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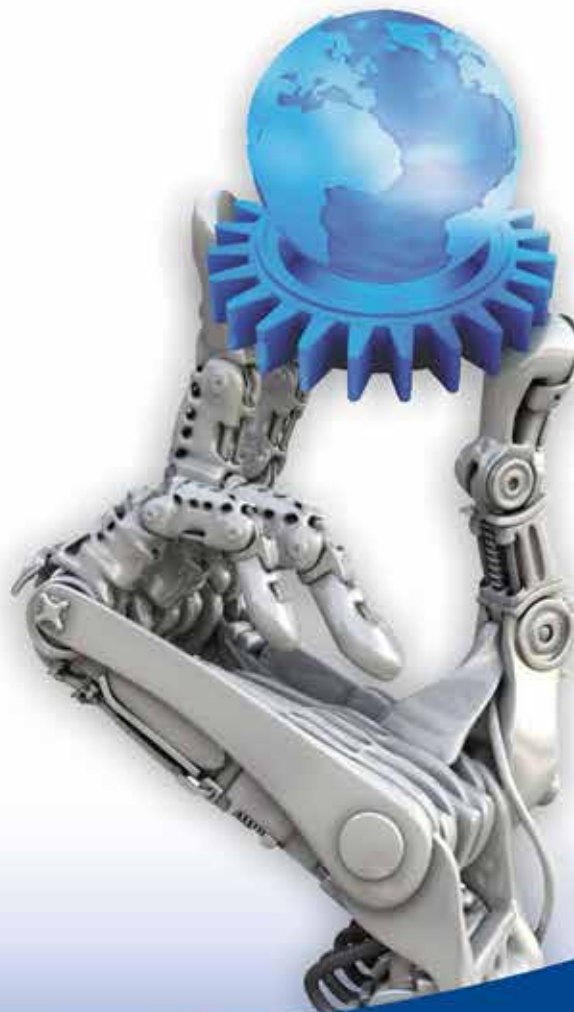
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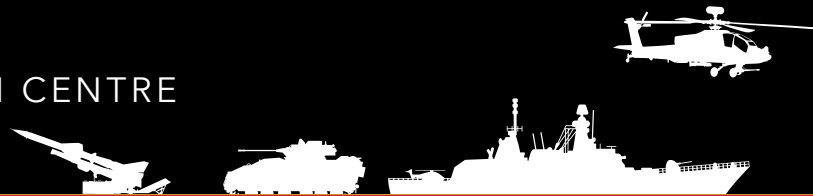


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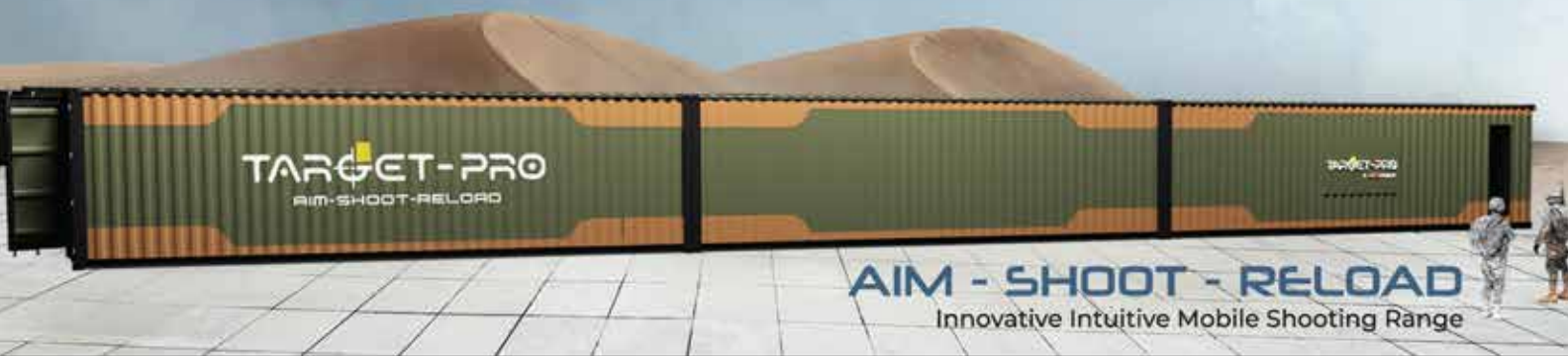
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Touching the Skies with an 'Eye on Future'



Air Chief Marshal Vivek Ram Chaudhari PVSM, AVSM, VM, ADC
Chief of the Air Staff, Indian Air Force

While talking about the integration of all elements of national security apparatus, the Air Chief Marshal (ACM) VR Chaudhari, Chief of the Air Staff, Indian Air Force, recently said about an 'All of the Nation' approach, we cannot be restricted to only joint operations of the armed forces. "The legacy mindset that the aerospace domain only becomes relevant when conventional war breaks out has been proven wrong. We have seen this in the Balakot and post Balakot periods and the increased air activity along the LAC in Eastern Ladakh. Aerospace power is scalable, and very amenable for signalling. There is adequate scope of employment below the threshold of conventional war. Thus, appropriate resident expertise on aerospace matters needs to be incorporated in decision-making and support bodies when considering response options in both continental and maritime domains," said the CAS. Speaking to Aeromag on the occasion of the 90th IAF Day, CAS talks about how the force counters Chinese actions in the South East coast, the Agniveer scheme and revamped training programme of IAF, latest updates of indigenisation and the modern challenges in aerial warfare.



Glimpse of the Air Force Day Parade 2022, in Chandigarh on 08 October.

Taking stock of the geopolitical fallout of the political instability and social turmoil in Sri Lanka in the Indian Ocean region, given China's strong intent and motivation to interfere, do we have to shift our focus now to our South East Coast from the eastern and western border contingencies?

Whilst it is clear that China has the desire, and increasingly, the capability to interfere in affairs in the IOR, so far, it has not had the necessary staying power for military interference. When we talk of the defence forces shifting focus, we must keep this in mind. The disagreement on boundary issues is along the northern borders and not the maritime domain. Neither is there a permanent and contiguous Chinese military presence close to the SE Coast. However, with an eye on the future, the IAF has improved its capabilities in this region with fighter deployments and joint exercises with the Navy.

You have spoken of an 'All of Nation Approach,' integration of all elements of national security apparatus. What would be your priorities in promoting synergy and streamlining joint operations among the three services?

When we talk of the 'All of the Nation' approach, we cannot restrict ourselves to only joint operations of the armed forces. What I referred to was the incorporation of all relevant departments of the government into evolving a cohesive

national response. To a great extent, we have seen this evolve through some empowered multi-ministerial coordination bodies. The legacy mindset that the aerospace domain only becomes relevant when conventional war breaks out has been proven wrong. We have seen this in the Balakot and post Balakot periods and the increased air activity along the LAC in Eastern Ladakh. Aerospace power is scalable, and very amenable for signalling. There is adequate scope of employment below the threshold of conventional war. Thus, appropriate resident expertise on aerospace matters needs to be incorporated in decision-making and support bodies when considering response options in both continental and maritime domains.

Are you overwhelmed by the onrush of responses to the Agnipath Scheme? In the changing dynamics of air warfare, how do you address the need for technology intensive training in the overall framework of short-term Agnipath service?

The Indian Air Force has been a popular choice for the youth. The excellent response to the 1st batch of Agniveer is an affirmation of the trust that youth places in the IAF and its ability to transform their life for the better. Yes, we are happy with the response to the Agnipath Scheme.

Air Force is a technology-intensive force. To achieve the requirements of well-

trained Agniveers for technology intensive Air Force, we have undertaken to revamp the entire pattern of training. The new pattern of training is a combination of structured and on-the-job training with a short initial training period followed by work experience. Depending upon the demonstrated proficiency, each Agniveer Vayu will undergo further two sets of upskilling modules. We expect that by progressively exposing our Agniveers to more complex jobs along with upskilling modules, the requirements of IAF will be met.

During the structured on-the-job training the focus will be on learning appropriate skills along with foundational knowledge. Modern learning tools and simulators will be used extensively.

The most intricate tasks of repairing complex technical items will remain restricted to the experienced technician. The Agniveer that are retained in the Indian Air Force after their initial four years will be imparted additional training for this purpose.

On the side-effects of the Russian-Ukraine conflict, does it in any way affect our defence products delivery schedules from Russia or the Western countries? What are our alternatives?

The Russia-Ukraine conflict has not affected the defence product delivery schedules from western countries. The



conflict has thus far had a limited effect in terms of delivery schedules from Russia and Ukraine. However, there has been no effect on our Op capability.

Minor delays in the supply of spares and repairs pertaining to equipment of Russian / Ukrainian origin are being closely monitored. However, it does not have any immediate impact on our readiness. Indigenisation efforts are also being expedited in tandem as a fallback in the longer term. For instance, complex rotables have been identified for ROH / Indigenisation under the Make-II scheme. For transparency and visibility to Indian development partners, all indigenisation requirements are posted on the IAF website and Srijan defence portal.

Could you share with us your vision on the new domains of warfare for the air warriors on the occasion of the 90th anniversary of the IAF?

The defence services the world over have been structured, manned, equipped, and trained for the conduct of warfare as we have known it in the classical sense. However with time and technological advancement, there has been a growing dependence on networking. Simultaneously, there has been a huge rise in the cost of war, as destructive power of weapons has increased manifold. Furthermore, kinetic action is a clear crossing of the tolerance threshold in most cases, and is easily attributable with

attendant consequences of a response.

So, in this backdrop, the cyber domain has emerged as a key domain of warfare. A successful cyber-attack can cause prohibitive, but usually, non-lethal losses, cause a huge loss of functionality or even capability, and serve as a good coercive factor. More importantly, it is difficult to attribute such attacks, and this is what makes them so attractive in No War No Peace situations. Our adversaries have invested a lot in creation of such capabilities. The best defence against such capabilities is a disciplined cadre of air warriors. This is something we lay great stress on, with a zero tolerance policy. The IAF was the first among the services to implement a pan-India service-specific network, and Network Centric Operations have only grown since then. Cyber defence measures, awareness, procedures, and training are areas of focus. Our systems and procedures are robust, but also subject to constant review and upgrade.

In the same manner, the domain of space is now inextricably linked with nearly all aspects of our operations today. From communications to sensors of all kinds, the dependence on our space assets, and hence their criticality is extremely high. We have a tri-services agency that has been established to focus exclusively on this domain. Nevertheless, as the lead aerospace agency, the IAF has adopted a policy of boosting expertise in this critical domain. We have always maintained

that space was but an extension of the air medium. Even today, there are extant technologies that allow for a direct interaction between air and space platforms. But emerging technologies and platforms will erase the difference between the two and permit seamless transits between air and space.

It is imperative that we understand these, adopt a future-oriented outlook and develop such capabilities as well. 'Near Space' as the intervening region between air and space will be a crowded area in times to come. And with the ability to dominate it will come a far greater ability to influence and support space operations. In fact, the domain of air will be critical to controlling the domain of space. Together with other government agencies a composite effort to develop capabilities to safeguard our interests has been put in place. The IAF will be in the vanguard of this process. Air warriors today need to understand this, train, plan and execute so that they may master it tomorrow.

On the threshold of the tenth decade of the IAF, could you spell out 10 unique highlights, updates to look forward to for the Indian Air Force vis-a-vis the force optimization drive and indigenisation of defence production?

The indigenous LCA (Tejas) programme has now matured. 16 IOC version aircraft and 14 FOC version aircraft are with the IAF. Delivery of the recently contracted 83



aircraft will commence by January 2024 and these will be used to resurrect some of the number-plated Squadrons. The major improvements include incorporation of Active Electronically Scanned Array (AESA) Radar, Electronic Warfare (EW) suite, Beyond Visual Range (BVR) missiles and mid-air refuelling capabilities. IAF is also tirelessly working to enhance the operational capability of the LCA by installing newer systems and integrating additional weapons.

The two Squadrons of the Rafale are operational at their respective bases. Now we have shifted focus on the MRFA programme and extensive discussions are ongoing within the prospective

participants. The entire case is being realigned to ensure continued relevance of the platform and its capabilities hold us in good stead for at least the next four decades.

The indigenous development of LCA Mk 2 and AMCA is being progressed through DRDO and detailed deliberations are underway. Suffice to say that both the programmes have gained sufficient momentum and as soon as certain technical details are straightened out, both these projects will be launched in the near future.

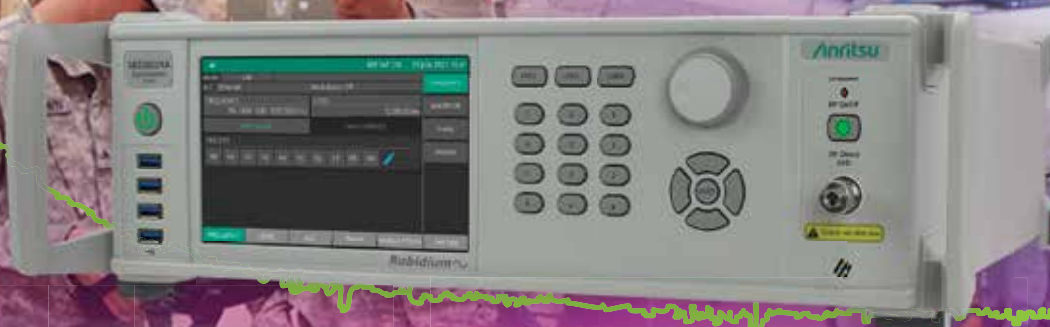
The IAF transport fleet is well rounded and the C-295 aircraft with a major Make-in-India component will allow the IAF to

replace its ageing Avro aircraft. On the rotary wing front, the IAF has managed to do rather well. Deliveries of attack and heavy lift helicopter for 22 Apache AH-64E and 15 Chinook CH-47 have been completed with the formation of two units for each type. The Russian Mi-17 V5 programme has also been completed with 130 plus helicopters having been delivered. The IAF has also acquired a large number of the indigenous ALH (Dhruv) helicopters. We also plan to acquire the Indian Multi-Role Helicopter currently being designed and developed by HAL. Upgrade of the Mi-17 legacy helicopters is also in progress.

Recently, the IAF has inducted the Light Combat Helicopter in the Limited Series Production version. Upon successful induction, further procurement of this versatile platform will be initiated. The IAF plans to acquire 55 more LCH in the near future. Capability enhancement of the helicopter fleet is an ongoing process with IAF. Induction of new missiles, EW systems, systems to allow operations in a degraded visual environment, combat SAR capability and networked operations are either ongoing or in the pipeline.

Since their induction, the existing three Phalcon-based IL-76 AWACS aircraft have been fully operationalised, networked and integrated. In addition, all three Embraer E145 platforms with the indigenous

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The President of India , Droupadi Murmu, Defence Minister Rajnath Singh and the Air Chief Marshal V.R. Chaudhari watching Air Display organized to commemorate Air Force Day 2022, in Chandigarh on 08 October.

AEW&C development by DRDO have been delivered and operationalised. Additionally, the next generation AEW&C based on the A-321 will be developed by DRDO. IAF is also procuring Medium Power Radar (Arudhra), High Power Radar, Ashwini Radar and Mountain Radar for ensuring a gap free AD Coverage of its airspace.

To augment its mid-air refuelling capability, the IAF is progressing the case for procurement of six FRAs. To make the project economical, we may also go in for pre-owned FRAs as long as they meet the operational requirements. As this process will take some time, a case for leasing one FRA to augment our training requirements

has also been initiated.

Special focus is being given to enhancing our UAS capabilities across the spectrum. The IAF has been designated as the lead service to progress the procurement of MALE UAVs for all three services.

The long-pending requirement of upgrading the existing fleets of Heron UAV is now being re-aligned to Make-in-India provisions. Technical discussions are on-going with the OEM and a prospective Indian agency to find a common path ahead. The advent of small, mini and micro UAVs has opened up a new challenge and to counter such threats, we have taken multiple approaches. All the Counter UAS systems are designed and developed in

India, with hand-holding and guidance from the IAF. These systems are gradually being inducted. The IAF has an additional requirement of 106 BTAs (Basic Trainer Aircraft). Towards this, HTT-40 from HAL will be inducted soon.

The IAF had opted for the indigenous Akash SAM systems, eight squadrons of which have been inducted into service, with seven more in the process of induction. In addition, DRDO's project to develop and deliver the MR-SAM is progressing satisfactorily with the induction of three Sqns having been completed. The IAF has also operationalised the S-400 system and the rest are being delivered as per schedule. ■



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MSMEs: Destined for a Bigger Role in Defence



Around 12,000 Micro, Small & Medium Enterprises (MSMEs) are currently operating in India's aerospace and defence sector. In recent years, realizing the importance of MSMEs, the Government of India has launched several policy initiatives aimed at enhancing their presence in the sector

The Government of India (GoI) has laid stress on promoting Micro, Small & Medium Enterprises (MSMEs) to achieve its goal of Aatmanirbhar Bharath (self-reliance) in defence. Already, MSMEs are playing a major role in the country's aerospace and defence sector, with around 12,000 such units operating, according to data collected towards the end of 2021.

In the Union Budget of 2022 also, the GoI announced several measures intended to provide a thrust to MSMEs in defence. For instance, 68% of the capital procurement budget is to be reversed for domestic industry in 2022-23 and 25% of defence R&D budget has been earmarked for

industry, start-ups & academia. Moreover, GoI has established two Defence Industrial Corridors in Uttar Pradesh and Tamil Nadu. Tamil Nadu has over 120 companies in aerospace component manufacturing now.

Policy initiatives

In fact, during the previous few years, GoI has launched many policy initiatives for promotion of MSMEs in the defence sector such as the Defence Acquisition Procedure (DAP) 2020, in which there are specific reservations on orders up to Rs 100 crore per year for MSMEs. Similarly, an innovation ecosystem for defence named 'Innovations for Defence Excellence

(iDEX)' was launched in April 2018. iDEX aims at creation of an ecosystem to foster innovation and technology development in aerospace and defence by engaging industries including MSMEs, start-ups, individual innovators, R&D institutes, and academia and provide them grants/funding and support to carry out R&D which has potential for future adoption for Indian defence and aerospace needs.

The Defence Offset guidelines have also paved the way for proactive participation of MSMEs of India by incorporating a scheme of multipliers of 1.5 for engaging MSME as Indian Offset Partners (IOP), which promotes their integration in the global supply chain.

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Support by DRDO, DDP

MSMEs are important partners in projects of the Defence Research and Development Organisation (DRDO), which transfers its technologies to them. In fact, MSMEs are a crucial part of the industry ecosystem to produce DRDO-developed products. DRDO, through its Technology Development Scheme (TDF), funds industries - especially start-ups and MSMEs - up to an amount of Rs 10 crore

for innovation, research, and development of defence technologies in the field of aerospace and defence.

Meanwhile, the Department of Defence Production (DDP) conducts outreach programmes in various parts of the country to interact with industry associations, industry - especially MSMEs - and academia, to spread awareness about the potential export opportunities. A scheme aimed to promote MSMEs in defence is in place. Under this scheme,

conclaves/ seminars are organised in Tier II and Tier III cities across the country having a strong presence of industrial MSMEs with the support of the DDP.

Regular interactions are taking place to settle the grievance of vendors at Defence Public Sector Undertakings (DPSUs). A Defence Investor Cell has been opened in DDP to address the issues being faced by vendors, especially MSMEs.

The procurement by DPSUs/erstwhile Ordnance Factory Board (OFB) from





MSMEs during the last three years was as follows: In 2018-19, while the value of the procurement was Rs 4,842.92 crore, it was Rs 4,603.95 crore in 2019-20 and Rs 5,463.82 crore in 2020-21.

The Ministry of MSME through its 18 Tool Rooms and technical institutions spread across the country imparts training in the field of tool making and allied

trades to youth as well as MSMEs and its workers, including during the COVID-19 pandemic period. DPSUs also organise various Vendor Development Programmes (VDP), Skill Development Programmes and webinar sessions on a regular basis for MSME vendors. Online support and guidance are provided to MSMEs for registration and for uploading the tender

on Government e-Marketplace (GeM) and National Informatics Centre (NIC) portals by DPSUs. In addition, the Ministry of MSME imparts training and upgrades/develops skills of unemployed youth and MSMEs through various programmes/schemes.

Among these initiatives is the National SC-ST Hub Scheme, under which skill training/entrepreneurship development programmes are organised for aspiring and existing SCs/STs entrepreneurs through various Training Institutions across the country.

Under the 'Prime Minister Employment Generation Programme' (PMEGP) Scheme, all beneficiaries are mandatorily provided with Entrepreneurship Development Programme (EDP) training through online/offline mode before setting up their units.

Moreover, contracts worth Rs 53,838 crore for 31 types of equipment have been awarded by the Armed Forces to the domestic industry since notification of the two Positive Indigenization Lists.

12,000 MSMEs in defence

According to experts in the aerospace and defence sector, small businesses can play a larger role in the defence sector. In December 2021, Defence Minister Rajnath Singh announced that around 12,000 MSMEs are operating in the defence





industry in India and the exports from the country crossed the Rs 38,000-crore mark in the last seven years. He had said that the MSMEs will play a greater role in meeting domestic and international requirements.

Meanwhile, an official in the Govt's Defence Ministry said that India is heading towards a future where it may not have

to resort to any imports in the aerospace and defence sector. He added that India is undergoing a 'liberalisation of defence production' wherein more private sector companies will be brought into the ecosystem.

At the same time, a DRDO official recently said that local businesses and

out.

Apart from encouraging innovation within the aerospace and defence sector, collaboration in the form of joint ventures, signing MoUs between global original equipment manufacturers and Indian MSMEs should be the focus, said another expert.

start-ups can design complete systems for the military research and development agency. He said this would help in creating strong and local supply chains and enhance the overall ecosystem.

Yet another expert, who was earlier with the OFB, said that manufacturing in India brings the production costs down. He also suggested that MSMEs need to focus on making products that are quality-driven because defence products are 'highly optimally designed' and they should meet all certification and standard requirements.

MSMEs are at the 'heart of aerospace and defence production' said the top official of a global firm. "The challenge for larger companies is to integrate small businesses into global supply chains," he pointed



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MAG5 Innovations: Pioneers in Container-Based Shooting Ranges



Anil Girkar
Founder Director
MAG5 Innovations Private Limited

Creating new products with innovative technologies takes a lot of effort. MAG5 Innovations Private Limited has achieved success in this regard by introducing container-based mobile shooting ranges. Anil Girkar, Founder Director of the company, explains how the product took shape, its functioning and advantages

Could you tell us about the inception of the company and the journey since then?

During the times of the COVID-19 pandemic, our parent company which is into LED manufacturing, rentals and sales was completely shut down and struggled for existence. So, we thought differently and put our brains and efforts towards new technologies, and soon registered MAG5 Innovations Private Limited with Startup India.

I have always been fascinated by innovative technologies and having an Army background, I pondered over how we could address the issues related to shooting training in the armed forces. So, we came up with the idea of mobile shooting ranges and engaged in extensive research activities. In fact, we carried out numerous techno-driven brainstorming sessions and challenges for almost two years. New technologies are always bumpy rides, especially regarding the finances.

But, after all the hard work, we have created certain niche products in shooting ranges and feel very much satisfied. We have now applied for three patents for our

research in shooting ranges.

What are the products and services offered by you?

Container-based mobile shooting range is a new concept and only four or five countries in the world possess this technology. We conducted a detailed study about the India-specific requirements and technology available at the international level in this field. Following which, different ideas as well as concepts were researched and implemented. As a result, our products and services entirely match the real war and riot situations. This helps the shooters to programme their mind for dealing with the actual events.

We offer two types of shooting ranges. One is 'Target Pro' for army and paramilitary forces and the other is 'Target Sports' for sports arenas. The USP of our shooting ranges is the distraction mode, which we designed especially for the defence and paramilitary forces. In this mode, there is 8D sound to create the real mode war situation and riots through a shaking platform. The whole range is



covered with an intelligent lighting system where we can create any situation as per the requirements.

There is also an errant shot detection facility, customisable protection protocol, staff notification and smart range axis notifications. Gunshot detection, auto desk shoot mode, hide-and-shoot mode, automated shaking platforms, conical-shaped bullet trap system and solar system are some of the techno inbuilt product specialities in our mobile shooting ranges.

Could you elaborate on the idea of 'Target Pro' container-based shooting range, which is an innovative product from the company?

A typical shooting range is time-consuming, stagnant, space consuming



and immovable; whereas, a container-based shooting range with retrieval system is prudent in time management, mobility, saves spaces and is operative anytime, anywhere, with the most-modern smart range information system. The idea behind a container-based facility is to make shooting ranges more adaptive, easy to operate and superior in training methodologies.

How does 'Target Pro' outweigh a typical shooting range? How safe is it?

Contemporary shooting ranges need huge areas, sanctions from the

like the M855 and have the least back face deformation of any category. They also have a long shelf life, with a proper anti-frag coating and plate carrier.

Door-locking system with rifle placement after the shooting is predetermined as per safety protocols. The inside door is locked with its protection management system and the shooter cannot open this door as per his will. In fact, the door will not be opened/unlocked without placing the rifle in its safest position as per procedure.

There is a pre-psychological test, a weapon locking and unlocking protocol, door locking and unlocking after usage of the weapon with visual checking and a weapon-keeping protocol. A conical-shaped bullet trap system makes the range safer as it buckets the misfired bullets from any direction with precision. Fire and theft protection for guns and ammunition is also installed in the mobile shooting range.

What are the other highlights of the container-based shooting range? Could you describe the specifications of the retrieval system?

A container-based shooting range is

PID controller. It also includes a hall sensor for self-calibration of the apparatus. Patent has been applied for this product.

The carriage unit is mounted on one or more tracks and includes at least one motor configured to drive the carriage unit on the tracks. The carriage unit further includes a plurality of rollers driven by the motor for its smooth forward and backward movement.

A control unit controls the motor which drives the carriage unit and includes an encoder and a proportional integral derivative (PID) controller. The encoder can be of the optical rotary type and calculates the distance travelled by the carriage unit in terms of number of revolutions of a motor shaft coupled to the carriage unit, where the encoder transmits a pulse signal per revolution of the motor shaft. The PID controller monitors the distance travelled by the carriage unit and accuracy of the travelled distance of the carriage unit and, accordingly, calculates the errors therein. The camera unit is mounted on the carriage unit and is configured to capture images of a target for score



government authorities, safety protocols and large operative expenditures. They do not have technology adaptations or an individual approach. We address these issues through innovative technologies.

Successfully-tested AR500 armour steel makes our container-based range safer. It has unparalleled multi-hit capabilities with 360-degree protection - 5 mm on the sides and 6 mm at the bottom. AR500 body armour plate has the ability to stop/sustain high velocity military bullets of 5.56 and 0.30 calibre.

Our shooting range is built to perform well against steel core 'penetrator' rounds

designed, developed and technologically adapted for real war situations and shooting perfection through continuous training. It has mobility and easy access with meticulous MIS assessment, which will massively change the skill set of each firer, making him better equipped for any kind of situation. The shooting range has a rugged design and it can be used in any terrain with a 360-degree layer of protection.

Our 'Interactive target retrieval system' auto tunes the distances of the shooting targets with precision as per the command. The control unit includes an encoder and

calculation. Meanwhile, the target-holding unit is mounted on the carriage unit and is configured to hold and rotate the target. The target-holding unit includes a second motor, which is a stepper motor for precise rotation of the target.

Who are the target customers of the products? Are you aiming at exports?

Obviously, the customers are the armed forces, paramilitary forces, sports and government bodies, clubs and training centres. We are certainly looking forward to making a presence in the international arenas.



Machine tools show 'ACMEE 2023' in Chennai during June 15-19



Organised by Ambattur Industrial Estate Manufacturers Association, ACMEE 2023 will cover the broad areas of machine tools, metal forming, metrology, and industrial robotics & automation with particular emphasis on digital manufacturing

K. Sai Sathya Kumar
Chairman, ACMEE 2023

ACMEE 2023, India's premier international machine tools show, will be organised at Chennai Trade Centre, Chennai during June 15-19, 2023. This is the 15th edition in the biennial event. The success of ACMEE is mainly due to the participants presenting the latest in machine tools and the ability of the organisers, Ambattur Industrial

Estate Manufacturers Association, to arrange the visit of CEOs and top decision-makers of the engineering industry from all over India.

ACMEE 2023 will cover the broad areas of machine tools, metal forming, metrology and industrial robotics & automation with particular emphasis on digital manufacturing. Machine tools play

a very important role in manufacturing, be it automobiles, aircraft, medical equipment or consumer durables.

ACMEE 2023 will be held over a covered area of 18,000 sq m spread across six halls. Incidentally, 85% of the exhibition space has already been sold out, with 330 participants, including world leaders, having confirmed their participation. The list of participants is a who's who of the industry and many of them have indicated that they would be launching new products and technologies at ACMEE 2023. In fact, such launches have been a regular feature of all ACMEE editions. Moreover, 29 leaders in machine tools are associating with ACMEE 2023 as sponsors.

An interesting feature of ACMEE is that many participants exhibit machine tools and technology relevant to the MSME sector. Technical sessions also take place concurrently.

ACMEE is an UFI-approved international event, which is a recognition by the Global Association of Exhibition Industry for high standards of professionalism.

ACMEE 2023 is a B2B event open to industry professionals and prior registration is required. Visitor registration is facilitated online at www.acmee.in



Government approves creation of Weapon Systems branch in IAF

In a historic step for the Indian Air Force (IAF), Government has approved the creation of a new branch, called the Weapon Systems (WS) branch. The creation of WS branch would entail unification of all weapon system operators under one entity dedicated to the operational employment of all ground-based and specialist airborne weapon

systems.

The branch would encompass operators in four specialized streams of Surface-to-Surface missiles, Surface-to-Air missiles, Remotely Piloted Aircraft and Weapon System Operators in twin/multi-crew aircraft. The branch will contribute immensely by enhancing the war fighting capability of the Indian Air Force.



Stephen Balaram: Providing reliable high pressure technology solutions



Stephen Balaram Engineering Pvt. Ltd. has been providing solutions in high pressure technology to customers across India over the past 48 years. Today, the ISO-9001-2015 quality certified company is a leading player in specialist system solutions designed and engineered in-house with the strong support of internationally reputed overseas principals such as Haskel (Burbank, California, USA) and Nova Swiss (Switzerland).

The company has an enviable reputation for providing high-quality, robust, and reliable solutions, backed up by professional after-sales service support. A dedicated team of trained and experienced personnel ensures prompt supply of spare parts and repair services for all equipment supplied by the company.

Stephen Balaram Engineering has successfully supplied hydraulic systems

operating at 7,000 bar / 100,000 psi and gas systems operating at 2,400 bar / 36,000 psi, with capability to cater to requirements as high as 10,000 bar / 145,000 psi.

Special workshop facilities include:

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- Class # 100 Laminar Flow Booth
- Ultrasonic Cleaning bath
- Test bench for trouble-shooting high-pressure devices

Typical solutions for the Defence / Aerospace Industry include:

- Ultra-High Purity Gas filling stations (with metal diaphragm compressors suitable for 99.99995% pure gas filling) as necessary for JTC devices
- Xenon gas charging stations
- Hydrogen gas boosters & H₂ gas filling stations, for Fuel Cell applications
- NOVA SWISS high pressure 1,000 bar solenoid valves for Hydrogen service
- Aviator OXYGEN gas boosters for aircraft life support bottles
- Nitrogen gas boosters for aviation ground support
- Portable self-driven Nitrogen gas boosters for helicopter pop floats, charging hydro-pneumatic vehicle suspensions, topping up of gas filled hydraulic

accumulators, etc.

-Ultra high-pressure intensifier systems for component Autofrettage up to 10,000 Bar

-Hose proof & burst pressure test benches for pressures up to 4,000 Bar

- HELIOX Dive Gas Recovery systems

-Carbon dioxide + Nitrogen filling stations for survival craft, etc.



-Portable hydraulic high pressure power packs for oil injection for pressures to 3,500 bar.

Visit the company's website/web pages at:

Website: www.sbengg.com

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Indigenization of 72 Items by DPSUs before Original Timelines

Putting Atmanirbhar Bharat on fast track, 72 items out of total of 214 items mentioned in 1st and 2nd Positive Indigenization List (PIL) have been indigenized by Defence Public Sector Undertakings (DPSUs) well before their original indigenization timelines of December 2023, December 2024, and December 2025.

The remaining 142 items are being indigenized within the timeline of December 2022. Some of the main Sub-systems/ Line Replacement Units (LRUs) indigenized include Magazine Fire Fighting System for Ships, Steering Gear System and Fin Stabilizers with Control for Frigates, Pressurized containers for Akash Missiles, KOE charge for Konkurs Missiles and Electric Motor, Decontamination set and Prism optical instrument for Battle Tanks.

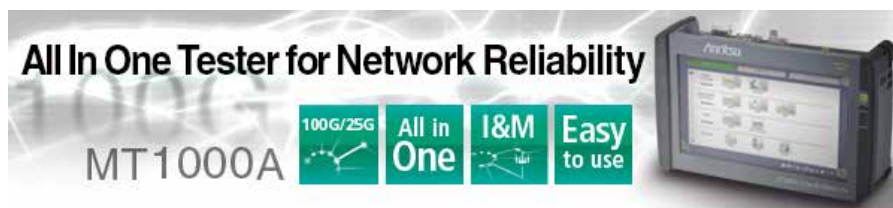
Beside these items, some critical components include Intermediate Castings for Helicopter, Polychropene Rubber Band for Submarines and High Pressure Regulating Valves for Ships. Details of all the indigenized items are available on "SRIJAN Portal

(srijandefence.gov.in)".

It is notable that in pursuit of self-reliance in defence manufacturing and to minimise imports by DPSUs under 'Atmanirbhar Bharat Abhiyan', Department of Defence Production (DDP), Ministry of Defence had notified three Positive indigenization Lists of LRUs/ Sub-systems/ Assemblies/ Sub assemblies/ Components in December 2021, March 2022, and August 2022 respectively with an indicative timeline for their indigenization. The 1st PIL contains 351 items, 2nd PIL has 107 items and 3rd PIL has 780 items for indigenization.

Subsequently, DDP has notified the revised timeline of the 72 indigenized items (PIL-1: 67 & PIL-2: 5). Now, these items will be procured only from the Indian Industry thereby giving a boost to the domestic industry including MSMEs and will save foreign exchange. This also reinforces the growing confidence of the Government in the capabilities of domestic industry for supplying items of international standards to meet the demand of the Armed Forces.

Anritsu Rubidium™ Signal Generators Honored by Military + Aerospace Electronics Innovators Award



Anritsu Company announces that its Rubidium signal generator family has been recognized among the best by the 2022 Military + Aerospace Electronics Innovators Awards. An esteemed and experienced panel of judges from the aerospace and defense community recognized Anritsu as a Platinum honoree. A Platinum

approach to meeting a need, and/or a new level of performance, efficiency, ease-of-use or other beneficial quality.

"On behalf of the Military + Aerospace Electronics Innovators Awards, I would like to congratulate Anritsu on their Platinum-level honoree status," said Military + Aerospace Electronics Editor-in-Chief John Keller. "This competitive

most innovative products impacting the aerospace and defense community this year."

The Rubidium signal generator family delivers outstanding signal purity and frequency stability, even at high output power levels, across a broad frequency range of 9 kHz to 43.5 GHz. Rubidium's low single sideband (SSB) phase noise of -136 dBc/Hz (typical) and -140 dBc/Hz (measured) at 10 GHz and 10 kHz offset is unmatched in the industry. Its best-in-class harmonic and spurious performance enables customers to make measurements with better accuracy.

Rubidium offers an order of magnitude with better frequency stability compared to other signal generators that use an OCXO-based reference. Coupled with built-in, easy-to-use, at-location frequency and power calibration capability, Rubidium offers exceptional overall utility and long-term value in a broad range of military/aerospace measurement applications, as well as commercial designs.

Military + Aerospace Electronics is the leading media resource serving program and project managers, engineering managers, and engineers involved in electronic and electro-optic design for military, space, and aviation applications.



award recognizes a superb innovation, characterized by a groundbreaking

program allows Military + Aerospace Electronics to celebrate and recognize the

The CAMCOPTER® S-100 – Proven Capability for the Indian Market



Neil Hunter,
Global Head of Business Development, Schiebel

Schiebel has been monitoring the Indian market for many years and has witnessed the extensive growth in UAS requirements – both military and commercial – that will benefit from the capabilities that rotary VTOL UAS would bring.

A good example of this is the requirement for autonomous tactical ship borne UAS by the Indian Navy, which is being steered under the Make in India mandate by the MoD. Our rotary solution is also ideal for the Indian Coast Guard for ISR as well as Search & Rescue. The current geo-political maneuvering in the Indian Ocean mandates robust tactical UAVs operating from ships as well as dedicated monitoring of island assets.

Further, the Indian Army is on the lookout for a robust logistics UAS for meeting the supply chain at high altitude terrain and

we are well suited for meeting this requirement with the S-100 for mid-level altitude and with S-300 (under development) for meeting all high altitude requirements. ISR for ground troops is another area where we are well positioned to participate under the “Make in India” mandate.

All three services have indicated that Manned-Unmanned Teaming (MUM-T) is going to be the future for air warfare both for the fixed wing and the rotary wing domain. The LOI-5 capability of the CAMCOPTER® S-100 positions it as one of the only MUM-T options for the new generation helicopters in the Indian Armed Forces, namely MH-60R, Apaches, LAH (Light Attack Helicopter) and ALH (Advanced Light Helicopter).

We are also developing a market in the oil and gas sector for India, bringing one of the most suitable solutions for upstream logistics the best solution as is being provided in Europe, Scandinavia and South America to name a few.

With the drone market in India opening up, Schiebel is working on potential tenders for tactical UAVs required for the paramilitary forces. The long range and endurance of the S-100 make it suitable for project monitoring, urban surveillance and coastal policing requirements.

The CAMCOPTER® S-100 system is proven to operate effectively and efficiently in extreme environments. Customers routinely employ the S-100 capability in arctic conditions down to -40°C and deserts up to +55°C, as well as in climatic zones of extreme humidity.

The VTOL UAS is runway-independent without the need for launch and recovery equipment. It is designed to operate up to 18,000 feet in ISA conditions and its endurance exceeds 6 hours with a full fuel load and 34 kg (75 lb) of payload. The optional external fuel tank further extends flight time to more than 10 hours. System deployment is possible from a small ISO container, static or mobile. The S-100 multi-sensor capability enables the monitoring of borders and provides many opportunities for local authority support.

The S-100 has a proven multi terrain capability with multiple sensors to address various kinds of operational profiles. Whether it is the tactical littoral operations or the surveillance in forest areas or terrorist engagement in urban environment or special ops, the





S-100 is capable of meeting all of these. The testimony is the fact that our product is being used by more than 35 customers on five continents and has been deployed in sensitive zones with resounding success.

Currently, Schiebel is being represented and supported by the well-established and successful Indian manufacturer VEM Technologies, which has developed a strategy to meet the 'Made in India' mandate.

To ensure we meet future customer needs, we are in the process of setting up a local office and company in India to focus on long-term business in the region. We want to support and grow with the Indian industry by creating jobs and developing technology and continuing to offer what we believe is the best Vertical Takeoff and Landing (VTOL) UAS available in the global market.

The S-100 is especially well-suited for Navies as it can be operated with either aviation gasoline or kerosene, also referred to as heavy fuel (including F-44/JP-5), making it ideally suited for the maritime environment. Its small footprint and the absence of launch or recovery equipment lets the S-100 be easily maneuvered, stowed and maintained in confined spaces or in ships' hangars. The variety of payloads for surveillance, monitoring and data gathering significantly expands the ship's overall tactical capabilities. Operation is possible from any ship with a small helicopter landing deck or suitable clear space, even in challenging weather and sea states.

Designed to be a multiple payload capability, the S-100 offers ultimate flexibility for a wide variety of payloads and missions to meet the diverse and individual requirements of customers. The S-100 can be equipped, for example, with a combination of a 360° radar, an EO/IR camera, IFF, COMINT, ELINT, COMM Relay, ADS-B and AIS, all of which can cross-cue to provide superior situational awareness.

The S-100 offers main, auxiliary, nose payload bays and side payload hard points as well as the ability to carry underslung loads.

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MoD signs Rs 1,700-cr deal for dual-role surface-to-surface BrahMos missiles

Induction of the dual-role capable missiles will significantly enhance the operational capability of Indian Navy fleet assets and the contract will provide further impetus to 'Aatmanirbharta' in defence production, said the Defence Ministry



India's Ministry of Defence (MoD) has signed a contract with BrahMos Aerospace Pvt. Ltd. (BAPL) for acquisition of additional dual-role capable surface-to-surface BrahMos missiles at an overall approximate cost of Rs 1,700 crore under 'Buy-Indian' category. Induction of these dual-role capable missiles will significantly enhance the operational capability of Indian Navy (IN) fleet assets and the contract will provide further impetus to 'Aatmanirbharta' (self-sufficiency) in defence

production.

BAPL is a joint venture (JV) between India and Russia and has been making crucial contributions to augment the new generation Surface-to-Surface Missiles (SSMs) with enhanced range and dual-role capability for land as well as anti-ship attacks.

The latest contract would be giving further boost to indigenous production of critical weapon systems and ammunition with active participation of indigenous industry, said MoD.

A combination of the names of Brahmaputra and Moskva rivers, BrahMos missiles are designed, developed and produced by BrahMos Aerospace, a joint venture company set up by Defence Research and Development Organisation (DRDO) and Mashinostroyeniya of Russia. The first test launch of the initial version of BrahMos took place in 2001. Various types of the BrahMos, including those which can be fired from land, warships and the Sukhoi-30 fighter jets, have already been

developed and successfully tested and inducted since then.

BrahMos is a two-stage missile with a solid propellant booster engine. Its first stage brings the missile to supersonic speed and then gets separated. The liquid ramjet or the second stage then takes the missile closer to three times the speed of sound in cruise phase. The missile has a very low radar signature, making it stealthy, and can achieve a variety of trajectories.

The 'fire and forget' type missile can achieve a cruising altitude of 15 km and a terminal altitude as low as 10 m to hit the target. The enhanced range version of the missile has a range of 4,000 km, as compared to the original range of 290 km.

In March 2022 India successfully test-fired the surface-to-surface missile at Andaman and Nicobar Islands. The extended-range missile was able to hit the target with pinpoint accuracy. The test was conducted in presence of Air Chief Marshal V R Chaudhari who also congratulated everyone involved for the successful test firing of the cruise missile. "Air Chief Marshal V R Chaudhari congratulated on the successful test-firing of surface-to-surface BrahMos supersonic cruise missile. He is in the Island territory of Andaman & Nicobar to review operational preparedness," Defence officials had said during the test.

Electric GSE for Military Aviation



Prahalad

Vice President - Aerospace & Defence
Maini Group

With the Government's thrust to work towards "Net Zero Emission" most airports are focussing to achieve 100% sustainable airports. Maini group is proud to be part of this Green Initiative in the aviation space.

Maini Materials Movement (P) Ltd (MMM), a Maini group company is the

forerunner in the field of harnessing electric technology for automotive & industrial applications for over three decades. MMM has designed and manufactured electrical Material Handling Equipments & in-campus passenger transportation buggies for various applications for sectors ranging from automobile manufacturing to pharmaceutical and food industry.

Over the last 6 years, MMM has designed & developed Electric tugs for Military & Civil aviation. These are truly "Made in India" product designed keeping in mind the Indian operating conditions.

Presently more than 200 electric tugs are in operation for both Defence & Civil applications.

We are proud to have our tugs operating on board INS Vikrant for towing of the fighter aircraft and helicopters. The tug is built to MIL specifications & robust to take care of the movements of the ship during the different sea state levels. Powerful and silent, the tug can tow 35 tons like a whizz.

As the tug is treated with special paint it can withstand extreme weather conditions at sea.



MAINI TOW TUG TOWING MIG 29K
ON-BOARD INS VIKRANT

The tug is also used for various other applications in aviation. The handling capacity ranges from 2000 kg to 35000 kg. The applications include aircraft tow, hauling of GSE, MRO, baggage tow at airports etc. Ergonomically designed & with minimum moving parts, the tugs are a boon for both operators and the maintenance teams.

With the support of the Government policies, the Maini Group is well equipped to customise products to the requirement of both Military & Civil aviation.



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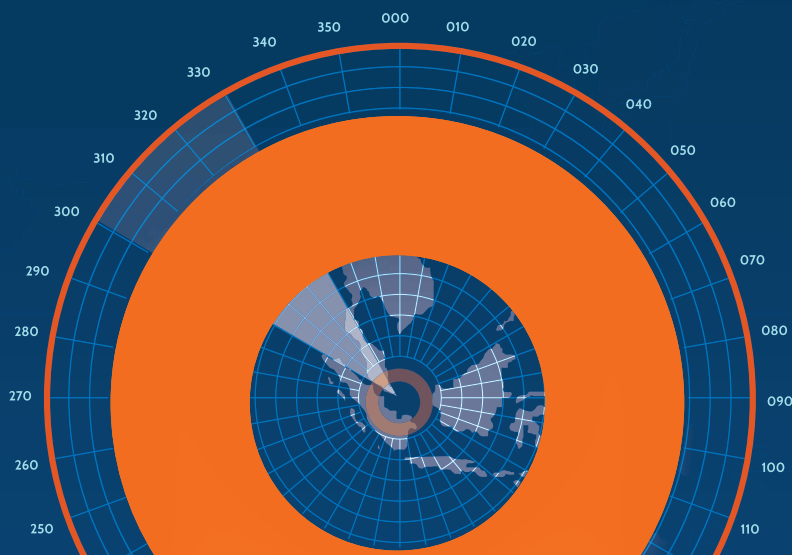


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Flight Tests of Very Short-Range Air Defence System by DRDO Successful



DRDO conducted two successful test flights of the Very Short-Range Air Defence System (VSHORADS) missile from a ground based portable launcher at the Integrated Test Range, Chandipur, off the coast of Odisha. VSHORADS is a Man Portable Air Defence System (MANPAD) designed and developed indigenously by DRDO's Research Centre Imarat (RCI), Hyderabad in collaboration with other DRDO laboratories and Indian Industry Partners.

VSHORADS missile incorporates many novel technologies including miniaturized Reaction Control System (RCS) and integrated avionics, which have been successfully proven during the tests. The missile, meant for neutralizing low altitude aerial threats at short ranges is propelled by a dual thrust solid motor. The design of the missile including launcher has been highly optimized to ensure easy portability. Both the flight tests have completely met the mission objectives.

Defence Minister Rajnath Singh appreciated the efforts of DRDO and industry partners and said that this new missile equipped with modern technologies will give further technological boost to the Armed Forces. Secretary DDR&D and Chairman DRDO congratulated the entire VSHORADS team for this tremendous success. ■



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Karnataka Marches Ahead with All-Inclusive Industrial Prosperity



Dr. Murugesh R Nirani
Minister of Large and Medium Industries
Government of Karnataka

The new Aerospace and Defense Policy 2022-27 of Karnataka that came into effect in August is aimed at attracting more investments and establishing the state as the preferred investment destination for aerospace and defense manufacturing. "The new Aerospace & Defense Policy will propel Karnataka's growth as a Defense Manufacturing hub by creating more than 70000 employment opportunity. The state government has succeeded in wooing the investors in a big way under the leadership of Chief Minister Basavaraj Bommai with the able cooperation of Large and Medium Industries Minister Dr. Murugesh R. Nirani. There are many achievements in various sectors validating the growth," said Murugesh Nirani, Minister of Large and Medium Industries, Government of Karnataka. In an interview with Aeromag, the minister talks about how the state government is driving the growth in various industrial sectors in Karnataka.

How do you assess the post-pandemic growth of the industrial sector in Karnataka when the government aims at a major increase in revenue?

Post-pandemic, Karnataka has emerged as a global investment destination with the highest inflow of 38% FDI and the state is leading in terms of proposed investment of registered Rs. 40620 crores. Karnataka led the pack in with a share of 37.55 percent of the total FDI inflow in FY22.

The state government has succeeded in wooing the investors in a big way under the leadership of Chief Minister Basavaraj Bommai with the able cooperation of Large and Medium Industries Minister Dr. Murugesh R. Nirani. There are many achievements in various sectors validating the growth.

Karnataka scored a major success in drawing investments to the state in the renewable energy sector. Gurugram-based ACME Cleantech Solutions Private Limited signed an MoU, in the presence of Chief Minister Basavaraj Bommai, to invest Rs 52,000 cr to establish a Hydrogen and Ammonia Plant with an associated Solar Power unit in Mangaluru. ReNew Power, a leading name in the renewable energy sector signed a Memorandum of Understanding (MoU) to invest Rs.50,000 cr. Petronas will invest Rs.31,200 cr to set up Green Hydrogen & Ammonia project, creating 3,000 employment opportunities.

The team led by Chief Minister Basavaraj Bommai has inked MoUs with major companies for a total investment flow to the tune of Rs.59,350 cr at Davos. The

ISMC announced an investment of Rs. 22,900 crores (\$3 billion) investment in a 65nm Analog Semiconductor Fabrication plant in Karnataka. A total of 642 investment proposals were approved for the period from October 2021 to June 2022. Rs.56752.99 crores worth investment have been attracted from these projects and employment opportunities will be available to 177488 people.

What are the key focus areas of the industries ministry in Karnataka? How do you propose to drive growth in those sectors?

Going by the interest expressed by the investors, sectors like manufacturing, aerospace & defense semiconductor, green & renewable energy, infrastructure



& IT-BT are the key focus areas of the government in Karnataka. In order to drive the growth in these sectors, new policies and initiatives have been taken by the government and the ministry. The government already has a new industrial policy which was released two years back. Recently, we released New Aerospace & Defence (A&D) policy and Employment Policy. A comprehensive semi-conductor policy is being prepared.

The Karnataka Industrial Areas Development Board (KIADB), the premier land allotting agency has come out with a work-to-work concept where a certain percentage of land is reserved for residential purposes in industrial areas. In the backdrop of the Karnataka industry department being a top achiever in 'Ease of Doing Business', the department has introduced the 'Ease of Land Allotment' system. Here, allotment of industrial land up to 10 acres need not come before the mandatory Land Audit Committee (LAC). This means, an application of an investor or industrialist wanting up to 10 acres of land will directly come before the State Level Single Window Clearance Committee headed by the Large & Medium Industries minister, skipping the LAC, which results in speedier approval of the industrial land process.

There is a provision for 10-year lease cum sale where the clear titles (sale deed) of the allotted land will be handed over to industries once those who are allotted the land successfully run the project just for a couple of years. Addressing the concerns of the industries and the reluctance of many investors to make investments in the state due to the existing policy, KIADB will allow all the lands to private industries/institutions on a 10-year lease-cum-sale basis.

Karnataka recently notified its new Aerospace & Defence Policy with the aim of attracting \$6 billion in investments and generating 60,000 jobs over five years. Could you talk more about the policy and whom the government will implement it?

The new Aerospace & Defence Policy will propel Karnataka as a Defence

Manufacturing hub. Aerospace & Defence policy (2022-27) aims to establish the state as the preferred investment destination for Aerospace & Defence manufacturing, create employment opportunities for more than 70,000 and develop the state as a manufacturing hub including MRO and space applications for the Indian market and exports. The state plans to develop 5 Aerospace & Defence hubs -- Bengaluru, Belagavi, Mysuru, Tumakuru & Chamarajanagara. The focus is also on setting up of Defence Testing Infrastructure (DTI).

To focus on the growth of tier 2 and 3 cities, Karnataka has launched programmes like 'Beyond Bengaluru'. What are the initiatives by the industries ministry with regard to boosting the sector in tier 2 and 3 cities?

With most of the industries concentrated in Bengaluru, the government is planning to expand them to tier two and tier three cities as well. Emphasis is on business expansion beyond Bangalore and local job creation. To attract investments of over 5 Lakh crore INR and create 20 lakh jobs in the state over the next five years, the state government has been laying considerable thrust to attract investment beyond Bangalore to lead to the holistic development of the state over the next five years.

The new industrial policy 2020-25 aims at all-inclusive development of the state and expansion of industries Beyond Bangalore in tier 2 and 3 cities. Districts of the state are divided into three zones to provide subsidies for investments. Zone-1 and 2 include backward districts in industrial development. Bangalore city and rural districts are classified in Zone 3

Under One district, one product, a toy cluster at Koppal, an FMCG cluster at Hubballi Dharwad, a pharma cluster at Yadgiri district, a textile and jewellery park at Kalaburgi, and an IT park at Hubballi-Dharwad have been planned. With the establishment of industries in North Karnataka, thousands of job opportunities will be created and the rate of migration of young people from this part to other cities in search of employment will be reduced.

Karnataka has extended an open invitation to domestic and foreign toy manufacturers to invest in Koppal, the country's first toy cluster. In addition to Prime Minister Modi's call of 'Vocal for Local' under the 'Atmanirbhar Bharat' campaign, Karnataka has emphasized toy manufacturing and promised to provide

necessary facilities to domestic and foreign toy manufacturers.

A textile hub will be set up at Kalaburgi. Cotton is mostly grown in the Kalyan Karnataka region including Raichur and Bellary. Belagavi has a Special Economic Zone Centre for Aerospace Precision Engineering and Manufacturing. 'Foundry Cluster', and 'Mission Tool Park' will be started in Belgaum. The infrastructure is here to support the establishment of these industries. In addition, the government is also committed to providing necessary facilities.

Several industrial areas like Tumkur Machine Tools Park, Food Park, and Japanese Industrial Area have been developed and major industries have started their factories. Karnataka's largest industrial township will be built at Kolar Gold Fields (KGF) in Kolar district by the state government Bharat Gold Mines Ltd. (BGML), the drone survey is being conducted on 3,212 acres of land.

Steps have been taken to set up separate Women Enterprise Parks in Harohalli and Kalburgi. The establishment of Women Enterprise Park in 42.57 acres area in Bidar has been approved and financial sanction has been received.

How do you assess Karnataka's investor-friendliness and Ease of Doing Business (EODB)? What are the ministry's plans with regard to boosting them?

Karnataka has bagged the 'Top Achiever' position in the Ease of Doing Business ranking of states/union territories released by the Department for Promotion of Industry and Internal Trade (DPIIT), Government of India. This is the state's best performance under EoDB since the inception of this assessment. Karnataka improved its position from 17th position to the 'Top Achiever' along with Andhra Pradesh, Gujarat, Haryana, Punjab, Tamil Nadu, and Telangana.

Multiple ease of doing business measures have been introduced to make sure Karnataka is leading industrial development in the country. Affidavit Based Clearance (ABC) scheme was introduced to ease processes and to facilitate and attract investment. ABC scheme simplifies regulations and reduces procedural requirements and creates a conducive investment environment. We also have a Central Inspection System to develop a dedicated, integrated inspection services system to aggregate clearances from over 15 departments. Reducing compliance burden by simplifying 323 laws

and integrated online application services for all investors is another highlight.

There is Single Window Portal - Through e-Udyami, the Single Window Portal of Karnataka, the approvals/clearances; including renewals, can be sought from various departments. Industry-related services have been bought under the purview of the SAKALA Act or time-bound rendition of services. Investors can opt for an online approval wizard to get a list of all pre-establishment, pre-construction, during-construction, post-construction, and post-operation clearances/approvals specific to the desired business.

Karnataka Udyog Mitra, the nodal agency for ensuring the implementation of EODB reforms in the state, has taken immense efforts in ensuring the timely and effective implementation of recommendations made by DPIIT, GoI. This has been achieved in due coordination and efforts by 30+ state departments that implemented reforms across 15 reform areas.

Could you talk about the state's initiatives to support startups and MSMEs, which have a major role to play in Aatmanirbhar Bharat?

I am proud that Karnataka has been adjudged one of the best performers in the central government's Start-up Ranking-2021 for developing a strong start-up ecosystem through holistic and inclusive policies, sector-focused incentives of the government, and supporting innovation across sectors. A deep technical pool, well-established private and public technology institutions, and proactive government policies have made Bengaluru a vibrant destination for all start-ups.

Bengaluru has a balanced ecosystem of IT and IT-enabled services, electronics, biotechnology, and innovation housing more than 13,000 start-ups and 58 incubation centres. A total of 10 start-ups have entered the prestigious \$1 billion valuation club as of April. Our start-up ecosystem seems to be booming if one looks at the number of start-ups that have turned unicorns this year. Our government under the leadership of our Chief Minister Basavaraj Bommai, is striving to encourage start-ups by creating substantial opportunities for innovation and creativity.

In this regard, our government and the Department of Industries and Commerce are here to guide start-ups through all the necessary information on the various schemes, incentives, developmental

programs, loans, and resources that are available for the benefit of the young aspirants. Through the creation of the Start-up Vision Group-Karnataka under the Start-up Karnataka program, we have aimed to bring together the brightest minds to help set up a robust framework for policy generation.

With the support of credible financial support and good policies, the start-up



ecosystem in Bengaluru will continue to march ahead, breaking new ground and creating new innovations.

Now, Micro and Small Enterprises can avail of an investment promotion subsidy to the extent of 10% of the turnover in the financial year and spread the same to a maximum of five financial years from their date of commercial production. To keep the momentum of growth and encourage the holistic development of MSMEs in the Aerospace and Defense sector of the state govt will provide the following incentives and concessions.

The government of Karnataka has signed a Memorandum of Understanding (MoU) with global e-commerce giant Amazon India to help drive e-commerce exports from the state. As part of the MoU, Amazon will train and onboard MSMEs from the state on Amazon Global Selling, its Exports Program, enabling them to sell their unique Made in India products globally to millions of Amazon customers across 200+ countries and territories.

Under the leadership of Prime Minister Narendra Modi, several measures were announced as part of the Aatmanirbhar Bharat package to help MSMEs survive the unfolding pandemic infusing liquidity laying the foundation of a more robust MSME sector for the long-term.

Karnataka government has taken a slew of policy measures to aid the growth of MSME in the state. The recently passed Industrial Facilitation Act builds an MSME-friendly investment climate in the State aiding the ease of doing business in the state. The amended act enables MSMEs to start operations without obtaining approvals from different departments like

trade licenses, building plan approvals, etc. Self-certification related provisions in the approval process for new investments have also been introduced.

What are Karnataka's plans for the Electric Vehicle industry, which forecasts huge growth in the years ahead?

Karnataka is a preferred investment destination for manufacturing Electric Vehicles (EVs), and Bengaluru – is the Electrical Vehicle capital of India. We are the first state in India to launch an exclusive EV Policy offering best-in-class benefits for investors like Production Linked Subsidy of 1% on Turnover for 5 years, 15% capital subsidy on fixed assets, and zero registration charges for electric vehicles.

The progressive EV policy and tax benefits offered by the state has been well appreciated by stakeholders and resulted in contributing to a thriving Electric Vehicles Manufacturing and Supplier ecosystem. This will be further strengthened with a dedicated EV Cluster being set up in Ramanagara. A first-of-its-kind common EV testing facility is being set up in Karnataka. The Common EV Testing-cum-Certification facility shall aid in the development, system integration, calibration, evaluation, and certification of EV components, powertrain, and energy storage.

With more and more people now open to opting for electric vehicles, the EV market size is expected to grow significantly in Karnataka over the next few years. Substantial subsidies and tax benefits have been planned by the government to encourage EV adoption. With these reforms and unique initiatives, we are aiming at transforming the state into an EV hub.

How does the government support industry-academia interaction with the aim of skill development?

To support industry-academia interaction with the aim of skill development, we have initiated a unique program 'Udyami aagu, Udyoga Needu' across the state - which is an effort from us to encourage youth persuading their academics, and budding entrepreneurs to start their own enterprises as well as provide employment opportunities to others. Instead of searching for jobs, young people should be able to create employment and provide employment to others. The department is taking strong measures to support the economic activities of the entrepreneurs.



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Thank you, Stakeholders. We owe it to you.



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