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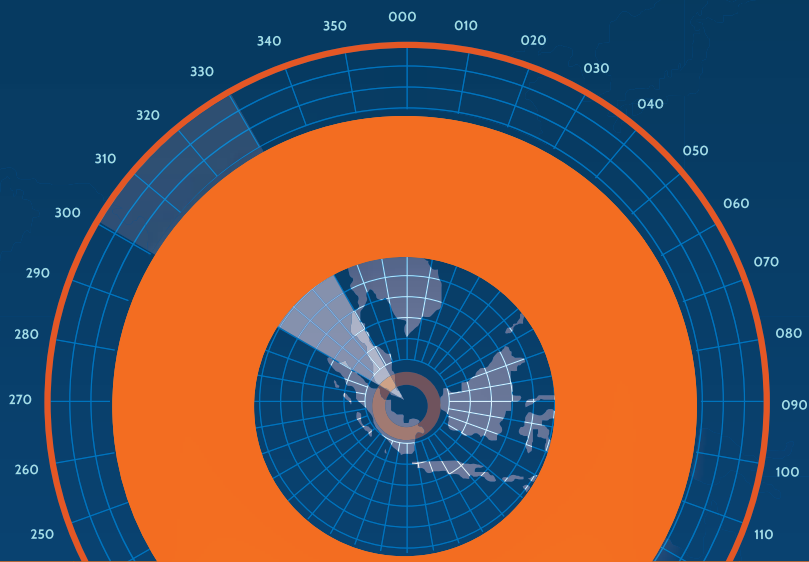


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EDITORIAL

Aero India Echoes the Capabilities of 'New India'



Radiating the rise of a strong and self-reliant 'New India' and displaying the nation's growth in aerospace and defence industry, the latest and biggest ever edition of Aero India 2023, the premier biennial expo, was organised by the Ministry of Defence in February in Bengaluru. The expo, held at a time when the global aerospace and defence industry have recovered from the impact caused by the pandemic, took a big step in promoting India's Atmanirbharata by showcasing indigenous equipment/technologies and

forging partnerships with foreign companies.

Held in line with 'Make in India, Make for the World' vision for a secure and prosperous future, Aero India 2023 was undoubtedly a shining example of India's growing capabilities and the presence of more than 100 nations showed the trust that the entire world saw in India. The participation of more than 800 exhibitors including Indian MSMEs and startups along with the well-renowned companies of the world was a testimony to the immense potential of the Indian industry.

The Bandhan ceremony forged and renewed partnerships between business entities. The event witnessed the forging of 266 partnerships, including 201 MoUs, 53 major announcements, nine product launches and three ToTs, worth around Rs.80,000 crore.

The success of the event was synonymous with the Prime Minister Narendra Modi's words that the new India of the 21st century will neither miss any opportunity nor will it lack in effort and the nation will take rapid strides to be included among the largest defence manufacturing countries. Over these years, India has emphatically embarked on the path of self-reliance and indigenisation in defence with focus on 'Make-in-India' and 'Atmanirbhar Bharat'.

However, in order to achieve the PM's vision, private sector and investors will have to play a big role in pushing Atmanirbharata and defence exports. There is a lot of ground yet to be covered in terms of enhanced R&D development of new technology products and the scale of production. There is a paradigm shift in India's defence exports but a quantum jump in the exports is only possible if Indian industry is ready to make and export large weapon systems and platforms.

Enhancing the participation by domestic private industry in design, development and manufacture of aerospace & defence products is inevitable in boosting production and exports. Investment in technology and product development and expansion of facilities are vital for creating higher capability and capacity in the Private Sector. At the same time synergy among the Private Sector Corporates and Public Sector and the large and capable Indian SME Supply Chain, with affirmative action for Co-operation and sharing of resources to reduce the capex requirement for growth is essential. The government's focus should be on these while promoting the 'Brand India'.

Dr C G Krishnadas Nair
Honorary President, SIATI

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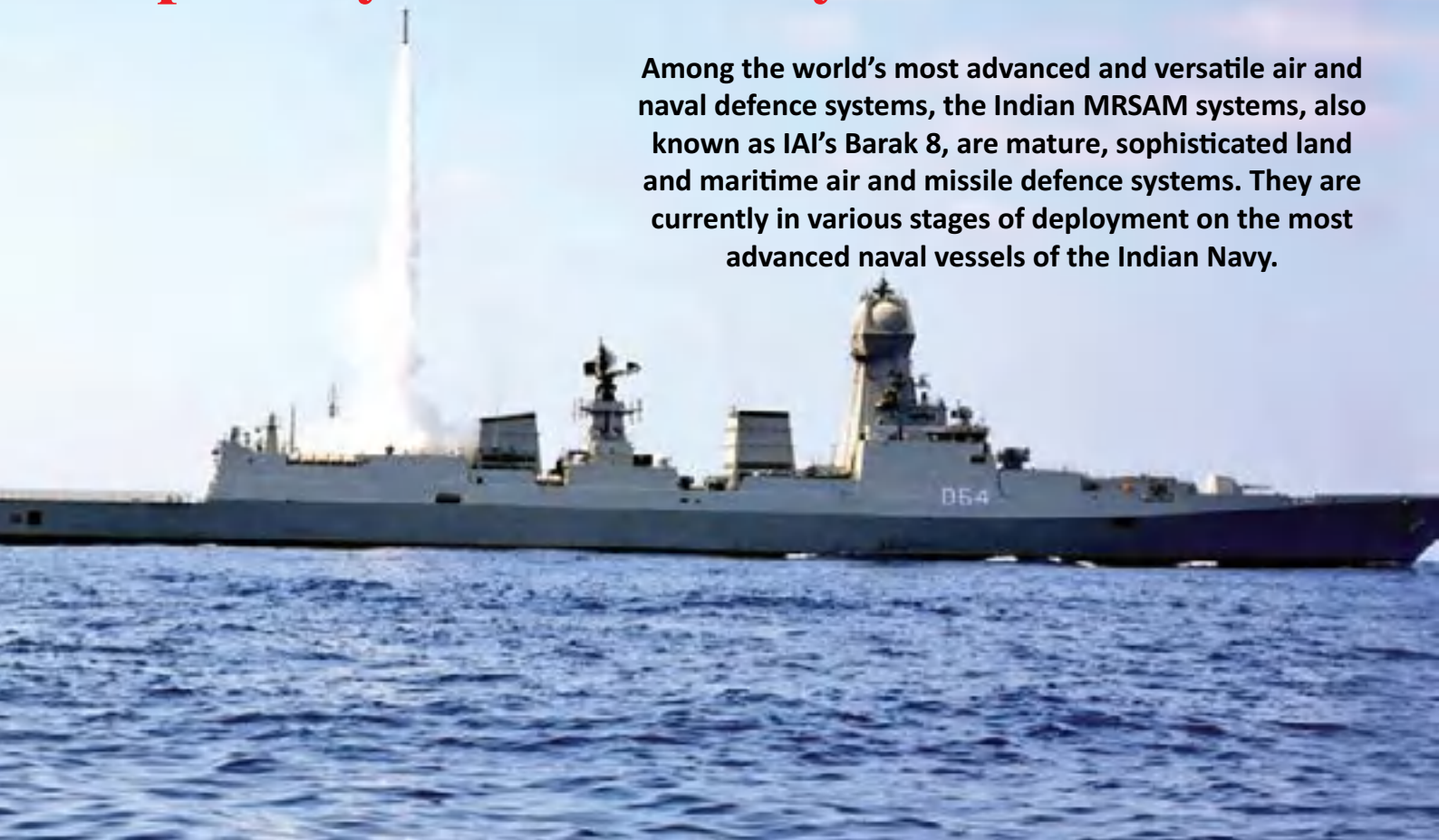
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MRSAM – Comprehensive Defence Capability Paves the Way for Self Reliance

Among the world's most advanced and versatile air and naval defence systems, the Indian MRSAM systems, also known as IAI's Barak 8, are mature, sophisticated land and maritime air and missile defence systems. They are currently in various stages of deployment on the most advanced naval vessels of the Indian Navy.



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The system can defeat a broad spectrum of aerial threats encountered at sea and on land. MRSAM targets range from air-breathing aircraft and missiles (fighter aircraft, guided and cruise missiles), rotary-wing aircraft (helicopters or drones), gliding and ballistic missiles, or other aerial capabilities that may evolve in the future.

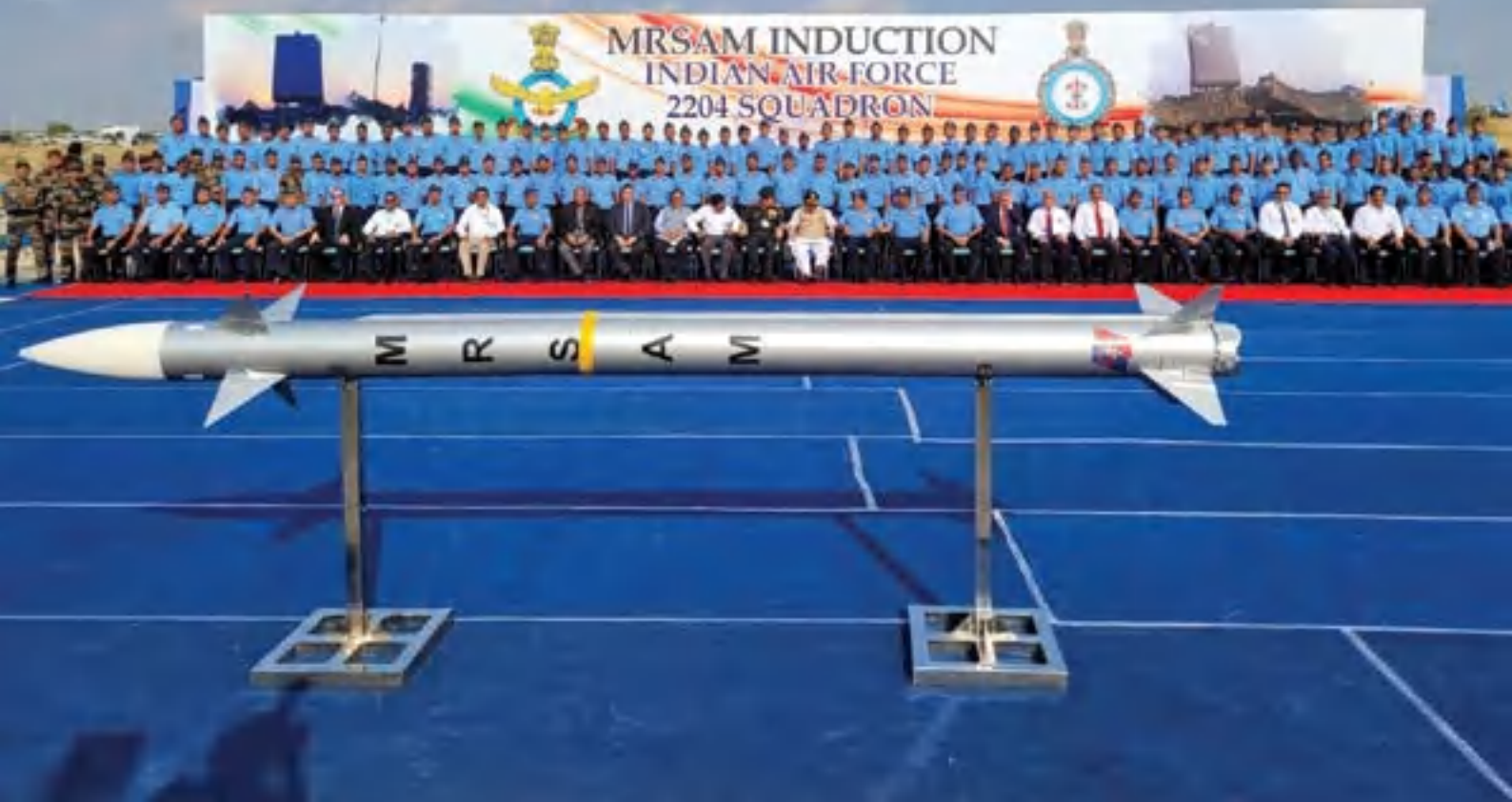
The MRSAM was developed in cooperation between DRDO and IAI as a modular surface-to-air missile system. It integrates advanced sensors, computing systems, algorithms, datalink communications, and interceptors into a complete air and missile defence system and network. These capabilities have been demonstrated in numerous flight tests and intercepts. The Indian



Navy, Air Force, and Army performed many of these tests without external support, attesting to the systems' maturity and the operators' readiness.

Unlike legacy air defence systems that were inflexible and became obsolete in the face of new threats, MRSAM was jointly designed and developed by IAI and DRDO as a modular and evolutionary system that can integrate with different radars, launchers, and missiles and optimize to meet evolving threats. In India, this capability has been demonstrated in the fielding of varying system configurations tailored for the Navy, Air Force, and Army, along with the introduction of interceptors that significantly increase the range and effectiveness of the system.

The principal sensor of the MRSAM system is the MFSTAR, an advanced multi-face digital phased array radar developed by IAI\ELTA. This advanced modular system enables software-based upgrades and enhancements to address evolving threats and challenges over the system's lifetime. Another core system is the smart launcher, designed to operate several types



of interceptors. MRSAM also employs a battle management system designed for efficient upgradability and modernization. With autonomous and network-based capabilities, the system is a key to MRSAM agility. The interceptor used in the MRSAM system is capable of intercepting targets at a range of 70 km. These missiles use an advanced active RF seeker optimized against high manoeuvring and low-radar signature targets. The system will also be able to use boosted variants of these interceptors that more than double the missile's range.

Impressive as it is when operating in stand-alone missions, MRSAM has the unique capability of working in a group as part of a naval Joint Task-Force Coordination (JTC). This mode of operation provides the task force with a cooperative engagement capability currently operated only by the US Navy. JTC enables task force members to contribute to and share a common situational picture, receive target allocations and tracks from the command ship, and perform intercepts in a network-centric operation. Under the JTC concept, the sky picture and early warning

are processed and synthesized at the task force level. The unified view allocates targets and missions to the different task force members. This coordination ensures optimal use of interceptors, eliminates 'double booking' of targets, and guarantees vessels remain armed to continue the mission. JTC has already been implemented and tested with operational MRSAM operated by the Indian Navy.

The MRSAM program development was shared between the team members in India and Israel. Reaching the program maturity, a growing share of the production is being awarded to Indian suppliers based on the technology and know-how gained.

The system comprises three building blocks – sensors, interceptor missiles, and a network centric Battle Management Center (BMC) providing an efficient air and missile defence for the forces. With MRSAM becoming operational with the Navy, Air Force, and soon with the Indian Army, the prime contractor BEL, missile producer BDL and system integrator IAI are gearing up to streamline their service to support the military over the program's

lifetime. In parallel, the partners are pursuing growth opportunities for the systems and their capabilities, addressing future needs, evolving challenges, and new opportunities.

As part of this evolving process, IAI established a new company in India - Services Private Limited (SPL), to provide local services and support for the MRSAM systems. SPL manages the logistics and technical expertise to service its products and aggregate the activities of other establishments, thus offering the customer a single point of contact, integrating all support services under one roof. As the design authority for the entire system, IAI supports these complex systems by coordinating activities, scheduling operations, training and providing technical experts and equipment, and stocking spare parts, enabling all partners to comply with the committed service level. In the future, the company will be able to expand the scope of and broaden the services it provides to Indian customers and beyond, in the spirit of Atmanirbhar Bharat - self-reliance and Make to the world.

India to Procure Indigenous Defence Hardware Worth Rs 70,500 Crore

- Defence Acquisition Council approves proposals worth Rs 70,500 crore for the Armed Forces and Indian Coast Guard under Buy (Indian-IDDM) category
- BrahMos missiles, Shakti EW systems and Utility Helicopters-Maritime, valued at Rs 56,000 crore, cleared for Indian Navy
- Long Range Stand-Off Weapon for the Indian Air Force gets the nod; To be integrated on SU-30 MKI aircraft
- 155mm/52 Caliber ATAGS, along with High Mobility and Gun Towing Vehicles, to be procured for Indian Army
- Indian Coast Guard to get Advance Light Helicopters MK-III from HAL
- Over Rs 2.71 lakh crore worth of procurement cleared in FY 2022-23; 99% to be sourced from Indian industries

By Sunny Jerome

Defence Acquisition Council (DAC), India's top weapons procurement body under the chairmanship of Defence Minister Rajnath Singh, has cleared the decks for buying indigenous military hardware worth Rs 70,500 crore, including supersonic missiles, artillery guns, maritime helicopters and a long-range standoff weapon for the Indian Air Force's Sukhoi-30 fighters.

The Acceptance of Necessity (AoN) accorded by the DAC for capital acquisition is under Buy Indian-IDDM (Indigenously Designed, Developed and Manufactured) — a new category of procurement that signifies a major push for self-reliance in the defence manufacturing sector. Under India's defence procurement rules, the Council's AoN is the first step towards buying military hardware.

The Defence Ministry said the government will spend a large share of the money on boosting the Navy's capabilities. Indian Navy proposals approved by DAC constitute more than Rs 56,000 crore, that include indigenous BrahMos missiles, Shakti electronic warfare

systems, utility helicopters for maritime operations, among others.

The Council accorded AoN for 225 BrahMos missiles, Shakti electronic warfare systems and 60 marine utility helicopters for the navy, around 307 advanced towed artillery gun systems (ATAGS) for the army, the long-range stand-off weapon for the Indian Air Force's Sukhoi-30 fighters, and nine advanced light helicopters for the coast guard.

The BrahMos missiles being acquired are the extended range ones. While this additional procurement of BrahMos missile system will enhance the maritime strike capabilities and anti-surface warfare operation, the addition of utility helicopters will multiply the operational readiness of the Indian Navy in the domain of search and rescue operations, casualty evacuation, humanitarian assistance disaster relief etc. Similarly, Shakti EW systems will equip and modernise the frontline naval ships to counter any naval operations by the adversaries.

Accordance of AoN for medium speed marine diesel engine under Make-I category is a significant step as, for the first time,

India is venturing into the development and manufacturing of such engines indigenously to achieve self-reliance and leverage the capabilities of the industries towards the goal of 'Aatmanirbhar Bharat'.

The Defence Ministry said the AoN for Medium Speed Marine Diesel Engine under Make-I category is significant as it marks the first time India is venturing into development and manufacturing of such engines. "To keep pace with emerging technologies and counter adversaries in the western and northern front, the necessity of the new weapons and its integration with the delivery platforms was felt by the Government," the statement said.

To achieve the same objectives, the DAC accorded approval to IAF's proposal for Long Range Stand-Off Weapon (LRSOW), which will be indigenously designed, developed, and integrated on SU-30 MKI aircraft.

For Artillery modernisation, in addition to the ongoing Dhanush Gun System and K-9 Vajra-T Gun System, AoN for procurement of 155mm/52 caliber advanced towed artillery gun system (ATAGS) along with high mobility vehicles (HMVs) and gun towing vehicles



(GTVs) for the Indian Army was accorded by the DAC.

The Defence Research and Development Organisation (DRDO) began the ATAGS project in 2013 to replace older guns with modern ones. It partnered with two private firms, Bharat Forge Limited and Tata Advanced Systems Limited, for manufacturing the gun. It has a range of 48 km.

A prototype of the gun was used for the ceremonial 21-gun salute for the first time at the Independence Day function at Red Fort last year, along with British guns traditionally used for the event. Prime Minister Narendra Modi had in his speech made a special mention of the indigenous artillery gun as he called for furthering self-reliance in different sectors.

DAC also accorded AoN for procurement of advance light helicopters (ALH) MK-III from Hindustan Aeronautics Limited (HAL) for the Indian Coast Guard. The helicopter will be able to carry a suite of surveillance sensors which will enhance the surveillance capabilities. It will also give full night capability and instrument flight rules (IFR)

capability for operations of the Indian Coast Guard.

The total AoN granted Capital Acquisition in the Financial Year 2022-23 is over Rs 2.71 lakh crore, out of which 99% of the procurement will be sourced from Indian industries. Such quantum of indigenous procurement will galvanise the Indian industries towards achieving the goal of 'Aatmanirbhar Bharat'.

'Make-I' is category of capital acquisition in the Defence Procurement Procedure (DPP), and the cornerstone of the Make in India initiative that seeks to build indigenous capabilities through the involvement of both public and private sector.

'Make-I' refers to government-funded projects while 'Make-II' covers industry-funded programmes. Another sub-category under 'Make' is 'Make-III' that covers military hardware that may not be designed and developed indigenously, but can be manufactured in the country for import substitution, and Indian firms may manufacture such hardware in collaboration with foreign partners.

The Defence Ministry had signed recently

two separate contracts with Hindustan Aeronautics Limited (HAL) and Larsen & Toubro for 70 HTT-40 basic trainer aircraft and three cadet training ships, respectively, with the orders worth 9,900 crore set to boost self-reliance.

Apart from creating a separate budget for buying locally made military hardware, the government has taken a raft of steps to promote self-reliance in the defence manufacturing sector including increasing foreign direct investment (FDI) from 49 per cent to 74 per cent, and notifying hundreds of weapons and systems that cannot be imported.

The Defence Minister had announced at the recently held Aero India 2023 in Bengaluru that India had earmarked 75 per cent of this year's defence capital procurement budget for buying weapons and systems from local manufacturers, with the move aimed at unlocking new opportunities for achieving self-reliance targets and ramping up the country's defence exports.

The share of the domestic sector in the defence budget was never higher. India set aside 68 per cent of the military's capital



acquisition budget for making indigenous purchases in 2022-23, 64 per cent in 2021-22, and 58 per cent in 2020-21. Around Rs 1 lakh crore has been set aside for domestic procurement this year, compared to Rs 84,598 crore, Rs 70,221 crore and Rs 51,000 crore in the three previous years.

The Defence Minister had earlier indicated that India could bring more weapons and systems under an import ban, and manufacture them in the country to give

a new push to self-reliance. So far, four 'positive indigenisation lists' have barred the import of 411 weapons and systems.

The Defence Procurement Procedure focuses on institutionalising, streamlining and simplifying defence procurement procedure to give a boost to 'the Atmanirbhar Bharat' initiative of the Government of India, by promoting indigenous design, development and manufacturing of defence equipment, platforms, systems and sub-systems. 'Make'

procedure has also been refined to ensure increased participation of the Indian industry. Enhancing the role of Micro, Small and Medium Enterprises (MSMEs) in defence sector is one of the defining features of DPP. In order to promote indigenous design and development of defence equipment, DPP 2016 had introduced the Buy-IDD (Indigenous Designed and Manufactured) Developed category of acquisition and accorded it the top most priority. ■





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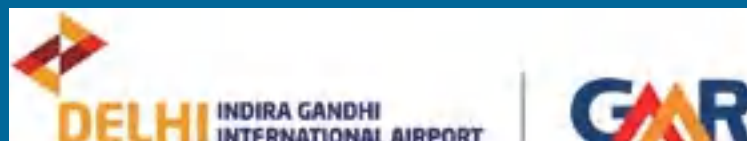
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DRDO has been working on empowering the nation with indigenous defence technologies and systems, with focus on developing the defence R&D ecosystem in the country says Dr Samir V Kamat, Secretary, Department of Defence R&D and Chairman, DRDO, in this special interview.

Dr. Samir V Kamat

*Chairman, DRDO & Secretary Defence R&D
Ministry of Defence, Govt. of India*

DRDO celebrated its 65th Foundation Day on January 1 and you commended the fraternity for achieving a number of milestones in 2022. How much productive was 2022 for DRDO when the industry survived the impact of the Coronavirus pandemic?

Year 2022 has been a very good year for the nation as well as DRDO. Several systems developed by DRDO have been delivered, handed over to or inducted by the users. These include: Three firing units of Medium Range Surface to Air Missile for IAF, Shakti EW system, InfraRed Signature Suppression System for ships, 1000lb Thermobaric bomb, Brake Parachutes for Su-30 fighters aircraft, Commanders Thermal Imaging Sight with Laser Range Finders for T-90 Tank, Dhvani Automated Sonar Trainer, Four types of Radiation Contamination Monitoring Systems, MIG-29 Aircrew Helmet & Pressure breathing Oxygen Mask.

Acceptance of Necessity has also been accorded by Defence Procurement Boards and Defence Acquisitions Council for induction of several DRDO developed systems. Some of the notable systems include: Sarang ESM system, Light Tank, Tactical Advance Range Augmentation Kit (TARA), Long Range Guided Bomb (LRGB)

Gaurav, Naval Anti Ship Missile-Medium Range (NASM-MR), Air surveillance radar for NGMV, Low Level Transportable Radar (LLTR) Ashwini, New Generation Anti Radiation Missile (NGARM), Pralay Guided Extended Range Rocket Ammunition for Pinaka, Self-Propelled Mine Burier, Infantry Combat Vehicle-Command, Anti-Personnel Fragmentation Mine 'Ulka', Infantry Floating Foot Bridge, Bridge Laying Tank (BLT) T-72 and ACADA.

DRDO has been working on empowering the nation with indigenous defence technologies and systems, with focus on developing the defence R&D ecosystem in the country and strive to realise Prime Minister's vision of 'Aatmanirbhar Bharat'.

India has achieved a considerable level of self-reliance in critical defence technology but there is still a long way to go. What are DRDO's plans to increase the pace of attaining Atmanirbharata in defence?

DRDO has taken several initiatives to strengthen the indigenous defence R&D ecosystem in the country. DRDO is focusing on working in products and technologies which are at low readiness level. While technology which has now matured is being handed over to industries, many industries are now working with DRDO as Development Cum Production Partner (DcPP). Young scientist laboratories of DRDO are dedicatedly working in futuristic technologies namely Artificial Intelligence, Quantum Technologies, Cognitive Technologies, Asymmetric Technologies and Smart Materials. DRDO has established 15 Centres of Excellence in collaboration

with various academia institutes all over the country to develop critical technology for meeting futuristic requirements of Armed Forces. DRDO also funds research under its various Grant-in-Aid Schemes to undertake research in the fields of Aeronautics, Armaments, Naval and Life Sciences to strengthen funded research.

DRDO has also identified 108 systems and subsystems for designing and development by the Indian Industry only. All DRDO system laboratories have AI technology groups to introduce AI features in products under development.

Increasing defence export share is crucial for India considering its ambitions in the industry. How strong is DRDO's export business?

DRDO developed Defence products have created a lot of interest in many countries and have been exported too. Many products based on DRDO technologies have already been exported by DPSUs and Industry.

BrahMos Aerospace Private Limited (BAPL), the joint venture company of DRDO & NPOM, Russia has signed a contract with the Department of National Defence of the Republic of Philippines last year for supply of Shore Based Anti-Ship Missile System to Philippines. This contract will give further impetus to indigenous production of critical weapon system and ammunition with active participation of our industry. Previously, DRDO developed WLR Swathi was exported to Armenia. Many naval products developed by DRDO like Torpedoes, Sonars have been exported to the neighbouring countries.

Akash Missile System has been recently

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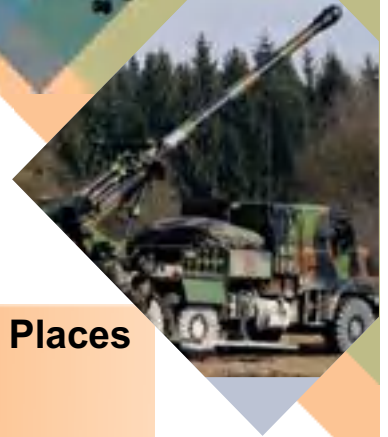
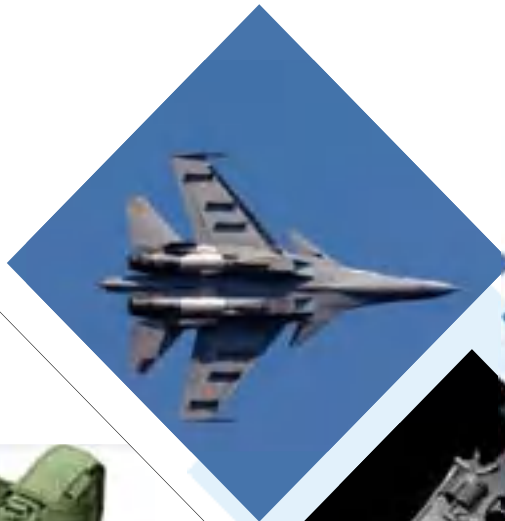
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cleared for export. More export opportunities are emerging for Weapon Locating Radar, Torpedoes, Sonars, etc.

DRDO has also come out with a compendium on "DRDO Products for Export" to give impetus to export. This will provide the necessary and handy information about the DRDO products, which are ready for export. We will see tremendous increase in defence exports in next few years.

Acceptance of Necessity (AON) has been accorded by the Defence Procurement Boards and Defence Acquisitions Council for induction of several DRDO developed systems. Could you elaborate?

Defence Acquisition Council (DAC) in January this year accorded Acceptance of Necessity (AoN) for procurement of HELINA Anti-Tank Guided Missiles, launchers and associated support equipment which will be integrated on the Advanced Light Helicopter (ALH) and will further strengthen the capability of Indian Army. Besides, DAC also accorded AoN for procurement of VSHORAD (IR Homing) missile system under design and development by DRDO. Procurement of VSHORAD, as a robust and quickly deployable system, will further strengthen the Air Defence capabilities.

Prior to this, in December 2022, the DAC headed by Hon'ble Raksha Mantri

Shri Rajnath Singh had accorded approval for AoN of Futuristic Infantry Combat Vehicles, Light Tanks, Naval Anti-Ship Missiles, Multi-Purpose Vessels, new range of missile system, Long Range Guided Bombs, Naval Anti-Ship Missiles etc., which will further modernise our Armed Forces and will provide substantial boost to the defence industry to achieve the goal of 'Aatmanirbhar Bharat'. The AoNs accorded will equip the Indian Army with platforms and equipment such as Futuristic Infantry Combat Vehicles, Light Tanks and Mounted Gun System providing a quantum jump to Indian Army's operational preparedness. Similarly, Indian Air Force will be further strengthened with enhanced lethal capabilities by induction of new range of missile system, Long Range Guided Bombs etc.

Several major systems developed by DRDO have either been completed or are in the final stages of user evaluation. Could you talk more about it?

Several major systems developed by DRDO have either been completed or are in the final stages of user evaluation.



These include Advanced Towed Artillery Gun System (TAGS), Third Generation Helicopter Launch Anti-Tank Guided Missile 'Helina', NAMIS (Tracked) and 'Nag' Anti-Tank Guided Missile, Quick Reaction Surface to Air Missile, Medium Range Surface to Air Missile, Mechanical Mine Layer (self-propelled), 84 mm Anti-Thermal/Anti-Laser Smoke Grenade, HEPF and RHE (Enhanced) Rocket Ammunition for Pinaka MRLS, 125 mm FSAPDS, Air Defence Fire Control Radar 'Atulya', Weapon Locating Radar for Mountains, V/UHF Manpack Software Defined Radio, P-16 Heavy Drop System, Portable Diver Detection Sonar System, Advanced Light Weight Torpedo, and Sea Water Purification Kit for Gaganyaan Mission.

Several other systems are also undergoing developmental trials. These include Electronic Warfare Systems for Naval platforms under the programme Samudrika, Phase-II Ballistic Missile Defence Interceptor AD-1 Missile, extended range version of BrahMos from Su-30 aircraft, Very Short Range Air Defence System, Naval Anti-Ship Missile-Short Range, Agni Prime, Vertical Launch-Short Range Surface to Air Missile (VL-SRSAM), Akash-New Generation, Man-Portable Anti-Tank Guided Missile (MPATGM), Enhanced Range Pinaka Rocket System, High speed expendable Aerial Target 'Abhyas', Small Turbo Fan Engine, Kaveri Dry Engine, WhAP-CBRN, Shatrughat and EW Systems for Plains and Desert Active Electronically Scanned Array Radar 'Uttam', Advanced Light Towed Array Sonar among others. It is expected that most of the systems under trials will be handed over to the users in the coming year.

What are the latest updates on the Electronic Warfare Systems for Naval platforms under the programme Samudrika, Naval Anti-Ship Missile-Short Range and Advanced Light Towed Array Sonar, which are undergoing developmental trials?

Programme 'Samudrika' will result in achieving hundred per cent indigenisation of Electronic Warfare fit onboard Indian Naval Platforms Electronic Warfare (EW) Systems for Naval platforms. The Programme SAMUDRIKA is undergoing developmental

trials. The programme aims at design and indigenous development of a family of Seven Electronic Warfare Systems meeting the requirements of Navy for different platforms viz., Ships, Helicopters and Aircrafts, with a firm commitment from Navy for quantity production and induction of these Systems.

Advance Light Towed Array Sonar (ALTAS) development is critical to underwater defence of the Indian Navy. This will enhance the Navy's capabilities to detect quieter enemy submarines underwater. It is useful in Anti-Submarine Warfare (ASW) operations and is the apt sensor for warships to locate silent submarines capable of launching high speed torpedoes. With NPOL emerging as a leading and high performing R&D laboratory working in the area of underwater surveillance systems, Sonar systems developed by it are being used in Indian Navy's frontline platforms for last few decades and many of them have entered into third and even fourth generation products.

Aiming to improve logistics for operations in the Himalayas DRDO has developed an unmanned aerial vehicle (UAV) recently. Could you talk more about it?

With an aim to carry out logistic operations in the Himalayan frontier, DRDO has developed an untethered multi-copter payload, an unmanned aerial vehicle (UAV). The multi-copter can carry out autonomous missions with waypoint navigation. The multicopter was exhibited by DRDO at recently held 108th Indian Science Congress in Nagpur, Maharashtra.

Could you talk about DRDO-Industry-Academia Centres of Excellence which are important in developing the defence R&D ecosystem in the country?

DRDO has established a total of 15 DRDO-Industry-Academia Centres of Excellence (DIA-CoEs) in collaboration with various academia institutes all over the country to develop critical technology for enabling futuristic requirements of Armed Forces. Currently, 867 projects are on-going with academia at a cost of Rs 1,183 crore. DIA-CoEs have been established to conduct directed research in advanced technologies for defence and security and to create a world-class research centre developing cutting-edge technologies. DRDO funds directed research through DIA-COE in the identified research areas. It will also make a major contribution towards 'Aatmanirbhar Bharat' in defence sector. ■

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BrahMos Steadfast to Propel India's Defence Exports



The landmark export deal with the Philippines and more countries showing interest in the missile have emboldened BrahMos Aerospace's resolve to further widen its footprint internationally. In an interview with Aeromag, Atul Dinkar Rane, Director General BrahMos, CEO and MD, BrahMos Aerospace, talks about how BrahMos leads from the front to realise India's target of achieving \$5 billion in defence exports by 2025.

Atul Dinkar Rane

Director General BrahMos, CEO and MD, BrahMos Aerospace

BrahMos Aerospace is set to conclude its silver jubilee celebrations. Could you share the major milestones over the glorious 25 years?

The India-Russia BrahMos JV embarked on the milestone 25th year of its formation in 2022 which coincided with India's 'Azadi Ka Amrit Mahotsav' commemorations. It has been an incredible journey for the JV company which has designed, developed and delivered one of the most powerful, state-of-the-art, unparalleled deterrent weapon to the Indian Armed Forces. The coming together of two scientific-technical institutions of eminence – DRDO and NPOM – redefined India-Russia strategic partnership and led to the development of the 'world-class' BrahMos weapon system. This highly successful Defence JV programme has no parallels in the world.

We have realised many successful moments and milestones in these 25 years, including delivering the supersonic cruise missile system to the Indian Navy in 2005, to Indian Army in 2007, and to the Indian Air Force in 2020. BrahMos is the only weapon in its class and calibre to have been operationalised in all three Services of Indian Armed Forces, making India the first and only country in the world to possess a 'Supersonic Cruise

Missile Triad'. The tactical weapon has been tested for a record number of times from frontline land, ship and air platforms and established an unbeatable record. The missile has validated its supremacy as the 'weapon of choice' for modern, network-centric warfare operations. The BrahMos JV has been leading from the front in the flagship 'Make-In-India' endeavours of defence indigenisation. Through the BrahMos 'Missile Industrial Consortium' (MIC), the JV has significantly widened India's defence & aerospace ecosystem and incorporated higher indigenous technologies, components and sub-systems in the versatile BrahMos.

In 2022, BrahMos became India's first full-scale major weapon system to enter the international arms market. On January 28, we signed a historic export contract with the Republic of Philippines to deliver shore-based BRAHMOS anti-ship weapon system to the Armed Forces of Philippines. It was a watershed moment for us.

Prime Minister Narendra Modi has set a target of achieving \$5 billion in defence exports by 2025 and BrahMos Aerospace aims high in exports by that time. How strong is your export business and what are the latest updates?

BrahMos has heralded a new chapter in India's defence exports front. It is the first weapon of such class and calibre to carve global footprint. The landmark export deal with the Philippines has emboldened our resolve to further widen our footprint internationally. There are several countries in the South East Asia, Middle East and Latin American regions which are strongly desiring to acquire the formidable BrahMos

weapon system for their Armed Forces. So, the supersonic cruise missile is definitely very strongly positioned to fulfil India's defence export aspirations. BrahMos Aerospace in fact now leads from the front to realise India's target of achieving \$5 billion in defence exports by 2025.

You have said that BrahMos Aerospace is capable of making hypersonic missiles and will be able to have its first such missile in five to six years. What are the latest updates?

We are very much capable of designing and developing the hypersonic variant of BrahMos missile. We are working on this front and are quite hopeful to achieve major breakthroughs in the coming years. BrahMos remains world's fastest tactical weapon having a top speed of Mach 2.8. We are now working on the more advanced BrahMos -NG (next-generation) variant which would have a higher speed of Mach 3.5. Then we are targeting to reach the 'ultra-high' speed which would be one of the defining features of hypersonic BrahMos -II. We intend to build 'technology clusters' in coordination with DRDO and NPOM along with our public & private sector defence industry partners and the academia to realise this ambitious goal of developing the hypersonic BrahMos missile variant in the next few years.

BrahMos will be taking part in NAVDEX 2023 in Abu Dhabi. What are the plans to explore business opportunities in the Middle East?

Some countries in the Middle East region have evinced interest in the BrahMos weapon system. We are offering all variants of



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BRAHMOS – land-based weapon complex, ship-based weapon complex, shore-based weapon complex and the air-launched cruise missile system – for export. Being a very versatile, flexible system, BrahMos can be seamlessly integrated on some of the military platforms of these countries (in the Middle East region). So, there are very strong business prospects for us in this region.

Could you talk about the latest updates of Brahmos-NG missile?

This new weapon is going to be a smarter derivative over its predecessor in terms of scale & size, speed, stealth and other parameters. BrahMos -NG would be designed for integration onto a wider number of modern frontline military platforms on land, sea, underwater and air. Its smaller and lighter dimensions would make it more agile and capable to undertake precision strikes from stand-off ranges against land and sea targets. We have started working on this new weapon variant and are planning to test the first prototype weapon in the next 1 to 2 years' time. The state-of-the-art BrahMos manufacturing centre being set up in Lucknow under the Uttar Pradesh Defence Industrial Corridor (UPDIC) project would cater to the series production of the new BrahMos -NG variant in the foreseeable future.

What is the current status of the manufacturing centre to come up in Lucknow, Uttar Pradesh as part of the UP Defence Industrial Corridor (UPDIC) Project? How will it boost your production and assembling capabilities?

This new unit is being set up to meet the growing demand for BrahMos. Work has been expedited with all necessary cooperation and support from the UP Govt and all other nodal agencies and officials associated with the project. We are quite

hopeful to complete all construction and installation work for the new dedicated manufacturing facility by 2024. Once fully ready, the Lucknow unit of BrahMos would roll out existing BrahMos weapon systems. Subsequently, this dedicated facility would cater to the serial production, integration and delivery of the advanced BrahMos -NG weapon in the coming years. The new unit, once operationalised, would significantly bolster our existing manufacturing capabilities.

How does BrahMos support the indigenisation efforts of India? What is the current rate of indigenisation?

BrahMos has remained at the forefront of 'Make-In-India' programme. The JV, based on a very unique 'Missile Industrial Consortium' (MIC) model, has in fact reinvigorated the entire defence industrial ecosystem of India. We have involved a large number of small, medium and large public & private defence sector firms, laboratories and institutions in the design, development, integration and production of BrahMos and its numerous components, sub-systems etc. In close coordination with DRDO, we have also indigenised several critical technologies and systems for the missile over the years. The rate of indigenisation is quite high which has reduced the missile's overall production, maintenance and operation costs. Additionally, the weapon's functional and operational efficacy have been enhanced with the infusion of more advanced technologies and features which have been validated during successful test firings conducted in recent times.

The Ministry of Defence signed a contract for acquisition of additional dual-role capable Surface to-Surface BrahMos missiles under 'Buy-Indian' Category. Could you talk more about it?



We will design and deliver the new dual-role BrahMos surface-to-surface missiles (SSMs) for deployment on the future frontline maritime stealth combat platforms of Indian Navy. The new weapon variant would have enhanced features for superlative performance over its predecessor. It would also have higher indigenous content in terms of technology and other systems/sub-systems.

What are the immediate goals ahead for Brahmos Aerospace? Could you share your vision for the company during your tenure?

The immediate goals include design & development of new, advanced BrahMos -NG missile variant. Work on this front has gained momentum and we are moving quite swiftly to test the first prototype weapon soon. The other priority area is to incorporate advancements in terms of technology and other indigenous features to make BrahMos even more lethal for our Armed Forces. Series production and swift delivery of BrahMos air-launched cruise missile system to the Indian Air Force is also going on in parallel. Then, at the exports front, we want to take forward the export potential of BrahMos to newer frontiers after signing the historic export deal with the Philippines in 2022. My vision, therefore, is centred on the organisation's overall growth, expansion and consolidation strategies in the longer run.



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Haryana Aims to be a Leading Hub in Aerospace and Defence



With its Aerospace and Defence Production Policy, Haryana aims to attract investment of US\$ 1 billion over the next five years with a focus on promoting industrial development in the aerospace and defence sector and creating a complete ecosystem for the development of the sector. The plan is to establish Haryana as the leading aerospace and defence hub of the country by creating employment opportunities for about 25,000 people. "Haryana is a leader in India in many sectors including MRO, automotive etc. We aim to be a strong leader in aerospace and defence sector too. We intend to increase our presence in aerospace and defence manufacturing sector too," said Dushyant Chautala, Deputy Chief Minister, Haryana. Speaking to Aeromag, he talks about the state's ambitious growth policies in the aerospace and defence sector and the plans to attract investments.

Dushyant Chautala
Deputy Chief Minister, Govt. of Haryana

Could you talk about various initiatives by Haryana government to foster growth in aerospace and defence sector?

Haryana has taken numerous steps in this regard over the last three years. We are developing one of the largest airports in the country at Hisar. The construction of Hisar airport as an Integrated Aviation Hub, includes the construction of a cargo railway line, in addition to a passenger line near Raipur.

There are two FTOs being run by our government at Pinjore and Karnal. We have India's only sky-diving facility at Mahendragarh. The state government has handed over 25 acres of the land in Gurugram to the Centre for the development of a heli hub as a joint venture with Pawan Hans. The heli-hub has been envisioned as the first of its kind in the country with all aviation facilities for choppers at one place, and it will have many aviation facilities like heliport, hangers, repairs and other related services.

The government has recently released Haryana Aerospace and Defence Policy to support the growth in the sectors. The policy is in alignment with Haryana Enterprise and Employment policy (HEEP 2020) with special focus to support the industry urging more investment in the state's aerospace and



defence sector

The policy envisages harnessing Haryana's inherent strength in auto components and automobile manufacturing sector. The objective of the policy is to attract investment of US\$ 1 billion over the next five years with a focus on promoting industrial development in the aerospace and defence sector and creating a complete ecosystem for the development of the sector and to establish Haryana as the leading aerospace and defence hub of the country by creating employment opportunities for about 25,000 people.

We are also working on a drone production policy with the aim of tapping the potential in UAV industry. The state aims to be a home to more defence and aerospace production companies, especially in cargo, MROs and

passenger traffic.

What are the incentives on offer in Haryana's industry sector?

There are many incentives for companies and those include stamp duty refund, electricity subsidy, state GST refund etc. The government is giving single window clearance in the industrial sector.

The financial incentives offered under Haryana Aerospace and Defence Production Policy are the following. 100% of net SGST will be reimbursed for 10 years in D category blocks to the extent of 12.5 % of FCI. 75% of the net SGST will be reimbursed for 8 years in C category blocks. 50% of the net SGST will be reimbursed for 7 years in B category blocks.

The aerospace and defence units in B, C and



D blocks will be eligible for reimbursement of 100% stamp duty on sale/lease deed after commencement of commercial production within 5 years from the date of purchase of land. There is 100% waiver in electricity charges for 10 years in B, C and D blocks.

A credit guarantee scheme will be offered to students pursuing aviation/aerospace related course in higher education. In order to facilitate research and innovation in the state, the units registered with the Department of Scientific and Industrial Research will be provided financial assistance @ 50% of the project cost subject to a maximum of Rs. 50 crore.

We are a leader in manufacturing and contribute to around 70% of India's automobiles- especially heavy duty vehicles, cars, tractor, and two-wheelers-manufacture. There is so much of untouched and unexplored potential and the government intends to tap it through industry-friendly initiatives.

Could you talk about Haryana's startup sector? What are the initiatives to nurture startups and MSMEs?

Haryana has a vibrant and industry-friendly startup ecosystem. There are around 250 Fortune 500 companies in Gurugram. Moreover, top 10 startups like Delhivery recognised by the GOI and globally now have their presence in Haryana. More startups are coming to the state.

We recently launched Haryana's startup

policy to support new startups and universities with incubation centres. It aims to boost and nurture the vibrant startup ecosystem in the state and help entrepreneurs at different stages.

Under the startup policy, a business entity recognised as a startup by the Department for Promotion of Industry and Internal Trade (DPIIT) under the Union ministry of commerce and industry up to a period of 10 years from the date of its incorporation/ registration and with an annual turnover not exceeding Rs 100 crore and being based in Haryana will be eligible to avail fiscal and non-fiscal benefits.

The fiscal incentives to incubators include capital grant of up to Rs 2 crore to government host institutes and up to Rs 1 crore to private host institutes for setting up of incubation centres. A financial assistance of up to Rs 10 Lakh per incubator for existing incubators in universities and other government institutions for upgrading their facilities.

Connectivity is an important aspect when it comes to industrial prosperity. How well connected in Haryana?

Haryana is very well connected via road, rail and air. The Delhi airport is closer to Haryana than it is to Delhi. Once our new airport in Hisar is operational, it will be a big boost to cargo and passenger operation.

The aviation hub at Hisar will become fully operational from March next year, giving

Hisar air connectivity with Amritsar, Srinagar, Jaipur, Indore, Ahmedabad, Agra, Varanasi and other places. A study will be conducted to see how our heli-hub can be connected with other places at a distance of two hours. Besides, the chopper traffic from Delhi's IGI airport could be diverted to this proposed heli hub in Gurgaon. It will be a one stop centre for North India's for helicopter connectivity.

How strong is Haryana's capabilities in MRO services?

The government aims to make Haryana a leading MRO hub (maintenance, repair and overhaul) in north India in the field of aerospace and defence equipment production. It will be beneficial for the civil and defence aircrafts and will also reduce the maintenance cost for all airlines.

We now have 7 major MROs facilities operating in the state and we intend to invite more companies. India's air connectivity is getting improved and there is a huge increase in the number of aircraft. They should not go abroad for MRO service when we have the best equipped-facilities and skilled labour along with easy availability of spare parts.

Being the Deputy CM, what is your vision for Haryana?

Haryana is a leader in India in many sectors including MRO, automotive etc. We aim to be a strong leader in aerospace and defence sector too.

Building a Better and Futuristic Karnataka



The proposed investment target of Rs.50000 crores in five years in Karnataka, which is an aviation hub, will undoubtedly help solidify its position further. The state's robust ecosystem in aerospace and defence sector is supported by a thriving social infrastructure. Speaking to Aeromag, Dr. Murugesh Nirani, Industries Minister, Government of Karnataka, said that Karnataka recognises the importance and the role of new-age tech in building a better and futuristic tomorrow.

Dr. Murugesh Nirani

Industries Minister, Government of Karnataka

Dr. Nirani, Karnataka has made major progress in attracting investments in industry in the last couple of years. What have been the key factors which have helped?

To ensure that we continue to maintain our leadership position and sustain growth, the Govt. of Karnataka has taken several measures to enhance investor friendliness in the state. The Industries Facilitation Act was amended, and Affidavit Based Clearance (ABC) System has been introduced. The amended act enables industries to start operations without obtaining approvals from different departments like trade licenses, building plan approvals, etc.

Karnataka state has 10 clusters established under Micro Small Enterprise Cluster Development Programme. These are in addition to other product-specific clusters available to a larger set of investors, e.g., Aerospace & Defence Park, EV Park, Consumer Durable Goods Park, Bulk Drug Park, etc. Professional consultants/developers such as L&T, Aequus have been entrusted with parts of cluster development efforts. Multiple initiatives under the umbrella of decriminalisation of laws have also been undertaken. The programme team reviewed 286 State Acts and listed

imprisonment clauses for Acts that have relevance to businesses.

Various structural interventions have been identified including Hybrid funding model, tiered pricing, Plug & Play Setup, Private Land Compendium, etc. Recently Karnataka successfully concluded Invest Karnataka 2022 – Global Investors Meet and received commitments of INR 9.8L Cr from investors across the world across sectors.

In the aerospace and defence sector, the state has attracted several key global players to make Bengaluru and Karnataka its home. What attracts companies? Is it skilled manpower availability or the fact that several aviation and aerospace giants like HAL, NAL, and ISRO make Karnataka a preferred destination for companies?

Karnataka has a strong ecosystem for the aerospace & defence sector, with several leading players present in the state. 67% of all aircraft & helicopters manufacturing for defence services is done in the state. Moreover, Karnataka contributes to 65% of the country's aerospace related exports from India. Our A&D policy offer the best-in-class incentives tailored for the requirements of each key sub sector.

As per the A&D Policy, ultra-mega enterprises (investment between INR 500 Cr & INR 1,000 Cr) located in Zone 3 will be eligible for a turnover-based Investment Promotion Subsidy of 1.85% for 7 years, up to 30% of value of fixed assets created by the unit. With a rich talent pool, the state offers the chance to augment research, design and development capacities

Even in the start-up sector in the aviation and aerospace industry, Karnataka has been ahead of other states. What are the key elements that attract Young Minds to work for the state and country in Karnataka?

Karnataka is the 4th largest technology cluster in the world in Bengaluru. Bengaluru continues to be an attractive destination for talent with around 80% of Fortune 500 companies having their Global Innovation Centres here. Karnataka is a global startup hub having 3rd highest number of startups globally. 37% of the startup funding raised in India is from Bengaluru. Karnataka is the highest in India in terms of funding, deal counts, VC & PE activity. Furthermore, Bengaluru also houses 40+ out of 105 unicorns and 3 out of the 4 decacorns in India. This robust ecosystem is supported by a thriving social infrastructure. Karnataka recognises the importance and the role of new-age tech in building a better and futuristic tomorrow.

As far as the aviation and aerospace sector is concerned, you have set ambitious goals to attract around Rs.50000 crores of investment in the next 5 years. Could you explain the same on how it will help in making the state an aviation hub?

Karnataka is already an aviation hub. The proposed investment target will help solidify its position further. For the same, we are considering the sector as special category and offering 5% additional subsidy to the sector.



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BEL wins ICC PSE Excellence Awards



Vikraman N, Executive Director (Radar) & Unit Head, BEL-Ghaziabad, and Rashmi Kathuria, GM (SCCS), BEL-Ghaziabad, receiving the ICC (Indian Chamber of Commerce) PSE Excellence Awards from Madhukar Gupta, Commissioner, State Election Commission, Rajasthan.

Navratna Defence PSU Bharat Electronics Limited (BEL) has won three ICC (Indian Chamber of Commerce) PSE Excellence Awards for the "Company of the Year", "Inclusivity - Contribution of Women and Differently

Abled in PSEs", as well as Runner Up Award for "Operational Performance Excellence". Vikraman N, Executive Director (Radar) & Unit Head, BEL-Ghaziabad, and Rashmi Kathuria, GM (SCCS), BEL-Ghaziabad, received the awards on behalf of BEL from

Madhukar Gupta, Commissioner, State Election Commission, Rajasthan, at the 12th PSE Conclave & Excellence Awards, organised in New Delhi.

EMBRAER: Power & Glory



Known worldwide for the engineering excellence, technology mastery, and industrial capabilities that consistently result in aircraft, systems and solutions that achieve or surpass the levels of performance, reliability, maintainability, and longevity, Embraer Defense & Security offers to the market unbeatable cost-effective solutions complemented by a global network of services and support. Caetano Spuldaro Neto, Vice President, Sales & Business Development, Middle East & Asia, Embraer Defense & Security, speaks to us about connecting further with the Indian Defence industry and deepening their presence in the local ecosystem.

Caetano Spuldaro Neto

*Vice President, Sales & Business Development
Middle East & Asia, Embraer Defense & Security*

The military aviation sector in India is recording a steady growth over the last few years and there is huge potential for aerospace manufacturers. How important is the Indian market for Embraer?

As fellow BRICS members, there are strong ties that bind India and Brazil. India is a key market for us, and Embraer has much to offer in the diverse fields of Defence & Aerospace, Civil Aviation and Business Aviation as well as Space.

There is a sizeable fleet of Embraer's defence aircraft, commercial aviation aircraft, and business jets operating in India and we look forward to growing our presence in the local ecosystem. We look forward to being at Aero India 2023 and connecting further with the Indian Defence industry and deepening our presence in the local ecosystem.

Could you share with us more on your association with Indian defence forces? What are the Embraer products in use in India?

In India, Embraer supplied its ERJ 145 platforms for the Indian Air Force's AWACS project (NETRA Airborne Early Warning & Control System). NETRA continues to be successfully operated by the Indian Air Force (IAF) and have been deployed for key missions. Embraer Legacy 600 jets are also operated by the IAF and Border Security



Force for the transportation of government officials and VIPs.

There were reports that Embraer has been offering the C-390 Millennium to reinforce the medium/heavy transport capability of the Indian Air Force (IAF). What are the highlight features of the aircraft?

The C-390 Millennium is the most modern next-gen military tactical transport aircraft, and its multi-mission platform offers an unbeatable combination of low operating costs and fast turnaround. The C-390 Millennium is a twin-engine aircraft powered by IAE V2500 engines and it carries more cargo (26 tonnes) compared to other medium sized military cargo aircraft and flies faster (470kts) and further on a standard crew duty day.

The C-390 can carry out a wide range of missions using the same platform, from air-to-air/ in-flight refuelling (AAR) for fixed and rotary wing aircraft (denominate KC-

390 for this configuration), humanitarian missions, medical evacuation, firefighting, airborne troop and cargo transport, search and rescue, among others, with simple and rapid reconfiguration between the different configurations using conversion kits. The aircraft was designed to operate on semi-prepared or damaged runways as well as in hostile environments, ranging from hot and humid to cold dry conditions. The C-390 is certified to operate from airfields having an altitude of up to 14,000 ft which can support IAF's operations from India's Northern sectors.

The C-390 Millennium is a proven aircraft and has already accrued more than 7,500 flying hours to date in very short time after its 2019 entry into service with the Brazilian Air Force (FAB). Five KC-390s are being operated by the FAB and more deliveries are underway. Recent numbers from the Brazilian Air Force's KC-390 Millennium fleet have shown a mission completion rate of 99%, demonstrating outstanding productivity in its category. The C-390 has orders from Portugal and Hungary, two NATO member countries. The Netherlands, also a NATO country, has selected the C-390 Millennium in 2022 over other competitors after a detailed comparative analysis and research.

The aircraft is also gathering a lot of interest from other parts of the world including Asia. Embraer's C-390 offers a versatile force-multiplier, and we are confident of the benefits the KC-390 Millennium will bring to the Indian Air Force.

What are the latest updates of the company's business in defence sector?

Known worldwide for the engineering excellence, technology mastery, and



industrial capabilities that consistently result in aircraft, systems and solutions that achieve or surpass the levels of performance, reliability, maintainability, and longevity, Embraer Defense & Security has products and solutions operating in more than 60 countries. Embraer offers to the market unbeatable cost-effective solutions complemented by a global network of services and support. We are, more than ever, committed to providing our customers the best of solutions that are customised to their needs.

In recent years, Embraer Defense & Security has grown its portfolio as we recognise that the nature of customers' needs is ever-changing and growing. Our solutions have expanded to the air, land, maritime, space and cyber segments. Embraer offers integrated solutions for Intelligence, Surveillance, Reconnaissance and Monitoring, embedded systems, remote sensing solutions, and other

critical defence technologies.

We seek to widen our global footprint by introducing our products to new customers, as well as strengthening our existing relationships with current operators of our platforms. We are also keen to see our flagship C-390 Millennium join the fleet of more air forces around the world. We can't wait for it to fly across India's skies!

India is actively supporting indigenisation in aerospace sector and Embraer recently said talks for manufacturing aircraft in India were progressing well. What is your take on this?

Embraer clearly understands that indigenisation has always been a key element of India's defence policy – focusing on "Make in India" and Atmanirbhar Bharat (Self-Reliant India). Embraer can help India to become a critical supplier in the global supply chain through its substantial offerings in units such as Defence, Commercial Aviation, Aerospace, enabling it to attain a higher level of self-reliance and achieve global exporter status.

We see India not as a customer but as a promising business partner. Embraer has been working very closely with partners and customers in the Indian Defence market for a long time – from the entry of the Legacy 600 with the government to the Indian Air Force's AWACS project. Through this experience, we understand the Indian defence market's objectives and vision.

We are always keen to build Embraer's presence to establish win-win partnerships to boost India's defence indigenisation ambitions.



RAFAEL: Novel Solutions to Future Challenges



RAFAEL is making strides in the sphere of new space and satellite technologies, from micro/nano satellites amongst many space-based solutions for effectively dealing with contemporary defence and intelligence challenges, says Brig Gen. (Retd) Ariel Karo, Executive Vice President, Marketing and Business Development, Rafael Advanced Defense Systems Ltd, while highlighting their I-Derby Missiles, the SPYDER Air Defence System, the RecceLite Reconnaissance Pod, the SPIKE Missile Family, the SPICE Family of Air-to-Surface Missiles, the BNET Tactical Communications system, and advanced versions of both Litening and RecceLite pods.

Brig Gen. (Retd) Ariel Karo

*Executive Vice President, Marketing and Business Development
Rafael Advanced Defense Systems Ltd*

Defence ties have been a mainstay in the bilateral relationship between India and Israel. How does Rafael contribute to this?

RAFAEL leads the way for years in cooperation and partnerships in India, whether through the creation of daughter companies or through cooperation agreements with large numbers of private and public companies located in India.

RAFAEL has been active for years in India as part of a long-term effort to invest in the supply of advanced defense systems while abiding by acquisition regulations. We at RAFAEL are convinced that our wide efforts with local companies create many new opportunities for both local industry and customers while maintaining a principle of self-reliance.

What are the latest highlights of Rafael's association with the Indian Armed Forces and companies?

We are unable to disclose information regarding specific systems in use. That said, RAFAEL has a wide range of cutting-edge systems in use in India Armed Forces in all three military branches for over 30 years.

South Korea's military is now considering the purchase of Sky Spotter Israeli system that detects unmanned aerial vehicles

(UAVs).

Could you share more details? How do you look at Asian market for your products?

SKY SPOTTER is a passive electro-optical early warning system with a high probability of detection and a very low false alarm rate, enhancing the capability of air defence radar detection systems. SKY SPOTTER provides supplementary aerial operational awareness and neutralizes legacy radar threats.

This system provides passive sensing, detection, tracking, and identification of aerial targets. SKY SPOTTER remains unaffected by classic radar challenges

such as multipath, clutter, background, EW & CM, and low RCS-stealthy targets. Likewise, the system tracks multiple targets simultaneously, providing 24/7 persistent surveillance. This is done by corroborating multiple sensors to achieve highly accurate azimuth, elevation, and range.

Rafael upgraded the Spyder system to counter tactical ballistic missiles. Could you elaborate on the system and its recent upgrade?

The introduction of this feature is the product of RAFAEL's Counter-TBM SPYDER program which involved researching and



analysing the lessons learned from recent and ongoing armed conflicts involving extensive use of tactical ballistic missiles. The program has brought about a practical upgrade to the SPYDER system which is equipped for implementation. In response to urgent operational requests from a number of existing customers throughout the world, the program will extend the capabilities of the SPYDER's effectors as well as the implementation of various Counter-TBM derivatives across the system.

The SPYDER Air Defence System is the only Israeli-made air defence system that has been incorporated into the aerial defence array of NATO. SPYDER is a quick reaction, low-level surface-to-air missile system designed to counter attacks by aircraft, helicopters, UAVs, and precision-guided munitions. The system provides effective protection of valuable assets and first-class defence for forces located in the combat area. SPYDER's open architecture allows external components to be easily integrated and flexibly combined, affording different configurations with various ranges and capabilities based on customer needs and priorities. Its autonomous capabilities can detect threats while on the move and enables a 360° launch within seconds of the target being declared hostile, in all-weather, multi-launch, and net-centric capabilities. All the SPYDER systems have multiple target engagement capabilities for handling saturation attacks.

SPYDER systems incorporate the most advanced air-to-air-missiles with proven performance: Rafael's PYTHON-5 dual waveband IIR missile, I-DERBY active radar BVR, and the I-DERBY ER long-range missile, each of which can be used for air-to-air missions. The SPYDER-SR and SPYDER-ER variants provide 360° slant launching missile



systems that provide quick reaction, lock-on-before-launch (LOBL), and lock-on-after launch (LOAL) capabilities while extending the range of defence to up to a 40 km radius. The SPYDER-MR and SPYDER-LR offer medium and long-range target interception through vertical launch while pushing the defence envelope up to an 80 km radius. The most recent variant, SPYDER All-in-One, incorporates an integrated radar, Toplite EO/IR sensor, and launcher onto a single platform to address a defence force's individualized, operational needs.

How successful has been KRAS, Rafael's JV with Kalyani Group, in achieving its missions? What are the latest updates on KRAS' operations?

RAFAEL is active in tens of countries, producing and exporting advanced systems and capabilities to various customers worldwide. We at RAFAEL believe that our work in the local market, through our partnerships and daughter companies, will bring additional opportunities for significant exports in the near future.

Geospatial Imagery Systems market is set to witness huge growth in the next decade. Being a top player in the sector, could you talk about your operations and products? What are the plans to tap the potential?

RAFAEL is making strides in the sphere of new space and satellite technologies, in our portfolio there are a few examples of this, from our micro/nano satellites amongst others. For example, RAFAEL's LiteSat which provided 24/7 tactical ISR from space. This is just one of RAFAEL's many space-based solutions for effectively dealing with contemporary defence and intelligence challenges. LiteSat delivers near real-time results with an outstanding imaging resolution of 30 cm. We at RAFAEL continue to push the envelope, creating novel solutions to future challenges.

Recent trials proved that Rafael's footprint system's navigation capabilities for GPS-denied environments. Could you talk more about the system?

FOOTPRINT is a navigation system designed for dismounted soldiers that enables highly accurate, fully reliable, and continuous real-time, self-positioning information in GPS-denied environments. The system can be integrated together with any existing communication system and includes an extremely efficient SWAP (Size Weight and Power) form factor that includes multiple types of measurement units which all feed data into the system algorithms. FOOTPRINT utilizes RAFAEL's algorithms and data fusion from multiple sensors, to provide an accurate 3D location for the soldier which allows for optimal situational awareness and orientation even in the most complex settings.



PBS Aims at Deeper Roots in Indian Aerospace Industry



PBS India has already achieved significant success in its efforts to become a respected partner to key companies in the Indian defence and aerospace industries. PBS recognises the growing role of India in the worldwide economy, and intends to strengthen its presence in India by expanding the business. Speaking to Aeromag, Ravi Hazarika, Chief Commercial Officer, PBS India, talks about the company's operations, highlights of its participation at Aero India and the future plans.

Ravi Hazarika, PBS INDIA Sales Director with **Petr Motyl Hazarika**, PBS INDIA Director.

What would you say is the biggest achievement of PBS India so far?

The PBS Brand has a quite long history in India, it was registered in 1955. But it is only in recent years that business activity has really picked up thanks to the Indian company PBS India and important successes have been achieved. The business is steady growing and new partnerships are formed. PBS India is now an established company in the Indian aerospace and defence market. We work with many Indian defence companies and agencies, for example with DRDO, HAL, Deep Engineering, JSR Dynamics, and L&T Defence.

We regularly participate in major aerospace and defence exhibitions. Last year, it was DefExpo in Gandhinagar, this year is PBS India preparing to showcase its capabilities at Aero India that will be held in Bengaluru. And of course, PBS India, together with our partners at Deep Engineering Industries, is actively offering replacements of old APUs used in Mi-17 helicopters for technologically superior PBS APUs and providing MRO for Mi-17V5. PBS India aims to improve the combat readiness and service life of the MIL Mi-17 fleet operated by the Indian Air Force by supplying our APUs which proved to be more reliable in harsh weather conditions and provide a much better operating envelope.

What's new in APUs?

We would like to showcase our ability to offer our partners a mutually interoperable APU and ECS, especially for medium helicopters. However, we are also able to offer these technologies, for example, to



PBS TJ150



PBS TJ 200 turbojet

manufacturers of heavy UAVs. There are many PBS products well-suited for Indian aircraft, helicopter and UAV programmes. If we look at some individual HAL products, for example the HJT-36 jet trainer, it is quite similar to the successful Aero Vodochody L-39, for which PBS Group has designed and supplied a turbine starter, environmental control system, and various valves and filters. Our advantage is that we can rely



on the development base of our parent company PBS, which has been a leading manufacturer of products and equipment for the international aerospace industry for almost 50 years. The ability to carry out in-house development, manufacture and testing of aircraft products in accordance with global aerospace standards is well known.

PBS India has the ability to design, construct, manufacture and test entire products – how can this cater to the government's efforts towards greater defence indigenisation?

It is simple, PBS India shares the know-how and capacities of the whole PBS Group, which boasts a 200 years history and 50-year experience in design, manufacturing, and testing aircraft turbine

systems. Therefore, any requirements of the Indian Government or the Indian MoD would be backed up by the whole group. This would inevitably result in independence on foreign companies and an increase in speed when it comes to the development of crucial systems for various types of civil or military aircraft, which I believe would prove quite beneficial. We are ready and willing to support the Indian aerospace industry.

What do you see for the future of PBS India?

PBS recognises the growing role of India in the worldwide economy, as well as the fact that it will very soon become the most populated country on our planet. So PBS India definitely intends to strengthen its presence and plans to expand the business in the country. We would like to build a bigger presence in our "Indian home town" Bengaluru and grow our business in India. That will create more jobs and increase our sourcing demands for locally produced materials, services and work force as more production, service, and after-sales support capacities will be allocated in India. And of course, we are interested in working with young talent from this beautiful country. PBS India is growing and we are happy to be a reliable partner for Indian defence industry.



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DEFEA 2023: High level meeting held with National Defence Minister

A working meeting led by the Greece Deputy Minister of National Defence Nikolaos Hardalias with executives of the exhibition organization company ROTA SA took place at the Ministry of National Defence on the subject of the International Defence and Security Exhibition "DEFEA 2023 - Defence Exhibition Athens", which will take place from 9 to 11 May 2023, in Athens.

The meeting was attended by the ROTA SA, Chairman of the Board Georgios Tsausoglou, the CEO Alexis Lagoudakis and the Director of the "DEFEA 2023" Exhibition Vassilios Barkas. The Directors of the Executive Office Eleni Bobou and of the Military Office Captain Georgios Zouros HN, as well as competent Staff of the Office of the Deputy Minister of National Defence.

Organizational actions and action planning were discussed regarding the holding of



the second DEFEA, in which, currently, 350 leading defence companies from 27 countries have registered to participate, either with national stands or as independent entries.

The first DEFEA in 2021 was successful, with the participation of 315 exhibitors from 22 countries and the presence of 45 official national delegations. This year the expectations are even higher. With the cooperation of the Association of Hellenic Manufacturers of Defence Material (SEKPY),

which represents over 150 certified Greek companies active in the field of Defence, and the valuable patronage and assistance of the Ministry of Defence, DEFEA will once again present an exhibition worthy of the history of defence exhibitions of the country and the importance of its geopolitical position.

As part of the work of the Exhibition, which aims to be the point of reference for the region of South-Eastern Europe and the Eastern Mediterranean, events and workshops will be organized in the field of the defence industry, initially highlighting the Greek defence industry but also European and NATO initiatives, such as the European Defence Fund (EDF Cross Project Conference) and NATO defence innovation initiatives, such as the Defence Innovation Accelerator for the North Atlantic (DIANA) and the NATO Innovation Fund.

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India to Mark its Resolute Presence in International Shows



The pandemic era has almost come to an end and the global aerospace and defence industry is fully recovering from its impact. Defence and aero shows are being conducted full-fledged after nearly three years and the events mark huge participation from all countries. In February, India conducted its premier air show-cum- exhibition Aero India revitalising the industry by forging new partnerships. However, it is inevitable for India to make its astonishingly resolute presence in all major exhibitions not only in India but around the world. The Defence Exhibition Organisation (DEO), under the aegis of the Department of Defence Production, Ministry of Defence, the DEO is responsible for organising the Aero India, Def Expo and the India Pavilions in various International Defence Exhibitions and Airshows. Led by its Director, Achal Malhotra, DEO is steadfast to ensure a strong participation of India in all international events.

Achal Malhotra
Director, DEO

The Ministry of Defence has successfully conducted the Asia's largest aero show -- Aero India 2023. Prime Minister Narendra Modi inaugurated the 14th edition of the premier biennial airshow in Bengaluru, Karnataka on February 13, 2023. Spanning over five days, the event, themed 'The runway to a billion opportunities', radiated the rise of a strong and self-reliant 'New India' by displaying India's growth in aerospace and defence capabilities. The focus was on showcasing indigenous equipment/ technologies and forging partnerships with foreign companies, in line with 'Make in India, Make for the World' vision for a secure and prosperous future.

Aero India 2023 was a shining example of India's growing capabilities and the presence of around 100 nations at this event showed the trust that the entire world shows in India. Modi noted the participation of more than 800 exhibitors including Indian MSMEs and startups along with the well-renowned companies of the world. A nation which used to be the largest defence exporter for decades has now started exporting defence equipment to 75 countries in the world and Aero India testified it.

Modi said that India aims to take rapid



Mr. T.Natarajan, Additional Secretary ,Department of Defence Production, Ministry of Defence, Govt.of India and the Indian delegation visiting the EDGE Pavilion during NAVDEX and IDEX exhibition at Abu Dhabi. Mr.Theunis Botha, CEO, Al Tariq ,an EDGE group company, Mr. Achal Malhotra, Director, Defence Exhibition Organisation, Ministry of Defence, Govt.of India, Senior Officers of Defence PSUs are also seen.

strides to be included among the largest defence manufacturing countries and the nation's private sector and investors will play a big role in that. Noting the revolution brought in every sector with the help of reforms, the Prime Minister said that the new India of the 21st century will neither miss any opportunity nor will it lack any effort.

At a time, when the global aerospace and defence industry is fully recovering from the impact caused by the pandemic, it is inevitable for India to make its astonishingly resolute

presence in all major exhibitions not only in India but around the world. Rajnath Singh, Minister of Defence, has rightly said that India today offers a unique opportunity in defence and aerospace manufacturing. This opportunity comes as a "Sangam (confluence)" of rising demand, greater innovation, conducive policies and maturing ecosystem in defence and aerospace manufacturing sector. To further this growth and conducive ecosystem, participating in international event has primordial importance.

BEL pays Rs. 224 Crore as Interim Dividend



Bhanu Prakash Srivastava, Chairman & Managing Director, BEL, presenting the second Interim Dividend cheque to the Defence Minister, Rajnath Singh, and Giridhar Aramane, Secretary (DP), in the presence of Shalabh Tyagi, Joint Secretary (P&C), T Natarajan, ASDP, Damodar Bhattad, Director (Finance) & CFO, BEL, Manoj Kumar, ED (National Marketing), BEL, and G S Arora, AGM (Fin-OU)/RO-Delhi, BEL.

Bharat Electronics Ltd (BEL), a Navratna Defence PSU, has paid Interim Dividend of 60% on its paid-up capital to the Government of India for the financial year 2022-23.

Bhanu Prakash Srivastava, Chairman & Managing Director, BEL, presented the second Interim Dividend cheque of Rs.

224,27,53,160.40/- payable on the shares held by the President of India, to the Defence Minister, Rajnath Singh, in New Delhi. BEL has declared 60% percent as Second Interim Dividend (Rs. 0.60/- per share) to its shareholders for the financial year 2022-23.

This is the 20th consecutive year that BEL

is paying Interim Dividend. BEL has paid 60% per cent as First Interim Dividend (Rs. 0.60/- per share) in February 2023 to its shareholders for the financial year 2022-23. BEL has paid a total dividend of 450% on its paid up capital for the financial year 2021-22.

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Realising that, Defence Exhibition Organisation (DEO), under the aegis of the Department of Defence Production, Ministry of Defence, stands steadfast to make it happen in a seamless manner. Led by Achal Malhotra, Director, DEO is responsible for organising the Aero India, Def Expo and the India Pavilions in various International Defence Exhibitions and Airshows.

The Defence Exhibition Organisation (DEO) has been established in 1981 with the main charter to organise and coordinate aerospace and defence exhibitions in India and abroad. DEO, through the aerospace and defence exhibitions in India and abroad promotes export potential of indigenous aerospace and defence sector.

The DEO has been playing a major role in the success of Aero India the biennial International show on Aerospace, Defence and Civil aviation ever since it was launched in 1996. The 14th edition of Aero India

forged partnerships between foreign and Indian firms and Indian and Indian firms translating to discovery of newer avenues in the global value chain through fast-tracking the indigenisation process.

DEO has also played a stellar role in the successful conduct of DefExpo, India's flagship biennial event showcase Land, Naval and Homeland Security System since its inception in 1999. The 12th edition of DefExpo-2022 was organized from 18th to 22nd October 2022 at Gandhinagar, Gujarat. The exhibition have showcased India's emergence in the shape of alliances and joint ventures for the defence industry. The theme of the DefExpo-22 was 'Path to Pride' and was in semblance with the Prime Minister's vision to transform India into a strong nation by enhancing patriotic and civil consciousness of our citizens as also for making India Atmanirbhar in defence by supporting, showcasing and forging partnerships for the Indian aerospace and defence manufacturing

sector with both Indian and Global customers.

DEO is also entrusted with ensuring India's majestic presence in international exhibition abroad. With a view to provide visibility and an impetus to export potential of the Indian Aerospace & Defence Industry, DEO coordinates the setting-up of 'India Pavilion' at major international aerospace and defence exhibitions abroad.

India pavilion is an opportunity to develop market for defence products being manufactured by Indian industry. DEO aims to maximise the public and private sector participation at the Global Aerospace and Defence exhibitions with the aim to showcase the indigenous capabilities and expanse of the Indian opportunity. In the year 2023, the Defence Minister has approved participation in 10 foreign exhibitions, where India Pavilion is to be set-up and the DEO is putting in all efforts to make them happen.

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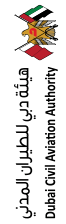
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IAI has successfully concluded the first flight of B777-300ER passenger aircraft to cargo configuration



IAI is a global leader in passenger-to-cargo aircraft conversions, and is currently in the final stages of the certification process for “The Big Twin” 777-300ERSF with a firm backlog of over 60 aircraft expected to deliver over the next five years

Israel Aerospace Industries (IAI) announced the successful completion of the first test flight, as part of the final certification process for the B777-300ER passenger aircraft converted to a cargo configuration, known as, The Big Twin. On conclusion of the certification process by the Civil Aviation Authorities, The Big Twin will be the first twin engine aircraft of this type, able to carry 100 tons’ cargo payload. This program adds to IAI’s 45-year aircraft conversion track record including the B767-200/300, B747-400, and B737-700/800 freighter programs, in service today.

In response to the strong demand for

cargo aircraft, IAI is currently establishing a number of remote conversion facilities around the world, in addition to the facilities at IAI’s home company. During the last year, IAI’s Aviation Group has signed hundreds of millions of dollars of passenger-to-cargo conversion contracts with the world’s leading aviation companies including AerCap, Emirates Cargo, Challenge Group, EVA Air and CargoJet.

Shmuel Kuzi, EVP and General Manager of IAI’s Aviation Group said: “The successful first flight conducted today is a world breakthrough in the field of widebody aircraft passenger-to-cargo conversions. The advanced capabilities and efficient solutions which IAI offers its customers provide the solution having the best value available in the market, supporting the growing demand for cargo aircraft around the world.”

Richard Greener, the Head of Cargo,

AerCap, said, “IAI’s Aviation Group has achieved a significant milestone today. We would like to thank all of IAI’s employees who made this inaugural flight happen. AerCap firmly believes that this conversion program is the most comprehensive and well-designed widebody freighter to meet the future requirements for the global air cargo market.”

IAI’s Aviation Group is the world’s leading conversion facility for many aircraft types. The Group deals with all types of manned aircraft, both military and civilian, in IAI; passenger-to-cargo conversion; maintenance, repair and operations (MRO); business jets; aerostructures and assemblies; aircraft upgrades, and more. Among IAI’s customers are the world’s leading logistics and delivery companies including Amazon, FedEx, and DHL.



GRSE launches INS Androth, 2nd in a series of 8 ASW SWCs

As she felt water under her keel for the first time on March 21, 2023, at Garden Reach Shipbuilders and Engineers (GRSE) Ltd, INS Androth, as this warship was named in a solemn ceremony – the second in a series of eight Anti-Submarine Warfare Shallow Water Craft (ASW SWC) being built by GRSE Ltd for the Indian Navy - highlighted the strategic importance of the chain of 36 islands in the Arabian Sea that are part of Indian territory.

Vice Admiral Dinesh K Tripathi, Flag Officer Commanding-in-Chief, Western Naval Command was Chief Guest at the occasion and the ASW Shallow Water ship, INS Androth was christened and launched by Shashi Tripathi, President, NWWA, Western Region. Former Indian cricketer Arun Lal was Guest of Honour during the ceremony.

Cmde PR Hari IN (Retd), Chairman and Managing Director, GRSE, Vice Admiral Kiran Deshmukh, CWP&A Indian Navy, Shri RK Dash, Director (Finance), GRSE, Cdr S Bose, Director (Shipbuilding), GRSE, Shri Mihir Kumbhakar, CVO, GRSE & other Senior officials of Indian Armed Forces & GRSE were present on the occasion.

The primary role of these 77 metres long, waterjet propelled ASW Shallow water crafts capable of maximum 25 knots speed is to conduct anti-submarine operations in coastal waters, Low Intensity Maritime Operations (LIMO) and mine laying operations. These ships are also capable of full-scale sub surface surveillance of coastal waters and various surface platforms and coordinated ASW operations with aircraft.

These ships may be smaller in size but will pack a lethal punch. They will carry lightweight torpedoes, ASW rockets and mines, close-in weapon system (30 mm gun) and 16.7 mm stabilized remote-controlled guns. The ASW SWC will also be fitted with hull mounted sonar and a low frequency variable depth sonar. All the ships of the Project are being built to IR Class rules for Naval Vessels. The Class Surveyors have been instrumental in ensuring construction as per Class rules.

Vice Admiral Tripathi stated, "The construction of specialized ships such as these for Anti-Submarine Warfare is indeed in sync with the provisioning of a combat ready credible cohesive & future proof



force, which is ready to face the existing and future challenges in the maritime domain. I am happy to inform you, the ship to be launched today has made quick progress during construction notwithstanding the vicissitudes of shipbuilding as we all know. I take this opportunity to congratulate the GRSE for being the only DPSU shipyard for receiving the Raksha Mantri Award 2022, for designing the ASW Shallow Water Craft."

Cmde P R Hari IN (Retd), CMD, GRSE Ltd, highlighted the long and fruitful relations that the shipyard has had with the Indian Navy. "Garden Reach Shipbuilders and the Indian Navy go back a long way and 63 years of our coexistence has seen tremendous growth of both the organisations. We at GRSE, are indeed proud to have partnered the Navy in a quest of attaining Blue Water capability and also, in its transition from a

Buyers Navy to a Builders Navy. 70 Warships were delivered to Indian Navy and 15 more under various stage of construction in this, the sheer numbers reflect the strength of this partnership and these platforms range from Boats to Fast Attack Crafts, to Survey Vessels, to Landing Crafts to Corvettes, to Frigates, and now Anti-Submarine Shallow Water Crafts, and Advanced Frigates. GRSE is a diversified company and our USP is our product profile. From Warships to Commercial Ships to Diesel Engines, to Deck Machinery, to Portable Steel Bridges, the company is doing well, both in terms of physical and financial performance. The first ship of this ASW Shallow Water Craft project was launched on 20th December 22 and within 3 months of launching the first ship, here we are today to launch the 2nd ship," he said. ■

India Committed to Harness Energy and Capability of Private Sector Partners: Defence Minister



Indian Defence Minister Rajnath Singh has called upon Indian and global industry leaders to support the Government's endeavour to design, develop and manufacture cutting-edge products, using critical technologies within the country to attain complete 'Aatmanirbharta' in defence, with the overall objective of achieving shared global peace and prosperity. He was addressing CEOs of local and global Original Equipment Manufacturers (OEMs) during a

Round Table organised as part of Aero India 2023 in Bengaluru.

The Minister asserted that India does not want to remain just an assembly workshop and is looking to engage with friendly countries in defence and security based on sharing expertise and capabilities under the 'Make in India, Make for the World' vision of Prime Minister Narendra Modi. He assured industry leaders that the government is open to new ideas and is committed to fully

harness the energy, entrepreneurial spirit and capability of private sector partners in the area of defence production..

The Government is resolved to nurture a vibrant and world-class defence manufacturing industry, the key driver of Indian economy. A number of far-reaching reforms have been undertaken by Ministry of Defence to create a business-friendly climate in the country. These include setting up of defence corridors in Uttar





Pradesh and Tamil Nadu; simplification of industrial licensing processes; hike in cap on FDI in defence; opening of government trial and testing facilities for the private sector; increase in capital outlay for defence in Budget 2023-24 and launch of Technology Development Fund and Innovations for Defence Excellence. These reforms will enable Indian defence products to compete with established global defence and aerospace companies.

Indigenisation is the mantra for India today, unlike in the past when import was the default option. There is growing enthusiasm and greater participation of private players in defence production. The partnership between Government and the Industry is based on equality and mutual trust, said Rajnath Singh.

The CEOs Round Table was organised on the theme 'Sky is not the limit: opportunities beyond boundaries'. The participating companies included Boeing, Lockheed Martin, Israel Aerospace Industries, General Atomics, Liebherr Group, Raytheon Technologies, Safran, General Authority of

Military Industries, Hindustan Aeronautics Limited, Bharat Electronics Limited, Bharat Dynamics Limited, BEML Limited, Mishra Dhatu Nigam Limited, Larsen & Toubro, Bharat Forge, Dynamatic Technologies and BrahMos Aerospace.

This platform was to forge partnerships between domestic and global Industries of the aerospace and defence sector to address the present and future global needs and discuss the importance of supply chain strategy and operations as the world deals with the aftermath of the pandemic and global disruptions. More than 75 companies, including 28 foreign OEMs from 15 countries and domestic companies and DPSUs participated in the discussion. There was official participation from Sudan and Saudi Arabia. The significance of roundtable discussion as "dialogue between equals" was emphasised.

Many foreign OEMs made announcements regarding their plans for investments and collaborations including Safran, Boeing, Collins Aerospace, Pratt & Whitney and Thales in defence and aerospace sector.

General Atomics and Bharat Forge announced to deepen their collaboration in aircraft components and parts. Hensoldt announced Design/TOT and IPR transfer of obstacle avoidance system for Indian Helicopters and co development of Advanced Multi Sensor Electro-optics Airborne Gimbals for Indian and world market. CEOs of domestic companies including Bharat Forge, L&T and Mahindra Defence Systems shared their views on major reforms and their impetus for robust defence system under Aatmanirbhar Bharat.

The CEO Roundtable engaged industries for co-development and co-production to make India a Commercial Manufacturing Hub and base for global product support, while exploring Indian and Global market.

Chief of Defence Staff General Anil Chauhan, Chief of the Air Staff Air Chief Marshal VR Chaudhari, Chief of the Naval Staff Admiral R Hari Kumar, Chief of the Army Staff General Manoj Pande and Defence Secretary Giridhar Aramane also attended the Round Table.

Aero India a Testimony to ‘New India’



India is taking rapid strides to be included among the largest defence manufacturing countries and our private sector and investors are playing a big role in it, said Prime Minister Narendra Modi. He was inaugurating the 14th edition of Aero India 2023, Asia's biggest aero show, at Air Force Station, Yelahanka in Bengaluru on February 13, 2023.

With its message of Reform, Perform and Transform, India is touching new heights and

transcending them too. The nation which used to be the largest defence importer for decades has now started exporting defence equipment to 75 countries in the world. Our aim is to take defence exports from 1.5 billion to 5 billion by 2024-25, said the Prime Minister.

The Prime Minister said that Aero India 2023 is a shining example of India's growing capabilities and the presence of around 100 nations at this event shows the trust that

the entire world shows in India. More than 800 exhibitors including Indian MSMEs and startups along with the well-renowned companies of the world are participating in the five-day event. India's growth in aerospace and defence capabilities are showcased here, displaying indigenous equipment/technologies and forge partnerships with foreign companies, in line with 'Make in India, Make for the World' vision for a secure and prosperous future.





Aero India is taking place in Karnataka which is the hub of India's technological advancement. This will open new avenues for the youth of Karnataka in the aviation sector. The Prime Minister called upon the youth of Karnataka to deploy their technological expertise in the field of defence to strengthen the country.

The Prime Minister said that India's successes are bearing witness to its capabilities. Tejas, INS Vikrant, advanced

manufacturing facilities in Surat and Tumkur are the potential of Aatmanirbhar Bharat with which the world's new alternatives and opportunities are linked.

"The new India of the 21st century will neither miss any opportunity nor will it lack any effort," the Prime Minister said as he noted the revolution brought in every sector with the help of reforms.

The Prime Minister said the entire world is taking note of the reforms made for 'Ease

of Doing Business' in India and touched upon the various steps taken to create an environment that favours global investments as well as Indian innovation. The Prime Minister released a Commemorative Stamp on the occasion.

Defence Minister Rajnath Singh lauded Prime Minister Narendra Modi for guiding India on the political and economic map of the world and made special mention of his unwavering commitment towards the industrial and economic growth of the country. Rajnath Singh asserted that India has become a promising manufacturing destination due to its business-friendly environment and cost-competitiveness. "India has become the fifth largest economy in the world due to the vision and determination of our Prime Minister. It is well on course to become the third largest economy in the next 4-5 years. India's G-20 presidency this year is also a reflection of India's growing stature on the international platforms," he said.

Governor of Karnataka Thawar Chand Gehlot, Chief Minister of Karnataka Basvaraj Bommai, Union Minister for Civil Aviation Jyotiraditya Scindia and Raksha Rajya Mantri Ajay Bhatt were among those present on the occasion.



Indian Investors Pledge over Rs 200 Cr. through iDEX Investor Hub



Defence Minister Rajnath Singh launched the Ninth edition of Defence India Startup Challenges (DISC 9) on 'Cybersecurity' with 28 problem statements, and the iDEX Investor Hub (iIH). More than Rs 200 crores was pledged under iIH by leading Indian investors.

Rajnath Singh said the Innovations for Defence Excellence (iDEX) initiative, launched under the Defence Innovation Organisation (DIO) under the Ministry of Defence, has enabled talent from across the country to come forward. Services, DPSUs, Coast Guard as well as organisations under the Home Ministry are giving problem statements to our youth, who are rising to the challenge every time. India is supporting its youth to innovate, thereby empowering them to become job creators and manufacture indigenous defence products and reduce our dependence on imports.

In recognition of its impact, the platform was given the PM Award in the Innovation category. The Ministry of Defence has established a simplified, fast track procedure for procurement from start-ups and MSMEs due to their employment generation potential.

Citing the example of UPI payments as an innovation developed by Indian youth and introduced to the world, Raksha Mantri said that even developed nations are studying this technology to learn. He called for introducing similar innovations in existing methods or developing new technologies to usher in the next Generation Industrial Revolution.

DISC 9 is the first collaboration of iDEX

with Indian Cyber Crime Coordination Centre (i4C) division of Ministry of Home Affairs. These challenges have been curated from Services, DPSUs, and Ministry of Home Affairs, revealing the deep impact and interest iDEX has generated amongst the Defence industry. The winners of DISC 6, first three editions of iDEX Prime, and Open Challenge 5 and 6 were also felicitated. Phase 1 winners of challenges under Mission DefSpace were announced and felicitated. Innovators showcased futuristic technology developments in the domains of Autonomous Systems, Advanced Sensors, Space Technology, and Industry 4.0 at a static exhibition of start-ups supported by iDEX-DIO.

The 'iDEX Investor Hub' aims to accelerate investment in the Defence sector and give investors a unified view of opportunities and innovations. Defence Innovation Organisation (DIO) also signed MoUs with leading investors at Manthan. An MoU was signed with Axis Bank. DIO has also signed MoUs with ISRO, IN-SPACe, and ISpA to further strengthen the Defence Space. Another MoU was signed with the Border Roads Organisation (BRO) to potentially launch start-up challenges in the future. The fourth edition of Innovate4Defence internship (i4D) was also launched, inviting applications from students all over India.

Raksha Mantri also released the Indian Army's compendium of 110 Problem Statements for indigenous defence research, design, development and manufacturing ecosystem. The Problem Statements highlight Indian Army's technological challenges and requirements in various domains

ranging from Armament, Surveillance & Fire Control Systems to niche domains such as Artificial Intelligence, Blockchain, Metaverse, Robotics, Quantum Technology, Cyber, Smartisation of Ammunition etc. Further, they also involve induction of new technologies, upgradation of existing systems and indigenisation of critical components. This Compendium would enable focused efforts towards modernising the Indian Army with indigenous solutions, thereby building a stronger and Atmanirbhar Bharat. Industry and Academia will be hand-held by Indian Army through various research and development routes including iDEX, Technology Development Fund (TDF) and Army Technology Board (ATB).

iDEX-DIO also signed its 200th contract with a winner of the Indian Navy Prime challenge launched under the SPRINT initiative.

266 Partnerships, Worth Rs 80,000 Crore Forged during Bandhan Ceremony of Aero India 2023 in Bengaluru

Defence Minister Rajnath Singh said the MoUs and ToTs completed during the Bandhan ceremony of the Aero India 2023 in Bengaluru will pave the way for enhanced FDI in defence and take the manufacturing in the sector to greater heights. He defined Bandhan as not just an agreement between two sides limited to economic benefit, but a new resolution to bolster the nation in the defence domain. The partnerships forged with friendly countries will take their bilateral collaboration with India to the next level.

The Bandhan ceremony witnessed the

Airshows and Defence Exhibitions



SL NO	Event	Date/Year	Country
1	LAAD Security 2023	11-14 April,2023	Rio De Janeiro, Brazil
2	IMDEX ASIA-2023	3-5 May,2023	Singapore
3	DEFEA-2023	9-11 May,2023	Athens, Greece
4	LIMA -2023	23-27 May,2023	Langkawi, Malaysia
5	Milipol Asia-Pacific 2023	18-20 May,2023	Singapore
6	Paris Airshow-2023	19-25 June ,2023	Paris, France
7	Army Expo-2023	14-20 Aug,2023	Moscow,Russia
8	DSEI-2023	12-15 Sep,2023	London,UK
9	Seoul ADEX-2023	17-22 Oct,2023	South Korea
10	Defence & Security-2023	6-9 Nov,2023	Bangkok, Thailand
11	INDO PACIFIC-2023	7-9 Nov,2023	Sydney, Australia
12	MILIPOL PARIS-2023	14-17 Nov,2023	Paris, France
13	EDEX-2023	4-7 Dec,2023	Cairo, Egypt
14	World Defence Show-2024	4-8 Feb,2024	Riyadh, Saudi Arabia
15	Singapore Air show-2024	20-25 Feb,2024	Singapore
16	DIMDEX-2024	5-7 Feb,2024	Doha, Qatar
17	MILIPOL INDIA 2023	26-28 October 2023	New Delhi
18	DSA Malaysia-2024	6-9 May ,2024	Kuala Lumpur, Malaysia
19	Eurosatory-2024	17-21 June, 2024	Paris, France
20	Asian Defence & Security (ADAS)-2024	25-27 Sept ,2024	Manila, Philippines





forging of 266 partnerships including 201 MoUs, 53 major announcements, nine product launches and three Transfers of Technology, worth around Rs 80,000 crore.

Major agreements

MoU between Hindustan Aeronautics Limited and Safran Helicopter Engines, France for Work Share for formation of Joint venture for Design, Development, Manufacture and life time support of Helicopter Engines.

MoU between Bharat Electronics Ltd and Aeronautical Development Agency on IWBC and Other LRUs for Advanced Medium Combat Aircraft (AMCA).

Co-operation between BSS Material Limited and Pegasus Engineering, an ADUSEA Inc. Division (USA) for Logistic Drones for the Indian Army towards Last Mile Delivery for forward troops deployed along the border areas with capability of operation in wind/gust condition, rain/Snow etc.

MoU between Gopalan Aerospace India Pvt. Ltd. and Ompol, Czech Republic for manufacturing and assembling of first passenger aircraft (L 410 UVP-E20 version) by a private company in India.

MoU on collaboration of Sagar Defence Engineering Private Limited (SDEPL) and Israel Aerospace Industries (IAI) for IDEX Challenge 'Autonomous Weaponized boat Swarm' for Indian Navy.

MoU between Bharat Dynamics Limited

and Bultexpro Ltd., Bulgaria for setting up the manufacturing facilities for 122mm GRAD BM ER and NONER rockets in India and fulfill the requirements, including ToT.

MoU between GRSE and Rolls-Royce Solutions GmbH (MTU) for License production with localization of the MTU 16V4000M73L engine to support the indigenous content for the Next Generation Fast Attack Craft vessel for Indian Navy.

BEML enters into License Agreement for Transfer of Technology (ToT) with R&DEE, DRDO for development and supply of TRAWL Assembly for T-72/T-90 Tanks.

ToT of Shakti EW System from DLRL DRDO to BEL Hyderabad Unit for all system units, Bill of Material, Test procedures, integration & offering methodology.

MoU between Hindustan Aeronautics Limited and Elta Systems Limited, Israel for cooperation on future Business in Maritime Patrol Radar (MPR) for Indian Platforms.

Products

Vertically Launch Short Range Surface-to-Air Missile (Bharat Dynamics Limited): VLSRSAM is a next-generation, ship-based, all-weather, air defence weapon which can be used by Navy as a quick reaction point defence against supersonic sea skimming targets like aircraft and UAVs. The Missile has a smokeless propulsion system with all-weather capability. It has a highly agile

configuration with state-of-the-art Electronic Counter-Counter Measures features.

SAL Seeker ATGM for BMP II (Bharat Dynamics Limited): Semi-Active Laser Seeker based Anti-Tank Guided Missile for BMP-II is a subsonic missile with a range of 4,000 metres and flight time of 25 seconds. The missile weighs 23 kgs with the launch tube and can be used in different kinds of terrains to incapacitate the moving and stationary targets such as tanks and Infantry Combat Vehicles.

Jishnu (Bharat Dynamics Limited): A Drone Delivered Missile, Jishnu is light weight and miniaturised missile targeted for soft-skinned targets. It has a range of 1.5 km with a flight time of 9 seconds. The missile can be semi-automatic or completely autonomous based on the systems configurations.

Software defined NAVIC/GPS receiver module based on indigenously-developed processors (Astra Microwave Products Limited).

Indigenously-built 'Counter Drone Radar' based on technology from DRDO (Astra Microwave Products Limited).

9mm sub-sonic ammunition (Munitions India Limited).

BFT on Ios (ideaForge Technology Limited): BlueFire Touch BlueFire Touch, the Ground Control Station (GCS) software, is built to plan and command both mapping and surveillance missions with the ability to pre-plan missions based on operational area and target locations via waypoint-based navigation.

HF SDR Radio (Bharat Electronics Limited): It is an advanced software defined radio. The radio is lightweight 20 W transmit capable radio. It provides a complete solution to the short-range communication requirements in the crowded HF band and long-range communications beyond line of sight.

Goniometer (Bharat Electronics Limited): It is part of any integrated observation and fire control monitoring system for day time or night time use by the Artillery.

Karnataka Chief Minister Basavaraj Bommai, Chief of Defence Staff General Anil Chauhan, Chief of the Air Staff Air Chief Marshal VR Chaudhari, Chief of the Naval Staff Admiral R Hari Kumar, Chief of the Army Staff General Manoj Pande, Defence Secretary Giridhar Aramane, Secretary, Department of Defence R&D and Chairman DRDO Samir V Kamat, Chief Secretary, Government of Karnataka Vandita Sharma and other senior officials of Ministry of Defence and state government were present during the ceremony.



BEL wins orders worth Rs 4,300 Cr from Indian Army and Navy



The Ministry of Defence (MoD), Govt of India, has signed a contract worth Rs. 3,000 Crs with Navratna Defence PSU Bharat Electronics Ltd (BEL) for supply of Integrated Electronic Warfare Systems for the Indian Army.

The Integrated Electronic Warfare Systems for Indian Army are state-of-the-art with cutting-edge technologies, and have been indigenously developed and manufactured by BEL based on Defence Electronics Research Laboratory (DLRL), DRDO, design. These integrated systems will be a real force-multiplier and will further enhance the electronic warfare capability of the Indian Army in leaps and bounds.

Further, BEL has also received several contracts totalling up to Rs. 1,300 Crs (approx.) during the last fortnight from the Indian Navy for supply of indigenously developed Fire Control, Gun Fire Control,

Surveillance, Tracking, ESM, Sonar Systems, etc.

MoD signs contracts with BEL and Indian Air Force

The Ministry of Defence (MoD) has already signed two contracts worth Rs. 3,800 Crs with BEL for supply of Medium Power Radar and Digital Radar Warning Receiver (RWR) for the Indian Air Force.

The Medium Power Radar (Arudhra) for the Indian Air Force is a state-of-the-art 4D Surveillance Radar equipped with Active Aperture Phased Array Radar technologies based on Solid State TR Module Transmission. The Radar is indigenously developed and being manufactured by BEL based on Electronics and Radar Development Establishment (LDRE), DRDO, design. The above system will further enhance the surveillance capability of the Indian Air

Force with the state-of-the-art modern radar technologies including best-in-class ECCM capabilities.

The Digital RWR for fighter aircraft of Indian Air Force has been indigenously designed and developed by Combat Aircraft Systems Development & Integration Centre (CASDIC), DRDO. The supply of advanced EW Systems will significantly enhance the battle-suitability of IAF fighter aircraft while undertaking operational missions against adversaries.

These are flagship projects showcasing the indigenous design and manufacturing capabilities of the Indian Defence industry led by BEL, involving other public sector and private sector companies and MSMEs. These projects will add another milestone to the 'Atmanirbhar Bharat Abhiyaan' and 'Make in India' initiatives of the Government of India. ■

India-Jordan Meeting on Defence Cooperation

The second Consultative Meeting on Defence Cooperation between India and Jordan was held in New Delhi. The two countries discussed a range of issues including military training and courses, Cyber Security, military exercises, military medicine and capacity building in various

areas to enhance defence engagements. Both sides also exchanged their respective capabilities in defence industry and research & development for forging collaborations in mutually beneficial areas.

The Jordanian delegation also interacted with the representatives of the defence

industry. The meeting was co-chaired by Amitabh Prasad, Joint Secretary, Ministry of Defence, and Brigadier General Hasan Dakhallah Nimer Al-Sbeihat, Director, Directorate of Military Training, Jordan. ■



India International Supply Chain Conference- Aero, Space & Defence (IISCC - AS&D)

3rd EDITION

19 -20 May 2023
Venue: Bangalore

Seminar ✨ Exhibition ✨ Buyer Seller Meet

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Dr Satheesh Reddy
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CMD HAL



Shri BP Srivastava
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Cmde S Mishra
CMD BDL



Shri A Banerjee
CMD BEML



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COM Navy

Requested

Objectives – IISCC-ASD

To facilitate synergy and networking among Indian Aero, Space and Defence Manufacturers, R&D organisations, foreign OEMs, Knowledge and Skilling Partners, and for Strategic Collaboration and sustained Supply Chain development for the benefit of all.

- Supply to Indian Aerospace and Defence Companies, R&D and Armed Forces ■ Export to Global OEMs and their Tier 1 s
- Growth of Supply Chain Partners to Value Chain and Innovation Partners
- Strategic alliance for 'Make in India' with Foreign OEMs and Supply Chains..

Themes for Exhibition and Seminar

✦ Metal components, Plastics, Rubber and Composites, Castings and Forgings, Electrical & Electronics components, Cable Connectors and Looms, Electromechanical and Avionics equipment and Systems, Structural Assemblies., Standard Parts, Adhesives, Paints and other Consumables, MRO of Equipment and Systems.,

- ✦ Presentations from Indian Defence PSUs such as HAL, BEL, BDL, Brahmos, Ship Yards, Ordnance Factories,
- Presentations from Indian Private Corporate such as TASL, L&T, Godrej, Reliance, Adani Group and others. on Supply Chain Development and the way forward.
- Supply Chain Development – Success stories, Expectation of OEMs like Boeing, Airbus, GKN, Lockheed Martin, Pratt & Whitney, Rolls Royce, Safran and others
- Supply Chain Development for major Indian R&D like ISRO, DRDO, NAL, and Technologies for products and processes for transfer to private industry
- Supply Chain requirements for Army, Navy, Air Force & Coast Guard
- Defence Corridors – Benefits to Supply Chain

✦ SERVICES FOR SUPPLY CHAIN DEVELOPMENT

- Supply of Materials & Technologies
- Advanced Manufacturing Equipment and Processes
- Testing & Quality Assurance Support from DRDO, CSIR, Industry Labs, and Certification Agencies
- Financial and Consultancy Services for Supply Chain Development.
- IT services for Design, Manufacture and Maintenance
- Training & Skill Development in all Job Roles including Supply Chain functions
- Export Promotion or ways of enhancing Exports & Incentives.

EXHIBITION - Stalls 6 Sq Mtr and multiples



India International Supply Chain Conference- Aero, Space & Defence (IISCC - ASD)

3rd EDITION

19 -20 May 2023
Venue: Bangalore

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FEW GLIMPSES FROM PAST EDITIONS

Seminar ✨ Exhibition ✨ Buyer Seller Meet

“India, a Potential MRO Hub”



Minister of Civil Aviation and Steel Jyotiraditya M. Scindia has said that India has the potential to become a global MRO Hub. He was speaking on the various aspects of the development of the Indian aviation industry during the CAPA India's Aviation Summit 2023.

Aerospace Manufacturing and MRO, Scindia said that as part of the Make in India campaign, the government has been focussing on ensuring India becomes an integral part of Global Supply Chains, such as in the Aviation Industry. “The launch of private manufacturing for the C-295 transport aircraft by the Airbus-Tata joint venture is a major stride towards achieving the goal of self-reliance. With Indian carriers expected to order about 1500 to 1700 aircraft in near future, we should work towards making India an Aerospace Manufacturing base.

At the same time, we have taken steps to ensure that we develop an ecosystem for MROs for aircraft. We have reduced GST rates on MRO services from 18% to 5% and allowed 100% FDI into the sector. We even liberalized MRO Guidelines. There has been significant growth in MROs since we reduced GST –by 25% (from 113 to 140 MROs approved by DGCA today). I urge our MRO industry to think big, think global, and act global - the sector has a turnover of close to USD 2 billion but our work is limited to 15 to 20 percent of the market today, which we need to ensure is fully tapped into.”, he added.

Scindia said that India has already crossed 4.56 lakh domestic passengers in a day. India will have more than 140 million passengers

in FY 2024 alone, he added. In the six years from FY 2014 to FY 2020 the number of domestic passengers has more than doubled from 120 million to about 275 million at a CAGR of 14.5 % and had there been no COVID outbreak we would have reached a CAGR of about 18-20 %.

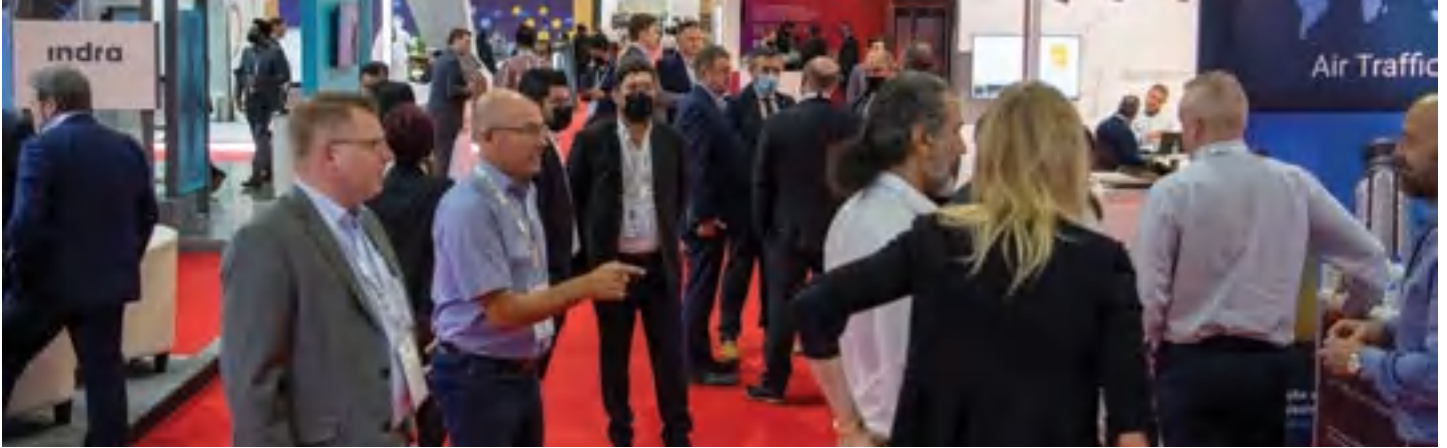
India is the third largest domestic market in the world in terms of seat capacity, but in terms of international seat capacity we are still ranked at the 18th position. Therefore, the prospect for long-term consistent growth in the market seems very strong. India's real GDP is expected to grow to about 252 trillion rupees in FY 2030 and GDP per capita will have increased from that of a lower middle-income country to an upper middle-income country. India is witnessing increasing urbanization, and it is expected to increase from 34.9% in 2020 to a projected 40 % in 2030. The disposable income of middle and high-income households is rising much faster than the national average. India is going to have one of the largest young populations in the World, which usually has a greater propensity to travel.

Commenting on resolving supply-side challenges he said that the Government under the leadership of PM Narendra Modi has been taking unprecedented steps to create capacities, remove bottlenecks and simplify processes so that the nation can have the requisite aviation infrastructure in place. The focus is to ensure that in 2047 when the nation celebrates 100 years of its independence, it has an aviation system that can support USD 20 Trillion economy. As part of this vision, the government has

doubled the number of Airports in the last 8.5 years increasing from 74 in 2014 to 148 now. The union government is simplifying regulations to ensure ease of business in the sector. Policies have been liberalised so as to ensure adequate availability of Pilots, Cabin Crew, Engineers, etc in the country. In the last three years alone, the ATCO staffing position has improved by almost 33% and in comparison, to 2702 filled posts in 2019, today there are more than 3692 filled posts. In addition, we are expecting another 396 ATC staff to be recruited this year.

Speaking on the development of the Drone Industry in the country the Minister said that the size of the Drone market is projected to increase from Rs 2900 Crore in 2020 to about Rs 77,300 Crore in 2025 at a CAGR of 80% and is further expected to reach up to Rs 2,95,000 Crore by 2030. In terms of employment potential, it is close to 3 Lakh people both in manufacturing and Drone Flying. In order to fully realize the potential of Drones for the Indian Economy, several steps have been taken, including notification of New Drone Rules 2021 under which several licenses, fees, and forms have been eliminated. Drone Airspace Map was published on 24th Sep 2021 – 90% of India is now a green zone where no permission is required to operate a drone. PLI scheme has been there to promote Drone manufacturing. As a result, we are seeing widespread adoption of Drones in the country across sectors and an increase in Drone manufacturing, the minister said.

Middle East airport developments entails US \$ 151 Bn. in capital expenditure until 2040



Airport industry players, seeing huge investments coming back on the tracks, will get into an energized enthusiasm at the Airport Show 2023

After most of the multi-billion dollar airport construction projects were put on the back burner or temporarily curtailed over the past three years, operators and investors have been racing down the tarmac as the Middle East and Asia-Pacific regions are expected to account for 58 per cent of the global air passenger demand in 2040.

The CAPA - Centre for Aviation, one of the world's most trusted sources of aviation market intelligence, says there have been 425 major construction projects at existing airports, with US\$450.7 billion in total committed expenditure globally, each of which is at various stages, from preparatory to about to conclude, along with 225 new airport projects and airport investor numbers swelling to 1074, including 258 airport operator groups or consortiums. Its database has region-wise listed the total numbers of the airport project and the volume of investment include 155 in Middle East worth US\$209.4 billion.

The Middle East region, positioned at the strategic crossroads of major economies of Asia, Africa and Europe, has transformed into a major international hub and continues to be an inspirational growth story. With over 110 airports, this is already among the fastest growing in the world, accounting for 170 million of the global traffic.

Airports in the Middle East will need to invest US\$151 billion in capacity expansion as the global air passenger demand is expected to increase more than two-fold in 2040. "This necessitates an investment totaling US\$2.4 trillion for Middle East

and Asia-Pacific airports until 2040 to accommodate this growth," the Airport Council International said. The ACI forecasts close to 19.7 billion passengers are expected to traverse the world's airports by 2040 and the Middle East airports will handle 1.1 billion passengers by 2040 – a significant increase from 2019's 405 million.

The airport industry's growth story is far from over as new airports are coming up and existing facilities getting expanded and upgraded to meet future passenger demands. The airport industry players, seeing the huge investments coming back on the tracks, will get into an energized enthusiasm at the Airport Show in Dubai from May 9 to 11. It will be held under the patronage of His Highness Sheikh Ahmed bin Saeed Al Maktoum, President of Dubai Civil Aviation Authority, Chairman of Dubai Airports and Chairman and Chief Executive of Emirates Airline and Group.

The 22nd edition of the world's largest annual airport industry B2B platform will connect over 200-plus aviation brands and 100-plus buyers from over 30 airports and aviation authorities from 20 countries. Also taking place on the sidelines of the Airport Show is the Global Airport Leaders' Forum (GALF).

The high-profile global platform will see over 4,500 visitors, and exhibitors have been confirmed from the United States, Italy, France, Germany, Denmark, Turkey, Netherlands, China, Belgium, Korea, Sweden and the UAE. May Ismail, Event Manager at Reed Exhibitions, its organizer, said the Airport Show-2023 will see almost everything

that airports require being on display. The 2022 edition witnessed 4,200-plus attendees from 71 countries and over 160 exhibitors from 23 countries and 100-plus buyers from 35 companies and 23 countries along with five country pavilions. This edition will break those records for sure as aviation is coming back in its full splendour.

According to GlobalData, the total pipeline of new airport construction projects had a combined value of US\$1.64 trillion while the global fleet of aircraft is projected to touch 36,500 aircraft by 2031 and the global airport construction market size has been revised to US\$1.4 trillion by 2026. There are several countries which are pursuing airport developments at a break-neck speed now.

India, the world's third-largest civil aviation market, plans to increase to 220 operational airports by 2027, up from 141 now. Its most populous neighbour, China, is expanding and by 2025 will have more than 30 civil airports with a targeted capacity of two billion passengers. Indonesia, Vietnam and the Philippines to are in the race to catch up with new airport developments. Turkey's TAV will continue its investments in Almaty and Antalya airports in 2023 and it is building a new terminal and additional units in Almaty with an investment of US\$200 million to double the capacity to 60 million. TAV will start investing in Esenboğa Airport in the Turkish capital Ankara. Oman Airports has inked a MoU to develop Kilimanjaro Airport and an ambitious plan is to develop a southern Africa hub in Harare in Zimbabwe.

DRDO workshop on 'Human Factors Engineering in Military Platforms'

The Defence Research & Development Organisation (DRDO) organised a two-day workshop on 'Human Factors Engineering in Military Platforms' in New Delhi.

The workshop was organised by Defence Institute of Physiology and Allied Sciences, a DRDO laboratory, to address the need and future roadmap for implementation of Human Factor Engineering in product life cycle of indigenous products.

At the end of the deliberations by stakeholders from Armed Forces, CAPF, Industry and DRDO, a panel discussion was chaired by Scientific Advisor to Raksha Mantri Dr G Satheesh Reddy. Secretary Department of Defence R&D and Chairman DRDO Dr Samir V Kamat; DG Armoured Corps Lt Gen Karanbir Singh Brar; DG ITBP Shri Anish Dayal; ADG Infantry; ADG, Army Design Bureau; ADG, Warship Design Bureau; Director Generals of DRDO and senior officials from Tata Advanced Systems Limited (TASL), Larsen & Toubro (L&T), MKU, Hindustan Aeronautics Limited (HAL), Mazagon Dock Shipbuilders Limited and Hindustan Shipyard Limited (HSL) were also



present.

Recommendations related to inclusion of chapter on Human Factors Engineering (HFE) in design document for all indigenous products and formulation of policy with the involvement of users were made. Generation of Anthropometry database of Indian soldiers and creation of Indian Standards were emphasised by all the panel members.

Dr. Satheesh Reddy suggested inclusion of Human Factors Engineering (HFE), as

desirable parameters in Preliminary Services Qualitative Requirements (PSQRs). DIPAS has been entrusted with the responsibility to drive implementation of HFE through interaction with stakeholders and formulation of required policies and standards.

The DRDO Chairman emphasised that inclusion of HFE in design and development of indigenous products will be a leap forward towards realising the vision of 'Aatmanirbharta' in Defence. ■

DGCA Approves Modification for Hindustan-228 Aircraft with 19 Passengers

A new variant of HAL aircraft 'Hindustan 228-201 LW' has been approved by the DGCA.

This variant has maximum take-off weight of 5695 kgs with 19 passenger capability. With this modification, the aircraft would fall in the Sub 5700 kg aircraft category. This variant provides several operational benefits for operators such as reduced pilot qualification requirement enabling pilots with Commercial Pilot License to fly the aircraft, enhanced availability of pilot pool for the aircraft and reduced operational cost. In addition, the new variant will result in reduced training requirement for flying and ground crew including aircraft maintenance engineers.

HAL also has approval for 6200 Kgs AUV with 19 passenger capability.



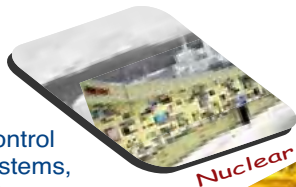


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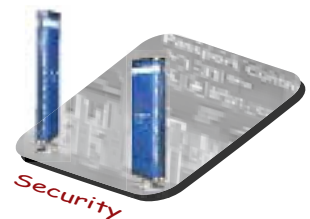
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Aerospace

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- 1st**
- In attracting investments
 - In India Innovation Index
 - In R&D Centers
 - In the number of Startups



KARNATAKA UDYOG MITRA

- A Government of Karnataka organization constituted under the aegis of the Commerce & Industries Department.
- State Single Window Agency for approval of investment proposals in the state.
- Dedicated Investment Promotion & Facilitation agency of the state, handholding investors across their journey.
- A 'Single Point of Contact' for all Investors & Businesses in Karnataka.
- **India's top Investment Promotion Agency**
The National Investment Promotion and Facilitation Agency 'Invest India' has rated Karnataka Udyog Mitra as the top IPA agency in the country.
- The State being a "Top Achiever" in Ease of Doing Business index, Karnataka Udyog Mitra ensures the effective implementation of EODB reforms.



SCAN

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As enshrined in our Constitution, "to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievement" is the fundamental duty of every citizen of India.

Source: <https://eodb.dpiit.gov.in/>

Gunjan Krishna, IAS
Commissioner for Industrial Development &
Director of Industries & Commerce

Dr. E. V. Ramana Reddy, IAS
Additional Chief Secretary to Government,
Commerce and Industries Department

