr Designer: Vimlesh Kumar Yadav

Designer: Sonu S. Bisht

GROUP RESEARCH ASSOCIATE

Survi Massey

MANAGER - HR & ADMIN

Bharti Sharma

DEPUTY MANAGER - CIRCULATION

Rimpy Nischal

SP'S WEBSITES

Sr Web Developer: Shailendra Prakash Ashish

Web Developer: Ugrashen Vishwakarma

SP GUIDE PUBLICATIONS PVT LTD

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

Tel: +91 (11) 24644693, 24644763,
24658322

Fax: +91 (11) 24647093

E-mail: info@spguidepublications.com

Owned, published and printed by
Jayant Baranwal on behalf of
SP Guide Publications Pvt Ltd. All rights
reserved. No part of this publication
may be reproduced, stored in a retrieval
system, or transmitted in any form or
by any means, photocopying, recording,
electronic, or otherwise without prior
written permission of the Publishers.

Printed at Kala Jyothi Process Pvt Ltd,
Hyderabad

© SP Guide Publications, 2022

www.spguidepublications.com



For Advertisement / Editorial queries,
please contact us at **Hall-8, Stall- 8S.3**

PHOTOGRAPHS: SP Guide Publications
(Archive), PIB, respective OEMs and
miscellaneous

Astra Rafael Comsys – Carving a Niche for Itself

Astra Rafael Comsys (ARC) is leveraging technological ability and indigenous manufacturing capability to actively partner the Indian Armed Forces in a number of projects

Network modernisation that supports manoeuvre, secure communication with C2 and the ability to leverage advanced wireless technology are critical to ensure success in tactical missions across the spectrum of modern warfare while ensuring security of the soldier.

The BNET broadband IP Software Defined Radio (SDR), supports modern digital battlefield needs with high-speed, low-delay, reliable connectivity for broadband data, voice and video on the move. BNET enables land, sea and air radios to participate in a single, seamless and scalable MANET.

Astra Rafael Comsys Pvt. Ltd. is a JV company of Astra Microwave Products Ltd. (AMPL), India, and Rafael Advanced Defence Systems (Rafael), Israel. Setting high standards, this registered Start-up & AS 9100 D, ISO 14001 & EMS 27001 certified company is working towards carving a niche for itself in the Defence & Aerospace segment.

ARC's focus is on leveraging the technological ability and indigenous manufacturing capability of AMPL combined with the state-of-the-art technology expertise of Rafael to support the requirements of the Indian Armed Forces under the 'Make in India' program. ARC is manufacturing in India, BNET AR SDR at its Hyderabad plant for supply currently to the IAF & DRDO. Besides Tactical Communication Systems, ARC aims to be a dominant Indian player in the business areas of EW, SIGINT and high-end platform based EO Systems.



ARC, with assistance from Rafael has established a full-fledged eco system of selected and relevant Indian subcontractors seeking manufacturing competence in different technological areas for various sub-assemblies and components of the Software Defined Radio. Such efforts include transfer of knowledge of military grade manufacturing technology and integration for airborne radios in several technological disciplines. Best in class practices have been imparted to ARC's Indian partners, making them leaders in these critical technologies.

ARC is actively partnering the Indian Army in a number of projects focussed on realisation of net centricity at the forward edge

including platform integrated solutions for mechanised forces and infantry. ARC is participating in the Army's SDR Make II program for Manpack SDR viz. Design & Development of V/UHF Manpack SDR under Buy (Indian - IDDM) category.

Ahead of the DEFEXPO, CEO of ARC Nataraj Krishnappa said "Focused effort with our technology and JV partner at our NCW Application and Waveform Development Centre has manifested in the indigenously developed Manpack (MPS) SDR for the Indian Army's MAKE program. The SDR will be displayed in this DEFEXPO coupled with a live demo showcasing network capabilities of the BNET SDR" **ARC is exhibiting in Hall 7, Stall No 56 & 57.** ●



**VISION IS THE
ART OF SEEING
WHAT IS
INVISIBLE TO
OTHERS**

www.kasstechaerospace.in

SEE FURTHER, FASTER, CLEARER



Teledyne FLIR bring innovative sensing solutions into daily life through our thermal imaging, visible-light imaging, video analytics, measurement and diagnostic, and advanced threat detection systems. Teledyne FLIR strives to strengthen public safety and well-being, increase energy and time efficiency, and contribute to healthy and intelligent communities.

Kasstech Aerospace is the authorised distributor of Teledyne FLIR's thermal imaging cores in India. We bring a variety of cores to the market specifications and applications, some of them are Boson+, Vue proR, Tau2 and many more.

Industry leading in Size, Weight & Power

- Resolution - 640X512
- Pixel Size - 12microns
- Sensitivity - 20mK
- Weight - 7.5gms
- Power consumption - 900mW
- Operating temp range -40°C to 80°C
- Operating altitude upto 40,000 feet.



For more information on how Teledyne FLIR Thermal cores can be an integral part of your products such as weapon sights, thermal cameras for surveillance, vehicle based thermal solutions and airborne thermal sensor solutions, please contact us at flir@kasstechaerospace.in





(FILE PHOTOS) DEFEXPO IS FULLY SUPPORTED BY ARMED FORCES OF THE COUNTRY. SEEN HERE, AT DEFEXPO 2020, ARE THE THEN MILITARY LEADERS LIKE (CLOCKWISE FROM TOP LEFT) CDS GENERAL BIPIN RAWAT, COAS GENERAL M. M. NARAVANE, CNS ADMIRAL KARAMBIR SINGH AND CAS AIR CHIEF MARSHAL R.K.S. BHADURIA.

Think Tanks, Indian Defence Public Sector Entities, Service Headquarters (SHQs), Defence Research & Development Organisation (DRDO), Directorate General of Quality Assurance (DGQA), Ministry of Civil Aviation and State Government etc.

The theme of these seminars will broadly cover Exports, Financing and Investments in Defence Start-ups & MSMEs, Emerging role of MSME in Aerospace manufacturing & MRO, Atmanirbharta in Defence R&D, Futuristic Autonomous Technologies for Air Dominance etc. Leading international and national experts from the Defence and Aerospace sector are the speakers for various seminars. The details of the seminars are available on DefExpo 2022 website and mobile app.

INDIA-AFRICA & IOR CONCLAVES

The India-Africa Defence Ministers Conclave will be taking place this year too. The 2nd edition of the India-Africa Defence Dialogue, will have several Defence Ministers from the African countries. The first one was held in Lucknow during the 11th edition of DefExpo. The broad theme for this edition is 'India-Africa: Adopting Strategy for Synergising and Strengthening Defence and Security Cooperation.'

The conclave would hence focus on strengthening defence cooperation between India and the African continent as well as defence exports. Discussions on bilateral and multilateral levels to gauge the possibility of joint ventures, security solutions, spare parts, maintenance, and maritime security is also expected.

A separate Indian Ocean Region plus conclave has also been planned and would be another key discussion. There has been an increasing focus on enhancing the maritime security operations in the Indian Ocean Region and towards strengthening the Blue Economy. The Government has been taking steps towards this major defence area as India aims to meet the collective security needs of this region. The Prime Minister had also spoken about the changing geo-strategic situations and rising security concerns in the Indo-Pacific region as well as the Indian ocean.

START-UP STAGE

Innovations for Defence Excellence (iDEX), launched by Prime Minister Narendra Modi in 2018, essentially provides a unified platform for various stakeholders in the defence and aerospace sector. At the exhibition, the iDEX will showcase its startups and award its winner during its flagship event Manthan. This year iDEX is expected to sign the Memorandum of Understanding (MoUs) with three new partner incubators, who are leaders in venture development and science and technology. iDEX will also be launching a distinctive event, Invest4iDEX, inviting investors and venture capitalists, while providing the startups to pitch in front of the live audience and leverage the opportunity to generate investments and leads for future.

These are times for great opportunity in the defence sector with growing focus on indigenisation, as well as noticing the future demands call for more advancement, manufacturing and defence power in the volatile geopolitical scenarios that we are witnessing around the world. Organisation of DefExpo at a large scale during this time could prove to be crucial in the path ahead. ●



India - The Emerging Defence Manufacturing Hub



INDIA OPTEL LIMITED



75th Anniversary



Major Assembly of T-72 at IOP Dehradun

INDIA OPTEL LIMITED, DEHRADUN

- IOL - a leading Defence PSU in manufacturing of Opto - Electronics systems in India.
- Committed towards "Atmanirbhar Bharat" in Defence Production & Innovation.
- In-house up gradation & innovation in collaboration with govt. and private research entities leading to new products.
- State of the Art facilities under one roof for Optical, Electronics & Mechanical production capabilities.
- More than 75 years of experience in manufacturing of High-Precision Sighting Systems, Fire Control Systems and Specialised Cables.
- Dedicated and Skilled Workforce across all 03 units with substantial representation of female employees.



Enemy Can Neither Escape Nor Hide,
When IOL Products become "Soldier's Eye"

Raipur, Dehradun - 248008
Uttarakhand, India
CIN-U31909UR2021GO1012802

cmd@indiaoptel.in

https://www.indiaoptel.in

@iol_pro

91-0135-2780427



Astra Microwave Products Ltd.
On A Winning Wavelength



Radar Systems

Design | Development | Manufacturing | Integration | Testing & Evaluation

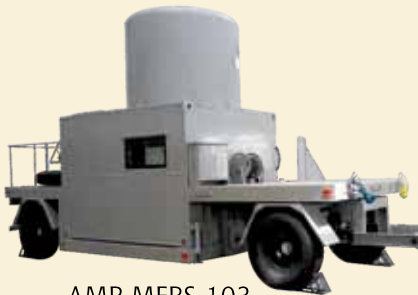
Multi-function Radar Systems



AMP-MFRS-101



AMP-MFRS-101



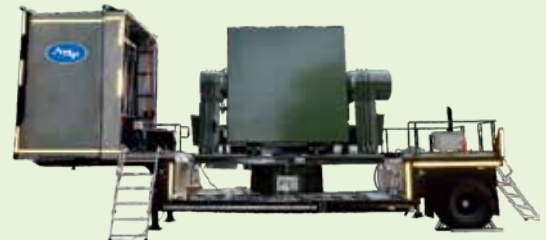
AMP-MFRS-103

Instrumentation Radar Systems

AMP-VADR-201 & 202



AMP-PMTR-204



AMP-PATTS-203

Perimeter Intrusion Detection Radar Systems



AMP-PIDR-301



AMP-PIDR-302

Meteorology Radar System



AMP-DWR-401



Multi Mission Meteorological Data Receiving & Processing System (MMDRPS)



AMP-WPR-402



AMP-WPR-403

Air Traffic Management Radar Systems



AMP-PPAR-501

Radiation Mode Test & Evaluation Facility for Radar EW systems



ASTRA Towers, Kondapur,
HITEC City, Hyderabad 500084

+91 40 46618000 | mktg@astramwp.com | www.astramwp.com
@astramwp | astra-microwave-products-limited





Showcasing
3D Ecosphere in India

DRDO participates in



India : The Emerging Defence Manufacturing Hub

DEFEXPO22
INDIA 18 - 22 OCTOBER, 2022 | GANDHINAGAR

Ministry of Defence

PATH TO PRIDE

Date:
18-22 Oct 2022

Visit us
at Hall-10



Defining India's Future in Advanced Defence Technologies



- Technology Focus
- Joint Venture and Collaboration Approach
- Local Production and Offsets
- Indigenous R&D and Co-development
- System Integration
- Technical / Warranty Support

Serving Indian Frontiers and beyond.....



— Visit us at —



India : The Emerging Defence Manufacturing Hub
DEFEXPO 2022
INDIA
18th-22nd OCTOBER, 2022 | GANDHINAGAR
Ministry of Defence

HALL | 09

STALL | 3, 4, 5, 10,
11, 12, 13, 20

18th-22nd October 2022
Gandhinagar, Gujarat, India



**Alpha Design
Technologies Pvt Ltd**

09, Service Road, HAL II Stage, Indiranagar, Bangalore - 560008
Tel: +91-80-4255 6909 Fax: +91-80-2521 6541
E mail: alphacorp@adtl.co.in Website: www.adtl.co.in



'Atmanirbharta' in Maritime Security

*Fully supporting self-reliance in defence manufacturing, Indian Navy continues to propel the domestic industry's growth, something that has far-reaching strategic consequences. In **Part 1** of an extensive interview with **Jayant Baranwal**, Editor-in-Chief, **SP's ShowNews**, **Vice Admiral S.N. Ghormade**, Vice Chief of Naval Staff, gave a comprehensive overview of the current and future plans of the Indian Navy.*

Jayant Baranwal (Baranwal): Aircraft Carrier

(a) Now that INS Vikrant is commissioned, where do you see the status of IAC-2?

Vice Admiral S.N. Ghormade (Ghormade): India's aspiration as a regional power to safeguard its interests and those of friendly countries, can be effected through a near continuous presence in the Indian Ocean Region (IOR). Indian Navy is seen as a force that provides regional stability and peace in the region. A three Carrier force would be essential to provide Sea Control in the vast Indian Ocean region. Needless to say, the flexibility, mobility, combat potential and resilience of an Aircraft Carrier are unmatched in conflict and has a deterrence effect during peace time. Further, the 24th report of the Standing Committee on Defence on Demand of Grants of the Ministry of Defence for the year 2021-22, has also brought out that Indian Navy (IN) requires a third Aircraft Carrier, so that at any given occasion, two aircraft carriers are operational in either seaboard for the Maritime Security of country. Indian Navy's necessity to acquire and operate a third aircraft carrier is well known and acknowledged at higher level.

(b) Particularly when such a project can help:

(i) Self-Reliance, strengthening & supporting Industrial ecosystem engaging SMEs, MSMEs

Ghormade: In charting a course into the future, visionary guidance has been enunciated by our National Leadership. The Nation has set itself a clear goal for India in 2047- that of being a developed nation.

Be it the Prime Minister's articulation of 'पॉच प्रण', or the single minded focus on Atmanirbhar Bharat, or transformational initiatives such as Digital India, Skill India, etc, - the aspirational national direction is absolutely clear. And therefore, the Navy in 2047 must be a fully 'Atmanirbhar' force that is 'combat-ready, credible, cohesive, and future-proof' in service of the Nation. Similarly, on July 18, 2022 during NIIO Seminar, Prime Minister has directed Navy to achieve unprecedented heights when India celebrates 100 years of its independence.

Self-reliance in defence manufacturing is one of the key thrust areas of Government of India (GoI). Commissioning of INS Vikrant was an outcome of years of hard work and perseverance by a team encompassing the Government, the Navy, Cochin Shipyard, the Indian Defence Industry, MSMEs, innovators and the workforce working together for a common purpose. Aptly showcasing that 'the whole is always greater than sum of its part'. Considerable expertise has been gained through design & construction of INS Vikrant, this needs consolidation & continuity which will enhance affordability of Aircraft Carriers. A substantial part of Naval budget is ploughed back into the Indian shipbuilding eco system, including a large number of MSMEs.

Naval shipbuilding offers immense opportunity for development of dual use technologies for both military and civilian agencies. A large number of military solutions can be adapted to commercial/civilian usage. Such dual use avenues include Hull equipment (Valves, Davits, Winches, Cranes), Air Conditioning, RO Plant, Refrigeration, Robotics, Unmanned Systems, Autonomous solutions, Composites, Communication and Networking, Sewage Treatment Plant, Garbage disposal, Cabling, Optical Fibre, Fire Fighting and Damage Control etc.

We aim to collectively produce these products that are Made in India - Made for India - and Make for the World - Something that has far-reaching strategic consequences.

Going ahead, the 43 out of 45 warships that are under construction in India, and existing 55 AoNs for ships and submarines that will be built in India, would continue to propel the domestic industry's growth.

(ii) Skill development & Employment generation

Ghormade: Construction of IAC-1 project at Cochin Shipyard (CSL) has immensely contributed towards considerable skill development in design, development of welder qualification and weld processes, integration of ship systems, etc. Towards augmenting the strength of personnel in shipbuilding industry, skill development of associated personnel is a given and such employable youth shall remain an asset to the country for the coming years. This would translate into availability of niche products for the Navy. The fact that a warship is like a township at sea which brings in technology that is required essentially in a smart city.

With Vikrant, 76 per cent was ploughed back into the Indian ship-building

ecosystem, encompassing 90 OEMs, over 100 MSMEs and 500 ancillaries, 2,000 direct and 13,000 indirect employment. In addition, items have been sourced from 18 States and Union Territories signifying the whole of nation effort.

I will reiterate here that the shipbuilding industry is manpower intensive and therefore, efforts of IN towards indigenous shipbuilding aid in generation of job opportunities and enable skilling of workforce. As per KPMG, the multiplier for employment in ancillary industry for ship building is 1:6.4. For example, the total shipyard manpower for Project 17A frigate is 4,000 personnel per annum. Thus, approximately 28,000 personnel are employed in ancillary industry for Project 17A frigate alone.

Indigenous construction of IAC-2 in an Indian Shipyard will provide impetus to the ongoing Atmanirbhar Bharat initiative of the Government, while also providing a huge employment opportunity to the Indian populace.

The number of captive personnel employed for the IAC-1 project on a continuous basis by CSL is 2000. Indigenous Aircraft Carrier programme provides a boost to employment generation not only in shipbuilding industry but also in ancillary industries wherein approx. 13,000 personnel have been employed.

More than 500 Indian firms are registered with CSL towards providing various services for construction of IAC-1. As per data provided by CSL, orders of almost ₹300 crore have been placed on MSMEs during the last

Continued on page 15...

Indian Navy's necessity to acquire and operate a third aircraft carrier is well known and acknowledged at higher level

TATRA PHOENIX

TATRA TAKES YOU FURTHER

Find more at **TATRATRUCKS.COM**

एरोस्पेस एवं रक्षा में उत्कृष्टता के साथ अग्रसर Driving Excellence in Aerospace and Defence



HAL's proven expertise, indigenous programs and thrust on excellence are redefining the Indian defence and aerospace industry. HAL is nurturing a competitive aerospace and defence ecosystem in India by partnering with private industries and MSMEs.



FOR INFO. SCAN
QR CODE

DRDO showcasing 430 strategic & tactical weapon systems, defence equipment & technologies

3D (DRDO, Designed and Developed) ecosphere is major theme

SP'S SPECIAL CORRESPONDENT

Defence Research and Development Organisation (DRDO) is displaying a wide range of 430 products encompassing the strategic and tactical weapon systems, defence equipment and technologies developed in DefExpo 2022. The major theme for this year's DRDO participation is based on 3D (DRDO, Designed and Developed) ecosphere which will highlight its strong linkages with both Industry as well as Academia.

Further, it is showcasing 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 indigeneness in advanced and futuristic defence products & technologies that contribute towards Atmanirbharta in Defence.

In addition, DRDO is displaying several initiatives to deepen its strategic partnerships with Industry, and Academia. These include initiatives such as Technology Development Fund, Dare to Dream, DIA- Centres of Excellence and other similar schemes to support academia, Start-ups, MSMEs and large industries to continuously upgrade technology readiness levels of present and futuristic technologies in the country. All these DRDO led initiatives have led to operational readiness of many Indian industries, especially in the areas of systems, radars, sonars, missiles, aircrafts, etc some of which are displayed at the DRDO Pavilion.

At DefExpo 2022, DRDO is providing numerous static displays, live demonstrations, seminars as well as immersive experience zones spread across three locations including the Mahatma Mandir Convention & Exhibition Centre, Helipad Exhibition Centre, and Sabarmati River Front.

The venue for DRDO Pavilion is Hall no. 10 of Helipad Exhibition Centre. It is segmented in 17 display zones of various classes including Immersive Zones and Experience Zones to showcase 376 products. These 17 zones are namely Engines & Propulsion, Aerospace & Aeronautics (UAVs, fighter aircrafts, 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.

Several technologies developed for land based, naval and air-based systems are showcased through experience zones – a closed room immersive cinematic experience. In a first, Advanced Combat Aircraft (AMCA) simulator will be made available to experience, among other augmented and virtual reality Naval, Land and Air product simulators. A holographic deck providing a 3D experience of over 30 defence products is present at the hall to gain insights into the intricacies of weapon designs.

Over a sprawling 1200 sq. mtr. outdoor display, 18 Outdoor static exhibits (actual products) are also put on display at the Helipad Exhibition Centre. These include 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), Unmanned Ground Mobile Platform (UGMP).

DRDO is presenting Live Demo as well as Static Display of equipment at the Sabarmati River Front. Five Live demo of DRDO equipment are being 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 six static displays of DRDO equipment presented are AIR Independent Propulsion System, Virtual Reality based counter measure deployment simulator, TAL Torpedo, Portable Diver Detection Sonar, Wet End Unit, Counter Drone System for IN – D4 Radar, Soft Kill System and Hard Kill System, and Passive IRSS Device.

At DefExpo 2022, DRDO is providing numerous static displays, live demonstrations, seminars as well as immersive experience zones spread across three locations

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

A seminar conducted by DRDO on the theme 'Atmanirbhar Bharat in Defence R&D: Synergistic Approach' will be held at the Mahatma Mandir Convention Centre in the forenoon session on October 20, 2022. This will be chaired by Defence Minister. Winners of Dare to Dream 3 will be awarded by Defence Minister. DRDO will exchange MOU with six IITs and Bharathiar University for establishing new DIA-CoEs in presence of Defence Minister. Dare to Dream 4 contest will also be declared open by Defence Minister. Minister of State for Defence will release a few monographs and policies.

Over the span of the exhibition, the participants and attendees will witness a string of major events, seminars, and discussions. Among these is one such event – Bandhan

–designed to handover licenses of DRDO developed technologies to the industries. DefExpo 2022 will see 15 LAToTs and 10 technologies to 12 industries in its Bandhan event. ●



PATH TO PRIDE



ATAGS

(Advanced Towed Artillery Gun System)

Setting 'Gold Standard' Globally for Towed Artillery Gun in the 155mm/52cal segment

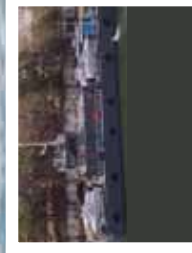
- Fired at 13,000+ feet height in Sikkim, creating new record which no other 155mm gun has reached and fired, thus proving endurance and reliability
- Successfully completed 500+ kms in treacherous high-altitude terrain up to 15,400 feet and proving ease of mobility
- World record with longest firing range of 48.074 km (HE-ERFB BB), thus proving range
- System has the phenomenal ability to fire in zone 7 charge (only gun in the segment with larger chamber volume), thus proving lethality
- Shortest Turning Circle Diameter for any towed gun of 155mm/ 52cal calibre with patented technology, thus proving innovation

 ARTILLERY
  PROTECTED VEHICLES
  AEROSPACE
  ARMOURD VEHICLES
  AIR DEFENCE SYSTEMS
  AMMUNITION
  DEFENCE ELECTRONICS
  SMALL ARMS
  NAVAL SYSTEMS

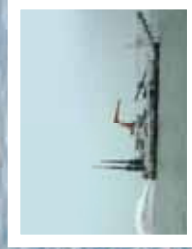
Mundhwa, Pune - 411 036. Tel: +91-20-6704 2777 / 2868 | contact.defence@bharatforge.com | www.bharatforge.com



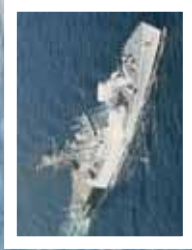
**MULTI-PURPOSE
SUPPORT VESSELS**



**FLOATING
BORDER OUTPOSTS**



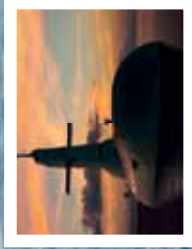
DREDGERS



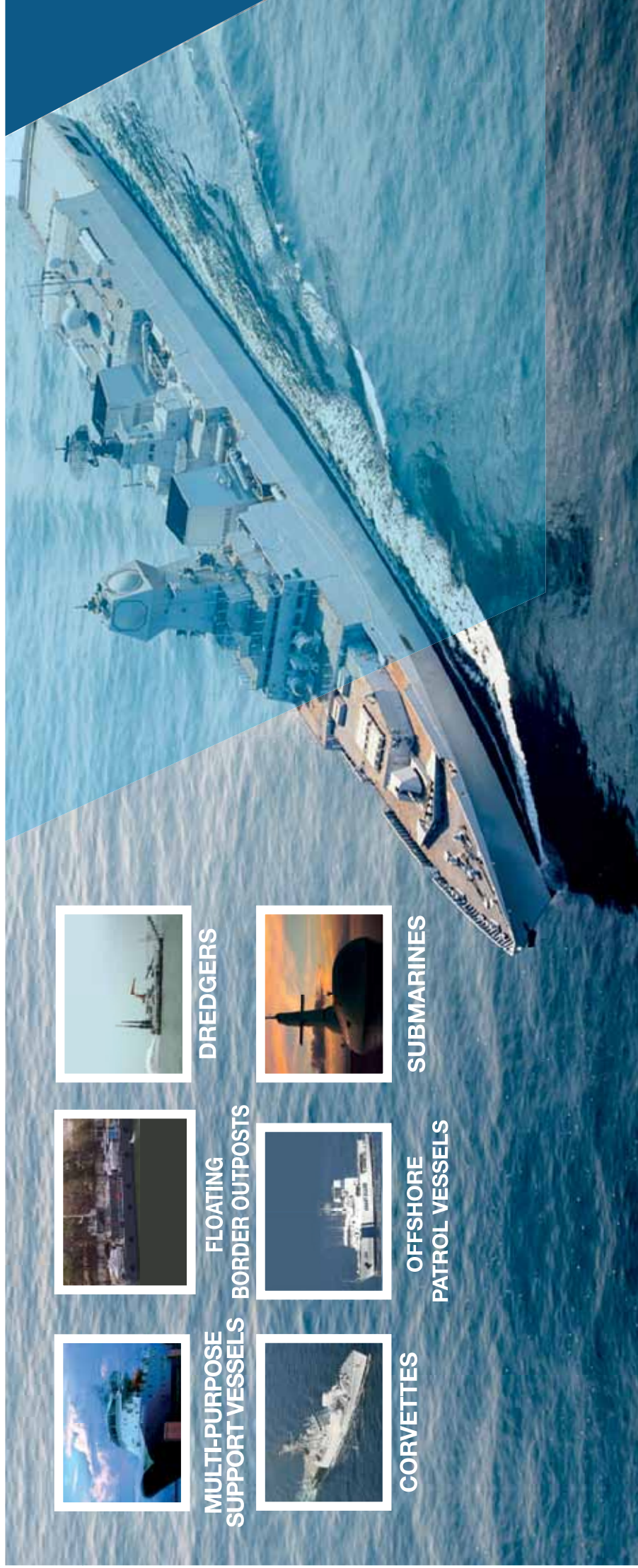
CORVETTES



**OFFSHORE
PATROL VESSELS**



SUBMARINES



NEW BUILDS

Vast experience in building Commercial ships for Domestic and International market

Past experience in constructing ships and Submarines

REPAIRS & REFITS

Undertakes repairs of various types of commercial ships and refits of warships and submarines

SERVICES

Transfer of Technology in design and construction of Warships

TRAININGS

Training of employees through exposure to development programmes both in house and external behavioural as well as technical training

India's only shipyard to have built Destroyers and Conventional Submarines for the Indian Navy. (Source: CRISIL Report)



MAZAGON DOCK SHIPBUILDERS LIMITED

(Formerly known as Mazagon Dock Limited)

A Govt of India Undertaking, Ministry of Defence

Dockyard Road, Mazagon, Mumbai-400010, India

Email : mdlmtg@mazdock.com | bgeorge@mazdock.com

Ph. : +91 22 23763300 | +91 22 23763069

Fax : +91 22 23738159 | **Website** : www.mazagondock.in



VTOL: Transforming Tactical UAS Operations

IAI's newly extended UAS family now offers vast and agile operational capabilities



(LEFT) WANDERB VTOL MINI UAV; (RIGHT) THUNDERB VTOL SMALL TACTICAL UAV

SP'S SPECIAL CORRESPONDENT

IAI's family of VTOL-UAS provide a new, middle tier between the Heron MALE and small, mini-tactical drones. Developed and produced by IAI's subsidiary BlueBird Aero Systems, the ThunderB and WanderB drones merge the capabilities of small tactical drone and multi-rotor drone, unbound to airfields or complex launch, retrieval and long turnaround cycles. They are optimised for simple use at the low echelon in all terrains, including maritime environment, and provide excellent intelligence products, delivering services that were previously rendered only by large platforms.

INTRODUCING THE VTOL FAMILY

The ThunderB-VTOL and WanderB-VTOL are both hybrid fixed-wing UAVs, offering high operational flexibility and combine the advantages of a fixed-wing UAV with the benefits of a multi-copter. As fixed-wing platforms, they offer Extended endurance, high-speed operation in harsh environments, large area coverage, silent operation, and ability to glide to safe landing. As multi-rotor platforms, they have the ability to take off and perform a soft and accurate landing in small and limited areas, such as on ships in mid-sea, small forest clearings or flat rooftops in urban areas. They can also hover over an area of interest when needed. This is done without the logistical footprint required to support the takeoff and landing of small tactical fixed-wing platforms.

These innovative and versatile systems are designed to conduct covert, real-time, "over-the-hill" or extended range operations, in day-and-night, collecting Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR), provide rapid tactical mapping on demand (TMOD), through GPS marked, High-Definition (HD) photogrammetric video processing.

VTOL-UAS ADVANTAGES

- **Operational Flexibility:** Operations in urban areas, forests and jungles and maritime environment often lack adequate areas for the launch and retrieval of drones. In these environments the VTOL-UAS transforms to a large multi-rotor drone that blends the vertical access and hovering capability with the speed, mission endurance and low signature typical of the fixed-wing, forward flight regime. Add these to low-cost benefits (no runway needed, less crew-members to operate, and less equipment) and you get a winning solution for tactical military/civil operations.
- **VTOL-UAS become very useful in operations from enclosed space,** such as the small decks onboard ships or offshore platforms. Since their flight is more efficient, VTOL-UAS can carry heavier payloads, compared to multi-rotor drones. Such payloads can include small radars, multiple EO/IR gimbaled payloads and SIGINT. Performing missions with long-endurance, VTOL-UAS launched and operated from ships at sea can cover wide areas, deep at sea and far from land.
- **Mission Economy:** Since each of the flight phases uses a propulsion system optimized for it, the combined propulsion system is energy efficient. The four rotors providing the lift for vertical flight and hover can operate with rotors and RPM optimized for lift, while the forward flight is supported by low-drag and low RPM propellers and motors for higher speed and longer endurance. Designers can choose between electric, hybrid-electric or piston engine motors, to meet the mission requirements with best performance.
- **Signature Reduction:** Using electrical propulsion, propellers and rotors optimized to perform effectively, reduces the acoustic signature, in addition, comparing to "standard" multicopter, by operating a fixed-wing platform that just vertically takeoff and land, provides an important tactical advantage when

BLUEBIRD COMPLETES DELIVERY OF 100 VTOL UAVS

BlueBird Aero Systems, partially owned by Israel Aerospace Industries (IAI), completed the delivery of 100 WanderB-VTOL UAVs to a European customer. The Vertical Takeoff and Landing (VTOL) UAVs are part of a transaction involving over 150 WanderB-VTOL and ThunderB-VTOL UAVs worth tens of millions of dollars. This is the world's largest number of VTOL UAVs delivered to any customer at one time, and was completed within the agreed timetable despite COVID-19 conditions.

The transaction reflects a glob-

ally emerging trend of VTOL UAVs, which provide important benefits for land and maritime applications as they combine the advantages of a fixed-wing UAV (long-range, long-endurance, high speed, wind independency, large area coverage, etc) with the advantages of a multi-copter (ability to take off and land in confined areas, accurate, safe and damage-free landing, etc). The asset and capability combination of IAI and BlueBird is expected to yield additional breakthrough operational solutions on the market. ●

operating at low altitude, deep in hostile territory. Reduction of size, compared to large platform, further reduces the platform's visible and radar signature.

- **Speed:** Platforms relying on fixed-wing designs can achieve higher cruise and dash speed, gaining transit and cruising speeds dozens of knots faster than multirotor drones designed for equivalent weight and size specifications.
- **Payloads:** Designed to operate on long missions with large payloads, VTOL-UAS are designed around the payload to meet mission requirement with an optimal platform weight and size. With three payload attachment points they can operate a compact radar, EO/IR and SIGINT/COMINT. The payload bays and attachments are designed to open standards, enabling users to add mission payloads from other OEMs, what makes the platform and entire solution as competitive and affordable as possible.
- **Redundancy:** Multi-rotor drones have little redundancy as they need all rotors to generate lift, thus, any failure of a rotor, motor or flight system leads to mission abort, immediate descent and emergency landing or crash. The VTOL-UAS has two lift systems that provide redundancy for the critical landing phase. The electric quadrotor generates the lift for the vertical landing, but the drone can also perform landing using parachute, airbag or skid on a flat surface in case of emergency, in case of partial or complete rotor system failure due to mechanical or combat damage.

LEADING THE VTOL GENERATION

With clear and proven benefits to the user, VTOL-UAS have the potential to transform tactical drone operations. The market is converting to the new technology that offers many benefits to the users, as they realised the performance and logistic advantages of this new capability. All branches of the US military are already moving in this direction, as other military forces and commercial users worldwide. BlueBird Aero Systems and IAI are among the few pioneers in this field, who have delivered and fielded systems on a large scale to a number of users. Unlike other manufacturers that rely on third-party systems quadrotor system, the IAI-BlueBird Aero Systems drones use ISTAR-free, bespoke VTOL system developed in-house that is optimised for each platform. This new capability offers significant advantage to the user, by reducing the logistic footprint required for operational deployment with tactical forces. ●

Thank you, Stakeholders. We owe it to you.



BEL is ET 'Iconic Brand of the Year'

Bharat Electronics Limited (BEL), a Navratna Defence PSU which shaped the growth of Defence electronics in India, is once again in the limelight for its iconic brand value, as **"The Economic Times - Iconic Brand of India - 2022"**. This is a testimony to the unwavering trust that customers and other stakeholders have reposed in BEL.

**Choice of Customers,
Committed & Competitive**



BHARAT ELECTRONICS LIMITED
Registered & Corporate Office, Outer Ring Road,
Nagavara, Bengaluru - 560 045. Tel: +91 80 25039300.
Fax: +91 80 25039291. Toll free: 1800 425 0433.
CIN: L32309KA1954GOI000787 www.bel-india.in

Visit us at:
Hall 2, DEFEXPO 2022
Oct 18-22, 2022
Gandhinagar, Gujarat

Empowering the Nation's Defence Forces



Building Indigenous Capabilities for Atmanibharta in Indian Aerospace and Defence

Boeing has deepened its engagement with current and potential suppliers to enhance their capabilities and deliver high quality products

SALIL GUPTÉ,
PRESIDENT, BOEING INDIA

India is one of the fastest growing economies in the world and offers enormous growth opportunities. At Boeing, as we reflect on our own journey in the country over the last 75 plus years, we feel privileged and proud to have been part of the development of the indigenous aerospace and defence capabilities in India. Aerospace and defence aficionados know that Boeing's relationship with India goes back to the 1940s when the Indian Air Force enlisted two Boeing aircraft: The T-6 Texan, and the C-47 Skytrain military transport. From then on through the years, Boeing has continuously invested in local capacity building and has collaborated with Indian organisations across manufacturing, infrastructure, engineering services, research and technology, training and skills development. Our contribution to the nation is not limited only to our products and services, it goes beyond to build capability and capacity for indigenous players to become an integral part of the global defence and aerospace industry.

Boeing's sourcing from India stands at \$1 billion annually through its large and growing network of 300+ supplier partners that are an integral part of our global supply base. These Indian companies are manufacturing and exporting systems and components for some of Boeing's most advanced products from

been delivered by TBAL for Boeing customers around the globe, including in India. A true example that supports the Prime Minister's call for "Make in India, for the World".

Boeing believes that the maturation and development of India's local MRO ecosystem is an imperative for success in the Indian market, and to enable faster turnaround times, and higher operability and mission-readiness critical for its Indian customers. The efforts and initiatives being undertaken by Boeing in India are aimed at building capability and capacity of indigenous organisations to gain prominence on a global scale.

In 2021, Boeing launched the Boeing India Repair Development and Sustainment (BIRDS) program in its effort to help develop India into a regional MRO hub, enabling engineering, maintenance, skilling, repair and sustainment services of defence and commercial aircraft right here in India, for India. Under this program, we signed strategic partnerships with leading indigenous players like Horizon Aerospace, Air Works, and AI Engineering Services Limited (AIESL). An important aspect of the hub is training programs to increase skilled manpower by developing sub-tier suppliers and medium, small and micro enterprises (MSMEs) to build high quality MRO capabilities in India. Our programs have skilled more than 3,700 frontline aerospace manufacturing workers and aircraft maintenance engineers.



(LEFT) TATA BOEING AEROSPACE LIMITED FACILITY IN HYDERABAD;
(RIGHT) ELEVATION OF THE UPCOMING BOEING ENGINEERING AND TECHNOLOGY CAMPUS IN BENGALURU, KARNATAKA.

India to the world. We are proud to be working with indigenous manufactures such as Dynamatic Technologies, Rossell Techsys, SASMOS HET Technologies, Hindustan Aeronautics Ltd. (HAL), and Jaivel Aerospace, among many more who are building critical components for some of our global platforms such as the F-15EX Eagle II, V-22 Osprey, CH-47 Chinook, F/A-18 Super Hornet, P-8 and the T-7A Red Hawk. Our commitment to build supplier relationships and foster an environment of transparency and collaboration at each step, has helped in accelerating productivity improvements and operational efficiencies year after year. These relationships have grown to the extent that today the focus has moved from "supplier management" to "supply chain management". A testimony of our commitment is reflected in the recent "Supplier of the year" award for 2022, which was won by Tata Advanced Systems Limited (TASL), among more than 11,000 suppliers worldwide. We are proud that today, as we have deepened our engagement with current and potential suppliers to enhance their capabilities and deliver high quality products, we have also helped in creating jobs and bolstering India's manufacturing sector.

Our joint venture with Tata, Tata Boeing Aerospace Limited (TBAL), in Hyderabad, in its sixth year of operation, the 14,000 sq. ft., state-of-the-art facility employs over 500 engineers and technicians, and demonstrates co-development of integrated systems in aerospace and defence in India. The TBAL facility in Hyderabad manufactures hundreds of Apache fuselages for customers around the world, including for the US Army. As of September 2022, 170+ fuselages have

The Boeing India Engineering & Technology Center (BIETC) in India is leveraging a talented pool of 3,000+ engineers and innovators across Bengaluru and Chennai to drive growth and innovation in aerospace. The center currently houses Boeing's Engineering, Test, Research and Technology, Information Technology and Digital Analytics teams. These technologists undertake high-quality, advanced aerospace work and offer engineering expertise to Boeing's defence, space, and commercial businesses, spanning engineering design of structures and systems, manufacturing support, developing systems to test our aircraft, and providing digital solutions to our airline customers. Cutting-edge R&D in traditional and emerging areas is performed at the center, including next-generation airplane health management, environment-friendly coatings, advanced networks and secure-communications where teams leverage new-age technologies such as Artificial Intelligence, Machine Learning, Internet-of-Things, Cloud, Model-Based Engineering, and Additive Manufacturing to enhance quality, safety, and productivity. We are investing \$200M in a new 43-acre state-of-the-art wholly-owned engineering and technology campus in Bengaluru. This will be Boeing's largest facility of its kind outside the US.

India's defence sector is poised for growth, and Boeing is committed to supporting and enabling this progress. We believe that building capabilities indigenously will drive innovation and contribute to the growth of the Indian aerospace and defence industry. The future looks promising and Boeing's vision for India continues to be to bring the best of Boeing to India and take the best of India to the world. ●

Modern and Quality Ammunition for the Battlefield

Munitions India Limited (MIL) is a Defence Public Sector Enterprise (CPSE) under the Ministry of Defence, Government of India.

MIL, the India's biggest manufacturer and market leader is engaged in Production, Testing Research & Development and Marketing of comprehensive range of ammunition & explosives for Army, Navy, Air force & Para-Military Forces.

With Corporate Office at Pune (India), MIL in its 12 state-of-the-art manufacturing units located across the country employs skilled workforce of around 25,000. These factories have proven integrated base for production of Small, Medium & High calibre ammunition, Mortars, Rockets, Hand Grenades etc. with in-house manufacturing of Initiatory Compositions, Propellants and High Explosives for over 150 years. Our primary objective is to provide competitive edge to the Armed Forces by equipping them with modern and quality battlefield ammunition.



(FROM LEFT) 762 X 51 NATO TRACER; 125 MM SCCC; 125 MM FSAPDS; 84 MM HEAT 751; PINAKA ROCKET.

Our foreign customers include countries located in North America, South America, Europe, Africa and Asia. The patronage we receive from our customers both in India and abroad reflects their faith in quality of our products and services. We are the force behind the Armed Forces.

MIL with its 12 manufacturing units provide:

- A broad and versatile production base with multi-technology capabilities
- State-of-the-art manufacturing facilities
- Large pool of skilled and professionally qualified manpower and managerial personnel
- Strict adherence to quality standards (all units are ISO-9000 certified)

- Original as well as adaptive Research & Development to make need-base refinement and modifications
- A strong base for industrial training & testing

'Atmanirbharta'...Continued from page 8

ten years. Therefore, the shipyard has generated significant business opportunities for SMEs/MSMEs.

(c) Chinese Fujian - 3rd Aircraft Carrier

The programme has been reported as a 'message to its rivals'. How do you perceive this programme of China - an unpredictable neighbourhood?

Ghormade: The Chinese Aircraft Carrier programme is an extension of the Chinese Maritime Capability expansion and it is part of a natural progression. The Indian Navy has already put in place a force accretion programme to meet our maritime security needs and maintain its primacy in the Indian Ocean Region.

Jayant Baranwal: Carrier borne Fighter

(a) When can we get to see the finalisation of this requirement?

Ghormade: In order to meet the Indian Navy's long term requirement of a next generation deck based fighter, Navy is pursuing the Twin Engine Deck Based Fighter (TEDBF) programme with DRDO. The TEDBF is an indigenous effort to meet future requirements and envisaged as a replacement of the MiG-29K/KuB which will strengthen our resolve for 'Atmanirbhar Bharat'. The existing inventory of MIG-29K aircraft are inadequate to meet the total number of fighters required to operate from both the aircraft carriers. Thus, it is extremely important for the Navy to procure additional multirole carrier borne fighters as an interim augmentation of fighter aircraft till fructification of TEDBF Project.

(b) Can you remind us as to what are the key features/key expectations out of this particular requirement?

Ghormade: TEDBF would be a Twin Engine Deck Based Fighter which would operate from IN Aircraft Carriers. TEDBF would be developed by ADA, a DRDO agency, and is intended to perform multitude of mission with indigenous Weapons, Avionics and Sensors.

(c) Any plan for 5th Generation Fighter programme?

Ghormade: TEDBF is designed to meet the requirement of 5th Generation fighter specific to IN operations. ●

For full interview,
please refer to SP's Naval Forces Issue 5/2022;
www.spsnavalforces.com



गोवा शिपयार्ड लिमिटेड
Goa Shipyard Ltd



MAKING IN INDIA FOR THE WORLD



India : The Emerging Defence Manufacturing Hub
DEFEXPO 22
INDIA
18 - 22 OCTOBER, 2022 | GANDHINAGAR
Ministry of Defence

BUILDING FUTURISTIC & POTENT PLATFORMS

18-22
OCT
2022
10 am onwards

GSL STAND 2R.19,
HALL No. 2 &
STATIC DISPLAY
AREA OD.12

SWARNIM PARK
HELIPAD EXHIBITION
CENTRE, SECTOR 17
GANDHINAGAR,
GUJARAT







- goashipyarldtd

Lockheed Martin Showcases Commitment to a Self-Reliant India

The company will showcase an expansive portfolio from its Aeronautics, Rotary & Mission Systems, and Missiles and Fire Control business areas



(LEFT) F-21 FIGHTER ; (RIGHT) MH-60R SEAHAWK

SP'S SPECIAL CORRESPONDENT

Lockheed Martin will showcase its diverse portfolio of defence capabilities and solutions at DefExpo India 2022. The company's exhibit this year includes a broad span of advanced technologies from the Aeronautics, Rotary and Mission Systems, and Missiles and Fire Control business areas.



WILLIAM L. BLAIR

"Lockheed Martin is committed to assisting in the growth of India's strategic security capabilities and the advancement of its defence manufacturing ecosystem. Our joint ventures with Tata and industrial relationships with many Indian companies—such as Ashok Leyland, Lakshmi Machine Works, Midhani, Rossell Techsys, and SASMOS among others are a testament to the success of the government of India's mission to create 'Atmanirbhar Bharat' in the defence sector," said William L. Blair, Chief Executive, Lockheed Martin India Pvt. Ltd.

"Participating at DefExpo 2022 gives us the opportunity to showcase our advanced technologies and innovative capabilities directly to the largest gathering of defence and aerospace partners and our customers in India," Blair said. "We look forward to engaging with our customers and industry partners to discuss their key priorities for advancement of India's national security, indigenous production and human capital development agendas."

The prime attraction at Lockheed Martin's booth this year will be one of the most technologically advanced complex aerostructures—a "Made in India" fuel-carrying, 9G, 12,000 hour, interchangeable/replaceable fighter wing. This wing was manufactured at the Tata Lockheed Martin Aerostructures Limited (TLMAL) facility in Hyderabad. The TLMAL joint venture exemplifies the government of India's "Make in India" goals and also serves as the single global source of C-130J empennage assemblies installed on all new Super Hercules aircraft. To date, TLMAL has manufactured and exported more than 180 C-130J empennages.

The F-21 fighter aircraft, which is on offer to the Indian Air Force (IAF) will also occupy a prominent place at Lockheed Martin's booth. The company is leveraging both 4th and 5th generation technologies to offer the best solution to meet or exceed the IAF's capability needs, provide Make in India industrial opportunities, and accelerate India-United States cooperation on advanced technologies, including but not limited to fighter aircraft. The F-21 demonstrates Lockheed Martin's commitment to delivering a technologically advanced, single-engine fighter to the IAF — For India, From India.

The Indian Navy's acquisition of MH-60R "Romeo" multi-mission helicopter is another highlight for Lockheed Martin at the show. The MH-60R is the world's most advanced maritime helicopter and brings vital anti-submarine and anti-surface warfare capabilities to the Indo-Pacific region. The US Navy has already delivered the first three aircraft to the Indian Navy in 2021 and these aircraft are being utilised to train Indian pilots and crew members in California. In July-August 2022, the US Navy transported to India another three helicopters, which 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.



C-130J

India's workhorse, C-130J Super Hercules airlifter, which represents a strong legacy of partnership between India and the US, also will be on display at the Lockheed Martin booth. The IAF uses its fleet to support a variety of missions, from cargo delivery to providing vital humanitarian aid including in the wake of the COVID-19 pandemic as well as for transportation of relief materials, equipment and personnel in the areas affected by cyclones Yaas and Tauktae.

The S-92 helicopter, best in class for safety and reliability, will also boost Lockheed Martin's presence at the show. The S-92 helicopter recently surpassed 2 million fleet flight hours which is a testament to the reliability of the multi-mission aircraft.

As part of the Javelin Joint Venture, Lockheed Martin also produces the Javelin anti-tank guided missile system. This versatile and effective one-man-portable and platform-employed multi-target precision weapon system provides capability to defeat a broad spectrum of close combat threats on the modern battlefield. Using fire-and-forget technology, the weapon guides itself to the target without external commands, allowing soldiers to take cover or reposition. With a range of 65 meters to 4 kilometers in most operational conditions, as well as the ability to operate through adverse weather and battlefield obscurants, Javelin can be deployed in a variety of environments and conditions.

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 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.

Lockheed Martin's presence at the show will be in strict accordance with COVID-19 protocols laid down by the Ministry of Defence and state government to ensure the safety of employees and visitors. ●

INS Arihant Carries out Successful Launch of Submarine Launched Ballistic Missile



INS ARIHANT

INS Arihant carried out a successful launch of a Submarine Launched Ballistic Missile (SLBM) on October 14, 2022. The missile was tested to a pre-determined range and impacted the target area in the Bay of Bengal with very high accuracy. All operational and technological parameters of the weapon system have been validated.

The successful user training launch of the SLBM by INS Arihant is significant to prove crew competency and validate the SSBN programme, a key element of India's nuclear deterrence capability. A robust, survivable and assured retaliatory capability is in keeping with India's policy to have 'Credible Minimum Deterrence' that underpins its 'No First Use' commitment. ●

DRDO & Indian Army Conduct Flight-tests of Quick Reaction Surface to Air Missile System

Defence Research and Development Organisation (DRDO) and Indian Army have successfully completed six flight-tests of Quick Reaction Surface to Air Missile (QRSAM) system from Integrated Test Range (ITR) Chandipur off the Odisha coast. The flight tests were conducted as part of evaluation trials by the Indian Army.

The flight-tests were carried out against high-speed aerial targets mimicking various types of threats to evaluate the capability of the weapon systems under different scenarios, including long range medium altitude, short range, high altitude manoeuvring target, low radar signature with receding & crossing target and salvo launch with two missiles fired in quick succession. The system performance was also evaluated under day and night operation scenarios.

During these tests, all the mission objectives were met establishing pin-point accuracy of the weapon system with state-of-the-art guidance and control algorithms including warhead chain. The performance of the system has been confirmed from the data captured by a number of Range instruments like Telemetry, Radar and Electro Optical Tracking Systems (EOTS) deployed by ITR. Senior officials from DRDO and the Indian Army participated in the launches.

These tests were conducted in the final deployment configuration consisting of all indigenously-developed sub-systems, including the missile with indigenous Radio Frequency (RF) seeker, mobile launcher, fully automated command and control system, surveillance and multi-function Radars. The uniqueness of the QRSAM weapon system is that it can operate on the move with search and track capability & fire on short halt. This has been proven during the mobility trials conducted earlier. ●



गार्डन रीच शिपबिल्डर्स एण्ड इंजीनियर्स लिमिटेड Garden Reach Shipbuilders & Engineers Ltd.

(A Govt. of India Undertaking)

61, Garden Reach Road, Kolkata-700 024

Tel: +91-33-2469 8100 to 8113, Fax: +91-33-2469 8150

Builders of 100 Warships



India : The Emerging Defence Manufacturing Hub
DEFEXPO 2022
18 - 22 OCTOBER, 2022 | GANDHINAGAR
Ministry of Defence

VISIT GRSE STALL**2R-27, HALL NO. 2****HELIPAD EXHIBITION CENTER****Delivered 107 Warships to Armed Forces of India & Friendly Foreign Countries****WARSHIPS**

I Frigates I ASW Corvettes I Missile Corvettes I FAC I
I Landing Ship Tanks (Large) I Survey Vessels I ASWSWCs I
I Landing Craft Utility Ships I Offshore Patrol Vessels I

ENGINEERING PRODUCTS

I Pre-Fabricated Steel Bridges I Railless Heli Traversing System
I Deck Machinery Items I
I Assembly/Testing/Overhauling of Diesel Engine I

Supplied Over 5500 Portable Steel Bridges to Indian
Army, Border Road Organisation, State PWDs, Central
Government & Friendly Foreign Countries

Scan the QR Code
for Corporate Video

For any query please contact:

✉ marketing@grse.co.in

Follow us :



grsekolkata



officialgrse



OfficialGRSE



garden-reach-shipbuilders-&-engineers



www.grse.in

In Pursuit of Excellence & Quality in Shipbuilding





GRSE: Strengthening Indian Armada Through Indigenisation

GRSE is at the cusp of a major transformation facilitated by its knowledge, skill levels and operational capabilities gained over the years

CMDE P.R. HARI (RETD),
CHAIRMAN & MANAGING DIRECTOR, GRSE LTD.

Set up in 1884 to repair vessels of River Steam Navigation Company, GRSE has several achievements to its credit in its long journey. After its acquisition by Government in India in 1960, GRSE has built 788 platforms including warships for Indian Navy, Indian Coast Guard, and Government of Mauritius & Seychelles Coast Guard. From Frigates, Corvettes, Fleet Tankers, Landing Ship Tank, Landing Craft Utility to Survey Vessels, Offshore Patrol Vessels and Fast Attack Craft - the repertoire is rich and varied. Making 107 warships for the Indian & foreign maritime forces, GRSE has record of building and delivering the highest number of warships by any Indian shipyard till date. With proven credentials, the shipyard is on a growth path, reaffirming its motto "In Pursuit of Excellence and Quality in Shipbuilding".

Rooted in the nation's vision of attaining Atmanirbharata in defence, Garden Reach Shipbuilders & Engineers Ltd (GRSE), a premier warship-building company in India, is at the cusp of a major transformation facilitated by its knowledge, skill levels and operational capabilities gained over the years. With brand equity, a healthy balance sheet and a dedicated team at the helm, the Mini Ratna Category 1 Public Sector Company, GRSE is playing a key role in defence preparedness of India by producing the most modern warships through indigenisation and strengthening the Indian armada. The company's order book stands at ₹24,100 crore as on March 31, 2022. GRSE's vision is to be globally recognised as the best Indian Shipyard and also become a Navratna Company by 2030.

ONGOING PROJECTS

The ongoing projects include construction of 24 ships & vessels under seven prestigious projects - Frigates (P17A), Survey Vessels (Large), ASW Shallow Water Crafts (ASW-SWC) for Indian Navy, Fast Patrol Vessel (FPV) for Indian Coast Guard, Next Generation Electric Ferry for Government of West Bengal, Ocean Going Passenger cum Cargo Ferry Vessel for Republic of Guyana and Patrol Boats for a government agency of Bangladesh. Concurrently, the shipyard is undertaking measures to strengthen internal processes, systems, and infrastructure and cost effectiveness. Several new initiatives have also been launched under the 'Ease of Doing Business' drive.

INDIGENISING WARSHIP BUILDING

As part of Make in India initiatives of Ministry of Defence, GRSE has made commendable progress by successfully incorporating a high percentage of indigenous equipment fit into the ships being built for the Indian Navy and Indian Coast Guard. This is evident on-board Kamorta class ASW Corvettes, the first warship built in the country with indigenous DMR steel and overall 90 per cent indigenous content with a unique feature of superstructure made of carbon fibre composite material. The Landing Craft Utility (LCU) ships, designed in-house by GRSE also achieved similar distinction. The company so far has delivered eight such LCU Mk IV ships to the Indian Navy.

The delivery of Fast Patrol Vessel - 'SCG PS Zoroaster' to the Seychelles Coast Guard in February 2021 and orders for supply of "Ocean Going Passenger cum Cargo Ferry Vessel" from Government of Guyana and Patrol boats for Fisheries Department of Bangladesh, to support the vision of 'SAGAR', bear testimony to GRSE's thrust for exports and realigning marketing strategies to match with the dynamic global environment. These orders were bagged through competitive bidding with international players in the fray.

GRSE & Syama Prasad Mookerjee Port Kolkata jointly inaugurated the GRSE-KPDD Khidderpore Dry Dock Unit in Kolkata for the development & utilisation of three existing dry docks. The project aims to explore new business opportunities in ship repair & refit of defence & commercial segments leading to revenue gener-

ation and contributing to skill development, infrastructure upgrade and employment generation in West Bengal.

THE ART OF WARSHIP DESIGN

GRSE's in-house design capability remains its major area of strength with the multi-disciplinary 100-plus design team working towards developing various concept designs for current and future warship projects aided by state-of-the-art Virtual Reality Lab. Offshore Patrol Vessel, Landing Craft Utilities, Survey Vessels (Large) and ASW Shallow Water Crafts have been designed in-house by GRSE. VR Lab resolves design issues in a very short time with reliability and accuracy. The lab also shows 3D models in virtual environment to assist the production and customers to get faster approval of the ship system. The company's Design and R&D Department has received recognition from the Department of Scientific and Industrial Research (DSIR), Ministry of Science & Technology, for its performance.

GRSE has its competitive edge as the shipyard has modernised infrastructures to undertake integrated shipbuilding using advanced modular construction technology to facilitate construction of larger ships in reduced timeframe. With modernised infrastructure facilities across three production locations, GRSE is today in a position to construct 20 Warships concurrently using Advanced Modular Integrated Shipbuilding Technology in line with the best in the world.

ENGINEERING

The Bailey Bridge division of the company has been keeping pace with the ship division in its R&D efforts in designing and developing new products. The division has developed and successfully carried out trials of new products including first-of-its-kind Man Portable Pedestrian Assault Bridge, which is made of light weight carbon fibre reinforced composite material for the Indian Army, 140 feet Double Lane (7.50 m wide) and 190 feet Single Lane modular bridge, both being 70R class load capacity and made of 7 feet panels.

GRSE is the only organisation in India qualified by DGQA, for the prestigious Green Channel Certification for the Bailey Type Portable Steel Bridges. So far, GRSE has supplied more than 5,500 portable steel bridges to Indian Army, Border Road Organisation, State PWDs, Central Government and friendly neighbourhood countries.

DIGITAL INDIA INITIATIVES

To maintain its competitive edge, the company is shifting to smart manufacturing (Industry 4.0), through thrust on innovations in automation, robotics and the industrial internet of things. It is also introducing Artificial Intelligence, Machine Learning, Interoperability and secured connectivity enabling real time monitoring. This control and optimization of processes, resources and systems is expected to help in workload consolidation across design, production & supply chain management, significantly in the future.

In its journey towards digitisation in strengthening the operation and shipbuilding efficiency, GRSE in collaboration with IIT Kharagpur has developed an AI Enabled Non-Destructive Testing (NDT) mechanism which aims to replace manual inspection with automated inspection by using Industry 4.0 techniques such as Artificial Intelligence, Machine Learning & Deep Learning. A first of its kind AI based HR Chatbot 'Ask ANVESHA' by GRSE was launched to provide employees digital access to their personal documents. The cloud-based Chatbot enables employees to access individual data like Payslip, PF statement, Form-16 etc.

Adopting the latest technology with respect to security of infrastructure and other assets, GRSE has established an Artificial Intelligence (AI) enabled high end CCTV network across its five units in Kolkata apart from other initiatives such as Face Recognition System, Document Management System (DMS) for paperless environment etc. ●



LAUNCH OF THE Y-3023 DUNAGIRI, PROJECT 17A FRIGATE BUILT BY THE GARDEN REACH SHIPBUILDERS LIMITED (GRSE), IN KOLKATA ON JULY 15, 2022



'Rolls-Royce ready to Partner with India for Combat Engine Development'

A co-development programme that leads to capability creation and would allow India to look at opportunities to accelerate the development of its defence ecosystem

ALEX ZINO,
EXECUTIVE VICE PRESIDENT – BUSINESS DEVELOPMENT AND
FUTURE PROGRAMMES (DEFENCE), ROLLS-ROYCE

As the world witnesses shifting geopolitical dynamics, India is looking to take a more prominent role on the international stage. The country is focused on strengthening its defence systems and has also taken strides to pursue its vision of self-reliance in defence. The 'Atmanirbhar Bharat' clarion call is encouraging the sector to strengthen manufacturing capabilities, as well as indigenise defence technologies. In line with this, India is pursuing the combat engine programme, which would give an operational boost to the Indian Air Combat Capability and catapult India's military prowess, to become a nation capable of developing and designing technologies that only a handful of nations can do today.

As we have seen with other combat air programmes across the globe, collaboration is key. Exploring joint design and development programmes can help accelerate transfer of capabilities and transfer of technology. This capability development is not only about the theoretical transfer of technology and know-how, but the practical transfer of know-why, which will ensure long-term benefits for India including customisation, autonomy and capabilities for future programmes.

STRIKING THE RIGHT COLLABORATION IS KEY TO SUCCESS

For such a co-development programme to be a success collaboration with like-minded partners, who are committed to true self-reliance through co-creation of both technology and capability, will be key. The United Kingdom (UK) is a strong and natural ally for India in pursuing such a goal, with both nations having previously expressed their commitment to greater defence cooperation in strategic areas.

The UK has successfully demonstrated its ability to collaborate with partner nations for such joint programmes, and its alliances with countries like France, Germany and Italy in Europe and recently with Japan are a testimony to this.

A co-development programme that leads to capability creation in India will enable control of the manufacturing and production stages of the life cycle. This in turn would allow India to look at opportunities to accelerate the development of its defence ecosystem through collaboration with key global players. Such a programme, in collaboration with the UK, would also increase India's competitiveness in the global arena opening the opportunity for exports. When technology is

developed in India, for India and the global market, and the know-why rests within the country, there is a great opportunity for it to leapfrog its status as a supplier to the global market. At Rolls-Royce, we are committed to supporting the self-reliance vision of India and are keen to enable co-development opportunities in defence.

ROLLS-ROYCE: COMMITTED TO INDIA'S INDIGENISATION GOALS

Rolls-Royce has pioneered several initiatives in India, from powering the first aircraft of the Indian Air Force to the first Make in India story, having delivered the first whole engine technology transfer agreement and first licensed production of Rolls-Royce engines in India along the way. We are committed to building on this foundation, with support to India's combat engine development programme a natural next step.

With a rich history of engine technology development, Rolls-Royce is a global leader particularly in the gas-turbine based aero-engine market. The company has a powerful track record of certifying new aeroengines every 18 months over the last two decades, a significant feat considering the complexity, technology and expertise required.

Today, we are well-positioned in the country with a strong ecosystem of Indian partners, talent, supply chain, digital, service delivery and manufacturing capabilities, as well as global expertise in co-development with other nations. We are building a pipeline of talent in India, both in-house and through our partners. We are well-equipped to support the programme with technological expertise as well, as a proven history of capability creation for the supply chain and manufacturing ecosystem to meet global standards. It is only a matter of time before such technology development will leapfrog 'Make in India' from catering to the domestic defence needs to 'Design and Develop in India for the World'.

INDIA AND THE UK: COLLABORATING TO ACHIEVE A SHARED VISION

Both India and the UK have previously publicly committed to deepen defence cooperation as a key pillar of the India-UK Comprehensive Strategic Partnership,

and to explore opportunities for defence collaboration for co-development and co-production of critical military technologies. Within Rolls-Royce we see this as a positive step forward and a platform from which to explore collaboration for combat engine development, that will not only enable technology creation in-country, but will also enable India to gain strategic autonomy in defence security. With our commitment to supporting India's defence indigenisation goals, we are looking forward to continuing our important partnership with our Government and industry stakeholders to explore opportunities in this space. ●



(TOP) HAVING THE RIGHT COLLABORATION IS KEY TO A SUCCESSFUL COMBAT AIR PROGRAMME
(ABOVE) ROLLS-ROYCE IS COMMITTED TO SUPPORTING THE SELF-RELIANCE VISION OF INDIA
AND ARE KEEN TO ENABLE CO-DEVELOPMENT OPPORTUNITIES IN DEFENCE

IAI's Heron MK II

On Target Under Extreme Weather Conditions



Our Experience – Your Winning Solution

As a multi-mission system, Heron MK-II is built for heavy lifting and carrying multiple payloads. With up to 45-hour endurance and a 35,000+ operational ceiling, flying day, night, and in adverse weather, Heron MK-II uses multiple datalinks, satellite communications, a high level of automation, and remote operation capability, enabling you to focus on your mission. As IAI's newest Unmanned Aerial System (UAS), Heron MK-II, is backed by over 2,000,000 operational UAS flight hours, providing an all-in-one system fulfilling all your mission needs.

www.iai.co.il • info.malat@iai.co.il

Meet us at
DefExpo 2022
Hall 7, Booth 11-12

