

Air Power: Resolute in Blue Glory

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Interview with
Air Chief Marshal Rakesh Kumar Singh Bhadauria
PVSM AVSM VM ADC

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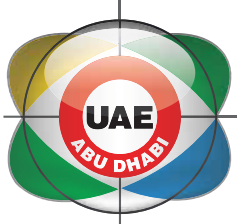


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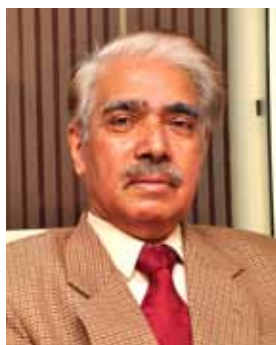
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EDITORIAL



MoD's new Acquisition Procedure: Indian industry on verge of big growth

The Ministry of Defence (MoD), Government of India has recently released the 'Defence Acquisition Procedure-2020' (DAP), which was earlier referred to as Defence Procurement Procedure (DPP). DAP includes several landmark proposals to ensure timely acquisitions of military equipment, systems and platforms required by the nation's armed forces. According to Defence Minister Rajnath Singh, the DAP "derives its ethos and spirit from the clarion call of an 'Atmanirbhar Bharat' and 'Make in India' which define India's growth story and the dream to become a USD 5 trillion economy by 2024."

No wonder, the efforts to achieve the goals of DAP would have a major impact on Indian industry, including the public and private sector firms. For instance, the procedure elaborates on plans for procurement of defence equipments designed and developed by the Ordnance Factories, Defence Public Sector Undertakings and the Defence Research & Development Organisation. DAP suggests a joint mechanism for better coordination between the development agency and the user service to propel development projects.

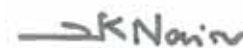
Significantly the DAP has excluded from Offset credit, orders by foreign OEMs on Indian companies for manufacture of components, structures and equipments and the like required for commercial / civil aircraft. This will have a major negative impact on future orders from civil aircraft and engine manufacturers and their Tier-I suppliers, resulting in considerable loss on potential export orders and associated gains in technology and growth of the Indian aerospace industries and benefit from that even for enhancing their capability to undertake such work for military aircrafts, as these technologies and capabilities are of dual use (civil and military).

Offset clause is also excluded for orders on the basis of inter-governmental agreements. However this is expected to be adequately compensated by insisting on manufacture in India and 'Make in India' or 'Buy and Make in India' process resulting in enhanced indigenous manufacture and employment. Higher multiplication factor (x 2) has been provided for transfer of technology as well as for export orders placed on SMEs. The latter is expected to stimulate more orders for SMEs and greater co-operation between components and equipments - Tier-I and Tier-II manufacturers of foreign OEMs with Indian SMEs.

DAP also deals with the acquisition of Information and Communication Technology systems and products for military purposes. This acquisition programme is similar to that of hardware, involving a multi-stage process. However, the DAP document also considers issues such as information security, proof of concept and change management.

The document deals with the leasing of platforms too. Another crucial topic dealt with is the 'Simplified Capital Expenditure Procedure' (SCEP) for recurring replenishment, repair and refit of in-service equipment/systems. It is pointed out that private industries in India would have a major role to play in this regard. In addition, the latest version of DPP considers post-contract management.

Moreover, new procurement categories like 'Buy (Global - Manufacture in India)' have been introduced. The document also links lifecycle support with the main procurement contract, brings about changes in the standard clauses of contract, stresses on MoD's rights to indigenize and revamps the offset policy. The Ministry of Defence has announced the Aero India 2021 and a good number of companies have already booked the stalls. As an international event, this is a great opportunity to showcase the capabilities of the Indian industry to the global market. The ministry has made it clear that Covid -19 protocol should be followed for the safety of the exhibitors and visitors. We wish all success for Aero India 2021 and also hope that it will help the industry to get more business and opportunity for global partnership



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India, US sign 'BECA' during 2+2 meet

Defence and Foreign Ministers of India and Secretary of State and Defence Secretary of the US took part in the Dialogue which also discussed Defence Industrial Cooperation, Defence Innovation and the situation in Indo-Pacific, among a host of other issues of mutual interest.



Prime Minister Narendra Modi, Defence Minister Rajnath Singh, External Affairs Minister S Jaishankar, US Secretary of State Mike Pompeo, Defence Secretary Mark T Esper, National Security Advisor Ajit Doval and US ambassador to India, Kenneth Ian Jaster.

India and the United States were recently engaged in the '2+2 Ministerial Dialogue' in New Delhi. While Defence Minister Rajnath Singh and External Affairs Minister S Jaishankar led the talks from the Indian side, Secretary of State Mike Pompeo and Defence Secretary Mark T Esper represented the US.

Following the meeting, Rajnath Singh thanked the US Secretaries, their delegations and members of the US media for having travelled to India amidst the threat of COVID-19 pandemic. "I deeply appreciate your commitment to our bilateral relations," he said.

According to Rajnath Singh, comprehensive discussions on key aspects of bilateral and multilateral cooperation were held. "We considered the major challenges we face. The need for quick economic recovery and growth, prevention of the pandemic, rebuilding the global supply chains and related issues received obvious priority in our discussions," he elaborated.

The Defence Minister said that signing of the Basic Exchange and Cooperation Agreement for Geo-spatial Cooperation (BECA) during the latest 2+2 meeting was a significant achievement. During the earlier editions of the dialogue, LEMOA was signed in 2016 and COMCASA in 2018.

Other highlights

He also highlighted some

of the other noteworthy steps taken by India and the US. "These include positioning a USN LO at IFC-IOR and Indian LO at NAVCENT, Bahrain; greater interaction and coordination with CENTCOM and AFRICOM; setting up of the COMSEC account and increasing the scope and complexities of our exercises. Now LO's at each other's establishments could be leveraged to enhance our information sharing architecture. To sum it up, our military-to-military cooperation is progressing well," Rajnath Singh pointed out.

Probable capacity building and other joint cooperation activities in third countries, including the neighbourhood and beyond, were also explored during the meeting. "We have convergence of views on a number

of such proposals and will take those forward," he stressed.

The Defence Minister welcomed the acceptance of India's request for cooperation in the advanced field of maritime domain awareness. "Both sides agreed to comprehend the requirements and initiate processes for joint development of requisite systems and expertise," he said.

Defence Industrial Ties

India and the US also had a very candid and useful discussion in the area of Defence Industrial Cooperation. "The recent initiative of 'Atmanirbhar Bharat' in Defence sector was underlined as a key driver and a guiding factor of our Defence Industrial Cooperation. highlighted the capabilities of Indian Defence Industry and their

usefulness in the supply chain of major US platforms and systems. We have identified priority Near-Term projects for joint development between respective agencies, which need to be fast-tracked under the DTTI and resolved to work together in Defence R&D more efficiently," said Rajnath Singh. Moreover, the Minister pointed out that the Defence Innovation field has been growing consistently in the discussions in recent years. "The instruments of ISA and iDEX/DIU MOI, which were agreed upon and signed during our last 2+2 meetings, are beginning to bear fruit. We welcomed holding of the inaugural meeting of

iDEX-DIU in July 2020 through Video Conferencing and are looking forward to the first ISA Summit this year, he said.

Indo-Pacific Situation

India and the US also made an assessment of the security situation

across the Indo-Pacific. "In that process, we reaffirmed our commitment to peace, stability and prosperity of all countries in this region. We also agreed that upholding the rules-based international order, respecting the rule of law and freedom

of navigation in the international seas and upholding the territorial integrity and sovereignty of all states are essential. Our defence cooperation is intended to further these objectives. Both sides welcomed Australia.



Defence Minister Rajnath Singh, External Affairs Minister S Jaishankar, US Secretary of State Mike Pompeo and US Defence Secretary Mark T Esper.

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Air Power: Resolute in Blue Glory

Chief of the Air Staff Air Chief Marshal Rakesh Kumar Singh Bhadauria PVSM AVSM VM ADC tells Aeromag Asia how the Indian Air Force has comprehensively scaled up its combat capability in response to the evolving threat matrix in the region, to fight across domains over the entire spectrum of warfare. A special salute to the Force on its 88th Foundation Day.



Aeromag Asia: Air Chief Marshal Bhadauria, what was your resolve as you paid your tribute to the indomitable valour and sacrifice of the nation's warriors on the Kargil Vijay Diwas, in the backdrop of the evolving threat matrix in the region and security challenges in the high-altitude forward bases in eastern Ladakh?

Chief of the Air Staff: Kargil Vijay Diwas is a befitting tribute to the indomitable spirit of the Indian soldiers who surmounted all odds in the line of duty, protecting the Nation at all costs. The IAF was provided a unique opportunity in 1999 as it was called into operations in support of our ground forces. We innovated to arrive at weapon solutions and formulated tactics that allowed aircraft operations at high altitude. It was also the first time that our fighters dropped Laser Guided Bombs in an operational environment. LGBs and GPS aided bombing were extremely successful and pivotal in evicting the intruders from their dug in positions. The experience of Kargil operations has held us in good stead with consolidation of capabilities in later years that can today be brought to bear for operations in high altitude terrain. Our resolve is to modernise and build our capability to attain and maintain a combat and technological edge over our adversaries.

As the CAS who has flown the Rafale jet among a varied array of 26 different

types of fighter aircraft and commanded the Jaguar Squadron as well as the Flight Test Squadron at the Aircraft & Systems Testing Establishment, what's uppermost in your mind when you speak of enhancing our operational capability?

Our strategic priority is to ensure that we operate home grown systems backed by an industrial ecosystem with expertise in cutting edge technology. Advantage over our adversaries in the long run is possible only if such capability is driven domestically. Training and Infrastructure are also critical capability enhancers that need constant focus. If I look at the near future, the domain of Space is gaining

increased significance. While we are currently putting in action plans to induct more ground and air borne sensors and combat aircraft, development of space



Air Chief Marshal Rakesh Kumar Singh Bhadauria
PVSM AVSM VM ADC



based assets, information superiority and capabilities in this domain will also be a focus area for the IAF.

You speak of the potent combination of the Su-30 MKI and the Rafale operating together, while embracing emerging fifth generation technologies and strategic capabilities. How daunting is the challenge of integrating and operating existing assets, contemporary combat jets, mission critical systems and advanced platforms?

The IAF has many decades of experience in operating systems with different countries of origin, in addition to those designed within the country. We have adapted technologies and evolved practices to meet our requirements. Most importantly, IAF's Integrated Air Command and Control System (IACCS) is fully operational and is already in the process of integrating the airborne data link with the IACCS. This network centric operations capability allows us to effectively employ our combat assets.

Our procedures cater to integration for concerted operations. Latest inductions like the Rafale and LCA Mk 1 Tejas aircraft, LRSAM, Arudhra and Aslesha radars, SDR etc will be integrated in an optimal way to meet our induction / acceptance standards, training schedules and op employment procedures.

In the midst of the unrelenting devastation and economic fallout of the COVID-19 pandemic, how optimistic are you about smart budgeting with regard to procurement of frontline fighter jets and missile systems, mid-life upgrade of legacy aircraft and funding indigenous projects in aerospace?

We have re-prioritised our critical requirements in procurements and upgrades of aircraft and weapons to meet Op tasks over this decade.

A priority list and smart budgeting will help meet the assigned tasks. IAF has already put in place several measures that would control our revenue expenditures

without affecting our operational capability. It should be appreciated that the cash outflow for major capital projects gets extended over a long period and as such, we hope that the current crisis is contained and we will embark on a path of quick economic recovery.

What is the scope of Indian Air Force involvement in the Atmanirbhar Bharat Abhiyan interface between the private sector and public sector Defence establishments, especially with regard to LCA MkII and AMCA, TejasMk 1 and MkIA?

The role of the IAF has been integral to the Tejas programme. We have been in constant interface with Defence research institutes and PSUs with regard to our requirements and specifications that led to its development.

IAF has been strongly advocating an increased role of private sector in aerospace manufacturing. The big projects like LCA variants and AMCA



will certainly involve the Public and Private sector in equal measure. In fact, the private sector will have increasingly greater role in design and development of defence systems / sub-systems and in some cases, to even be the lead integrator of major platforms and combat systems. The new DAP 2020 promotes Development cum Production Partner or DPPP model for defence projects and IAF fully supports it. In addition to the big capital acquisition projects, IAF is already progressing a large number of projects under Make-II, Technology Development Fund (TDF) and iDEX schemes. Equally important are IAFs' own efforts to indigenise a very large number of spares and consumables for our existing aircraft and systems. Most of these indigenisation efforts are with the private sector.

Now that you have presided over the formation of the second Tejas Squadron, the Flying Bullets, last May, in the initial Covid lockdown period, and the Rafale jet has been inducted into the IAF, are new contingencies going to affect your induction schedules and squadron strength?

First five Rafales have been inducted into IAF on August 20. Induction of balance Rafale is on schedule. We expect more number of LCA aircraft to start inducting at Sullur soon. I am confident that HAL armed with the experience of having operated in a pandemic, will

be able to ramp up its production rate and ensure timely deliveries of balance aircraft. Induction of 83 LCA MK 1A will commence in three to four years and we are hopeful that HAL will ensure accelerated delivery of these aircraft.

In the next three to four years period we will see the Rafale and LCA Mk1 squadrons operating in full strength, along with the additional Su-30 MKI and Mig-29 aircraft procured to add to the current fleet strength. The induction of the 83 LCA Mk1A will commence soon thereafter and we expect that the full complement of 83 aircraft should get delivered at a faster rate.

Finally, is the Mission Gaganyaan training programme that IAF has been overseeing on track? Could you give us an update?

The IAF pilots selected for the Gaganyaan programme have been undergoing training under the aegis of ISRO in Russia. The programme is well coordinated and orchestrated as part of national effort. The IAF pilots are in good health and good progress has been made in their training. I am sure Gaganyaan Programme will be a great success and the nation shall witness Indian Gagannauts in Space inside Indian Space Capsule launched by Indian rockets.



IAF 'Looks East'

The Quest for Air Supremacy along the Himalayas



"Air power will be a crucial enabler for our victory in any future conflict. It is imperative that the IAF obtains and maintains technological edge over our adversaries." These words by the Indian Air Force chief Air Chief Marshal (ACM) RKS Bhadauria during a talk the Centre for Air Power Studies in September has highest ever relevance considering the Indo-China standoff. The recent induction of several platforms including the Rafales, C-17s, Chinooks and Apaches had provided the IAF with substantial tactical and strategic capability enhancement along the Indo-China border which has been witnessing heightened military situation over the few months. IAF has been showing off its night-flying capability in Ladakh, with fighter jets like the MiG-29 and the Sukhoi-30 carrying out round-the-clock flying.

However, even as the government asserts that IAF is fully prepared for a two-front war, the concerns of the ageing assets of IAF against the almost double-sized air fleet of China are real. Because if the 'Dragon beyond the Himalayas' decides to breath out fire over the ice-capped mountains, India's air superiority will undoubtedly be put to the toughest test ever. Here, Aeromag analyses the capabilities of Indian Air Force (IAF) and the immediate importance of adding to its airpower through faster indigenization in the background of prevailing standoff between India and China along the border.



The superiority in air power is the most prime factor in deciding the outcome of a modern conventional war. If a country loses the war in the air, it will lose the war and it will lose quickly. Supreme air power has always created superpowers in history. Though the methods might have changed over time, the need for air supremacy never goes away.

In the case of India, now is the time to validate its aerial supremacy especially along the Himalayas, where the Chinese are increasing their presence on land and air due to the Sino-Indian border dispute. The Indian Air Force (IAF) is the fourth biggest air force in the world with proven combat power of man and machine. However, with China's People's Liberation Army Air Force (PLAAF) having created an air fleet that is nearly double the size of the IAF's ageing

fleet, the situation demands India to recheck the size and operational readiness of IAF assets. Hence India needs to build its deterrence capability by modernizing and expanding the IAF—enough for China to see the futility of forcing a military solution to the Sino-Indian border dispute.

IAF's 'Look East' plans

Over the last one year the standoff between the two countries along the Line of Actual Control (LAC) has been the worst ever since the Indo-China War in 1962. China was hardly in a position to use its air power to influence the ground battle in 1962 and the IAF had upper hand as China's offensive air capabilities in the Tibetan region were practically nonexistent. But that was more than half a century ago and now if China initiates another military conflict along LAC, it can and will make

full use of its air power in a bid to force the outcome in its favour once again.

India is anticipating China's aerial attempts and has rightly asked IAF to 'Look East' keenly unlike the past when the focus was mainly on the western adversary. Till very recently, there were no Surface-to Air Missile (SAM) units or credible radar units east of the 82 degree longitude in the Indian side. The entire eastern command of the IAF has based its war plans on the mobility of Air Defence assets, which were to be brought from the western sector during hostilities. The effectiveness of this plan was never put to test in totality. But now it is altogether a different story and the IAF is on highest-ever alert with most of its sophisticated assets and weapons, including the newly inducted Rafales, having deployed in the region.

Besides, combat power, IAF with a key role in providing support to the troops to LAC as India is strengthening its presence in the region.

How strong is the IAF?

The IAF is a modern, technology-intensive force that has kept pace with the demands of contemporary advancements to be counted amongst the foremost powerful air forces in the world. But considering the present military developments in the region the question would be how strong IAF is compared to China's People's Liberation Army Air Force (PLAAF). The answer is that the PLAAF has a quantitative edge but IAF will be more than able to hold its own.

The PLAAF is stronger compared with the IAF in terms of fleet and strategic inventory, but the IAF deploys more reliable platforms and strategic bases, combined with

experienced troops. PLAAF is the second biggest air force in the world whereas IAF is the fourth largest. PLAAF has an inventory of more than 2,000 combat aircraft, which is more than double the IAF's 900 combat aircraft. PLAAF has a long-range strategic bomber fleet and holds more strategic assets such as airborne warning and control system (AWACS) aircraft and combat drones compared with the IAF.

But when it comes to effectiveness and combat-readiness of men, IAF pilots possess more hands-on-experience in high-altitude combat missions that PLAAF's and the strategic location of bases near the LAC ensures uninterrupted support for India's aerial assets. Moreover, the combat-proven aerial platforms such as AH-64E Apache and CH-47F Chinook are reliable during

conflicts and the modern fleet of transport aircraft enables rapid transfer of equipment and supplies to the areas of operation.

Fighter Fleet

The PLAAF has around 600 fourth-generation fighters including J-10B/C, J-11B, J-16, and Su-30. It has also started building fifth-generation fighters such as J-20 and FC-31/J-31. Although the PLAAF has started inducting J-20, which has stealth features, it is said to be not superior to IAF Rafale, a 4.5-generation aircraft inducted recently.

Like the IAF chief said the induction of five Rafale fighters will enable the IAF to maintain air superiority over China's J10, J11, and Su-27 fighter jets. Rafale is armed with Meteor very long-range and MICA beyond visual range (BVR) air-to-air missiles,

which could give superiority over Chinese aerial assets. India is set to get another 31 Rafales in the coming years.

The Rafale can fly at speeds of 1.8 mach (2,222.6km per hour) and it has a range of 3,700 km. It has multi-directional radar which can detect 40 targets at the same time in a range of over 100 kms. It has Spectra, an integrated defence aid system which can jam or counter-jam enemy radar signals. The aircraft has cannon that can fire 2,500 rounds per minute.

Rafale will have the ability to take off from high altitude airbases like Leh on a 'cold start' - for quick reaction deployment. Rafale is going to boost the IAF's capabilities as it comes loaded with 13 India specific enhancements.

IAF's prime most air superiority fighter is the Russian made Sukhoi Su-

30MKI which can perform air-to-ground strike missions. There are more than 270 Su-30MKIs in the IAF and they form the backbone of IAF fighter fleet. Moreover the twin-seater, twin-engine multirole combat aircraft can fire the supersonic missile BrahMos. BrahMos-armed Sukhoi-30 MKI, which need not have to cross the border anymore to destroy enemy's deep assets, is a lethal weapon of IAF.

The Sukhoi Su-30MKI has 2500 km/hr (Mach 2.35) and has a maximum takeoff weight of 38,800 kg. The Su-30 MKI aircraft is capable of being refuelled by an Air to Air refuelling aircraft or by another Su-30 MKI aircraft carrying a buddy refuelling strap on pod. Su-30MKI multi-role fighter-bomber is one of the best 4 generation aircraft currently available.





So, the combination of Rafale and Su-30 MKI along with the BrahMos will be a gamechanger as these fighter jets will extensively enhance the attacking capabilities of the IAF. IAF is also fielding HAL Tejas fourth-generation multi-role light fighters to replace its ageing MiG-21 interceptor aircraft.

IAF also has more than 50 French multi-role aircraft Mirage 2000 and 106 strike aircraft Jaguar in service. The Russian made Air Superiority aircraft MiG 29, ground attack aircraft MiG 27 and Interceptor/ Multi-role aircraft MiG 21 are also there in the fleet.

Lack of strategic bomber fleet

The PLAAF has a dedicated bomber force that comprises the H-6 Badger, which is a long-range aircraft that can carry six land-attack cruise missiles (LACMs). It could provide the PLAAF with a long-range, precision-strike capability to target any part of India. But the IAF has no strategic bomber fleet and there are limited options to deploy its AN-32 transport aircraft and multi-role fighters in bombing missions.

Early warning aircraft

The PLAAF has around 20 AWACS and airborne early warning and control (AEW&C) aircraft compared to five aircraft of IAF. The KJ-2000 Mainring (based on Ilyushin Il-76), KJ-200 Moth (Shaanxi Y-8), and KJ-500 (Shaanxi Y-9) are China's

force multipliers amplifying the capabilities to detect, track, and target threats. The IAF currently operates indigenously developed DRDO AEW&C system, which is based on the Embraer ERJ 145 aircraft, and the EL/W-2090 Phalcon AEW&C installed on the Beriev A-50 platform.

IAF has edge Transport aircraft fleet

IAF has the state-of-the-art strategic air lifters, including the C-17 and C-130J, to ensure rapid transfer of equipment and supplies to airbases near the LAC, which is the need of the hour for ground forces on the battlefield. The C-17 Globemaster III, C-130J-30, Ilyushin Il-76, Antonov An-32, and Dornier Do 228 aircraft form part of the IAF's transport aircraft inventory. The PLAAF's comparatively smaller fleet of strategic airlift assets includes Y-20 large transport aircraft and Russian-made Il-76 aircraft.

Advanced rotorcraft fleet

India is a strong contender to China with its advanced helicopter fleet. The IAF's CH-47F Chinook, Mil Mi-26, Mil Mi-8, Mil Mi-17, Mi-17 1V, and Mi-17V 5 are intended for heavy and medium-lift strategic and utility roles while HAL Light Combat Helicopters (LCH) and HAL Rudra attack helicopters are dedicated for combat missions.

The recently inducted Boeing AH-64E Apache attack helicopters will enable the IAF to perform day/night, all-weather attack missions

especially in rugged mountain regions of Indo-China borders. The PLAAF operates the WZ-10 attack helicopters, Mil Mi-8, and Harbin Z-9 utility helicopters, and Changhe Z-8 transport/utility helicopters.

UAVs and SAMs

The IAF has a smaller UAV fleet compared to PLAAF's that includes IAI Searcher II and IAI Heron for reconnaissance and surveillance missions. The PLAAF operates Yunying (CloudShadow) armed reconnaissance unmanned aerial vehicles (UAVs), Gongji 1 armed intelligence, surveillance and reconnaissance (ISR) UAVs, CH-4 and CH-5, and Yilong (Wing Loong) series of unmanned aircraft, which can carry two or more air-to-surface guided munitions. A UAV fleet has the advantage in conducting sorties and strikes near the borders with no risk of damage to their manned aircraft and crew.

Surface-to-air missiles

The PLAAF has SA-20

battalions imported from Russia and indigenously-produced CSA-9 (HQ-9) battalions, making it one of the world's largest inventories of advanced long-range surface-to-air missile (SAM) systems. With the S-400 Triumf SAM system in its arsenal, the PLAAF can intercept incoming aerial targets at a range of 400km, ensuring superior air defence capabilities against India.

The IAF's SAM inventory includes S-125 Pechora, 9K33 Osa-AK, 9K38 Igla-1, Akash, and SPYDER missile defence systems. Though India has ordered the S-400 Triumf SAM system the delivery is yet to be made.

Need for Fleet Addition/ Upgrade and its Challenges

The numbers of IAF fighter squadrons had dropped to 29 from a sanctioned strength of 42. Soon this will decrease even further to around 25 squadrons, as 4-5 squadrons of its 100-odd legacy MiG-21 'BIS' ground-attack fighters will retire. The IAF chief





Bhadoria has conceded that the IAF would be unable to meet its goal of operating 42 combat squadrons by 2030, but would manage 36-38 squadrons by then.

But the funds, technological input and industrial capability needed for these additional assets will be a challenge

for India considering the budgetary constraints due to the COVID-19 pandemic. The additional 320-odd fighter types would cost upwards of \$ 45 billion, or around 68%, of the annual defence budget of \$65.9 billion for the fiscal year 2020-21.

India ordered 36 Rafale

jets from France in a deal worth Rs 59,000 crore in September 2016 and only five were delivered.

IAF Indigenisation

IAF is looking at close to 450 'Make in India' aircraft of various types in the next 10-15 years. IAF would

sign a deal with HAL for an additional 83 upgraded Tejas M1A fighters. To bridge the shortfall of fighters, till the indigenously Advanced Medium Combat Aircraft (AMCA) joins the fleet 2029 onwards, the focus will be on procurement of 114 Multi-role Fighter Aircraft (MRFA).

Bhadoria said that it is the best time for 'indigenous production' of these aircraft since industries were responding and coming up with solutions to the challenge of delivering them. He also talked about the possibility of a Joint Venture (JV) in developing fighter jet aero-engine in India that will potentially set forth a new era of aerospace in India.



DRDO engages in back-to-back missile tests



Dr G Satheesh Reddy
Chairman, DRDO

“DRDO Chairman Dr G Satheesh Reddy has said that the rapid test-firing will enable India to achieve self-reliance in the field of missile systems. The country can produce whatever system or equipment required by the armed forces here itself, he said. Shaurya hypersonic missile, BrahMos extended-range missile, Prithvi nuclear-capable ballistic missile, Hypersonic missile technology development vehicle, Rudram-1 anti-radiation missile and the Supersonic Missile Assisted Release Torpedo weapon system were among the tests carried out.”

India's Defence Research and Development Organisation (DRDO) has been carrying out a series of tests at short intervals recently. In fact, the premier defence research agency has conducted one test firing of a missile every three days since early September 2020. The missiles include a wide variety, ranging from the nuclear-capable Shaurya—a ground-launched variant of the submarine-launched B-05 ballistic missile—the air-launched Anti-Radiation Missile 'Rudram' and tactical missiles like laser-guided Anti-Tank Guided Missile.

Among first in this series was the successful test of the Hypersonic Technology Demonstration Vehicle, which is a scramjet-powered cruise vehicle which achieved a velocity of nearly 2 km per second. The vehicle is envisaged as a test platform for a future range of

hypersonic cruise missiles. Soon, DRDO test-fired the Supersonic Missile Assisted Release of Torpedo (SMART), which is a high-speed missile delivering a lightweight torpedo to attack enemy submarines over 600 km away.

Yet another test involved the indigenously designed and developed cruise missile Nirbhay which has a range of 1,000 km. Test-fired from

the integrated test range on A P J Abdul Kalam island off Orissa coast, it was the seventh test of the land-attack missile, and the first test using an indigenously built turbo-engine.

According to top DRDO officials, the wide range of tests proved the organisation's self-sufficiency in missile technology. Regarding the reason behind the frequent

tests, the officials said it related to the COVID-19 pandemic. "Most of the DRDO's 52 laboratories were functioning during the lockdown imposed in view of the pandemic but several tests had to be deferred as the movement of personnel was restricted," they explained.

Yet another test involved the BrahMos supersonic cruise missile with an indigenously





built rocket booster, airframe and power distribution system. The test aimed to increase the indigenous content of the missiles. Moreover, DRDO successfully test fired Rudram-1, an anti-radiation missile, from the Integrated Test Range, Balasore.

Hypersonic missile system

DRDO plans to develop a complete hypersonic cruise missile system which will have the capability to strike its targets at speeds at least double that of the world's present fastest BrahMos supersonic cruise missile and the Hypersonic Technology Demonstrator Vehicle is the first step in this direction. DRDO Chairman Dr G Satheesh Reddy said cruise missiles fly at a lower altitude. "Among them, we have subsonic cruise missiles, supersonic cruise missiles and hypersonic cruise missiles. The hypersonic cruise missiles travel at six, seven or eight times the speed of sound, which is approximately 300

metres per second," he said.

"Our test vehicle had a scramjet engine, which works at hypersonic speed, taking the oxygen in the atmosphere and then burns it," he added. "During the test, the scramjet engine in the hypersonic cruise vehicle was taken to a designated height and released at the specific Mach number. Then, the engine was ignited and tested," he said.

The DRDO chief said the experiment was successful. "It paves the way for us to work on these technologies for longer ranges," he added.

On when a hypersonic cruise missile system would be fully developed, Reddy said, "It will take probably about four to five years for us to work on all these things and realize a complete missile system working for some good amount of range."

At present, the BrahMos supersonic cruise missile is considered to be the world's fastest cruise missile with speeds of around 2.8 Machs. Regarding the successful test



of the BrahMos in September 2020, the DRDO chief said the missile was tested with heightened indigenous content. The BrahMos Extended Range Missile can be launched at targets beyond 400 km and can strike its targets at longer ranges than before. It was earlier used for striking targets slightly less than 300 km.

"India has achieved self-reliance in the field of missile systems and can produce whatever is required by the armed forces within the country itself," he affirmed.

Reddy was speaking in the backdrop of DRDO conducting over 10 successful missile tests within a short span of five weeks including that of the Shaurya hypersonic missile, BrahMos extended-range missile, Prithvi nuclear-capable ballistic missile, Hypersonic missile technology development vehicles, Rudram-1 anti-radiation missile and the Supersonic Missile Assisted Release Torpedo weapon system.

The DRDO chief said the private sector industry in India has risen to the occasion. "They are able to not only partner with us but also develop the system as per our specifications."

Referring to the successful missile tests at a time when India was engaged in a conflict with China on the border, Reddy said the focus of DRDO was to develop the state-of-art weapon systems to equip our armed forces. "As part of that responsibility, DRDO has been working on many weapon systems. Even during the COVID-19 period, scientists have been continuously engaged in this task. All these systems have matured and hence whenever a system is ready, we are going for further developmental trials," Reddy explained.

Reddy also spoke about DRDO's contribution to the Atma Nirbhar Bharat campaign launched by Prime Minister Narendra Modi. "The organisation has started working in many areas to make indigenous systems and now we are strong and completely self-reliant in the areas of missiles, radars, electronic warfare systems, torpedos, guns, and communication systems and so on," he said.

DRDO scientists are continuously looking at various systems which are being imported now and trying to develop indigenous versions, he added. "We are helping the industry

in a big way and supporting them in developing various systems," he said.

"DRDO has also given 108 items completely designed and developed by the industry. We have instituted a technology fund to support such industries and opened our test facilities to them. Now, we are taking industry partners right from the beginning of the projects," he said.

He added that DRDO is focusing on more advanced and complex technologies. "We want to make India an advanced technology nation for fulfilling the Prime Minister's dream of Atma Nirbhar Bharat," he said.

Rudram-1 missile

Among the tests conducted in rapid succession, that of Rudram-1 is considered a major landmark. "The Rudram-1 anti-radiation missile launched from a fighter aircraft would require a few more tests to be completely proven and will provide Indian Air Force (IAF) with the capability to strike enemy radars including surveillance and air defence systems," said Reddy.

The Rudram-1 missile system was successfully test-fired from a Sukhoi-30MKI fighter aircraft near the East Coast of the country and it hit the intended target successfully. "Rudram-1 is basically an anti-radiation missile launched from an aircraft and when you release it, it will be able to detect any emitting element and lock on to that element. The missile will then be able to act on the element," said the DRDO Chairman.

"Once the missile is inducted by the IAF, it will strengthen the force attacking the enemies emitting elements (Radars)," he explained.

Even though almost all recent tests were

successful, Nirbhay did not produce the intended result. However, the DRDO chief said that Nirbhay had been test-fired earlier and successfully completed all the development trials. "In the latest test, we only wanted to increase the indigenous content by incorporating the engine and various other parts. The missile took off very well and the separation and many other staged worked as planned. The engine also started functioning very well. But, after that, there was some snag," he said. DRDO scientists are looking into the snag and would solve it soon, Reddy added.

Nirbhay is a subsonic cruise missile with ranges of around 1,000 km.

SMART Weapon

Meanwhile, Reddy said that once fully developed, the SMART weapon system would boost the Navy's anti-submarine warfare capability and allow it to engage enemy submarines from far-off distances.

The SMART weapon system was successfully test-fired for the first time in October during which a supersonic missile launched a torpedo against a simulated submarine as a target and the test was a total success. Reddy elaborated, "A torpedo has a limited range capability. But, the range is enhanced through many mechanisms, one of which is a supersonic missile-assisted release of the torpedo, called SMART."

A torpedo is incorporated in the front sections of a missile, which carries the torpedo to the designated point and then opens it up. "These operations successfully functioned in the very first attempt itself," Reddy said.



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We will restore confidence in air travel: Collins Aerospace



Chris Forrest
Vice President
Airport Systems, Collins Aerospace

Top players in the aviation sector are working hard to solve the issues created by COVID-19. Even though the challenges are big, there is optimism in the industry about creating innovations that would make commercial air travel safe, smart, and comfortable. Chris Forrest, Vice President, Airport Systems, Collins Aerospace explains the current scenario as well as future plans.

Commercial aerospace is among the key sectors Collins Aerospace has been involved in. Now the COVID-19 pandemic has changed the sector forever. Could you elaborate?

COVID-19 has changed the air travel industry dramatically. I don't think you'll find many people who would disagree with that sentiment. We are working hard with our peers in the industry to adjust to this new reality of travel. We've always innovated for the future of flight and worked tirelessly to make commercial air travel as safe, smart and comfortable as possible. So working to address the challenges a novel virus has created for this industry is really what we were built for. It's why we exist. And we're as dedicated as ever to working with the world's top experts in health, government and aerospace to solve this issue and help restore confidence in air travel.

Do you feel any aspect of the past flying experience would survive the pandemic?

Our industry has consistently been at the forefront of safety and technology. And now, we are working harder than ever to find the most reliable materials, systems and solutions to make the travel experience as safe and comfortable as possible. That aspect of air travel will never change. We'll continue to invest heavily in research and development to bring airlines the most technologically advanced solutions that solve their passenger's greatest concerns and meet their most pressing needs. The future flying experience will certainly look different, but I think that's a good thing.

Passenger journey has changed dramatically but there are anxieties about infection. Could you tell us how passenger confidence could be restored?

Collins Aerospace is taking a close look at all aspects of the passenger journey to restore the confidence the public has in air travel. Everything from check-in, to baggage drop and all the touchpoints found throughout the aircraft cabin are under an intense review. We've developed a cross-functional team that touches all aspects of our business and have partnered with airlines, OEMs, healthcare professionals, government entities and renowned academic and research institutions to investigate this very topic.

The first step Collins Aerospace is focused on is expanding the contactless passenger journey. For instance, a single token-based journey takes a passenger's biometrics – typically a facial image – and ties it to the passenger's boarding pass and government issued ID. Once enrolled, facial recognition enables the passenger to securely move through each touchpoint in a touchless, automated self-service fashion using their biometric as the travel token. Passengers can also choose to enroll and fly at a later date. In addition, solutions are being developed to help passengers safely navigate areas of the airport that typically face the most congestion: baggage check, security and immigration lines, boarding gates, and baggage claim areas. Passengers looking to travel in the near future with a six-foot distance from their peers, will demand airports address these areas of congestion by better enabling a contactless journey.

Exciting projects are going on inside the aircraft cabin, as well.

We're creating lavatories that are more touchless with sensor and infrared technology - and we're making them more sanitary with toilets that virtually eliminate the aerosolization of waste and wastewater.

We're also investigating new materials with inherent antimicrobial properties that can be implemented in applications throughout the cabin. Materials that stand up to harsher and more rigorous cleaning



Off-Airport Check In and Baggage Drop and Biometrics—are enabling new processes that focus on keeping each touchpoint safe and virus-free. Airports see their value as efficiency drivers and vital to promoting curb-to-curb passenger confidence.

Off-Airport Processing

This technology enables passengers to check in, check their bags and get flight details from a number of remote locations, including hotels and resorts, rental car agencies, theme parks, convention centers, train stations and other settings. Collins' ARINC OnVoy platform solution, for example, brings a secure and cost effective way to move processing and queues away from the airport. In the age of COVID-19, this technology eases the pressure on airport terminals and helps de-stress the traveler's airport arrival process.

Biometrics

While not new, Biometrics are not commonly in use for the outbound journey, even in larger global airports. They should be—and as quickly as possible. When leading-edge biometric technology overlays each airport touchpoint so that a passenger's face becomes that passenger's identification—instead of constantly pulling out a driver's license, passport or boarding pass—all airport touchpoints become part of a single end-to-end biometric journey that is contactless, seamless and faster.

JFK BA Biometrics Boarding Gate.

practices, while still maintaining the highest structural integrity standards and preserving the comfort and aesthetic qualities passengers have come to expect.

Additionally, we're experts in aircraft environmental control systems and how air flow in the cabin is best utilized, exchanged and ventilated. Alongside our air management systems, we've developed drop-in HEPA filtering kits for aircraft that previously didn't have the hospital-grade kit solution available on their fleet - increasing air purity by removing and trapping at least 99.97% of the harmful airborne particles that have a diameter of 0.3 micron.

That's really just the beginning, too. We're implementing hand sanitizing stations throughout the aircraft, exploring seating options to best optimize hygienic

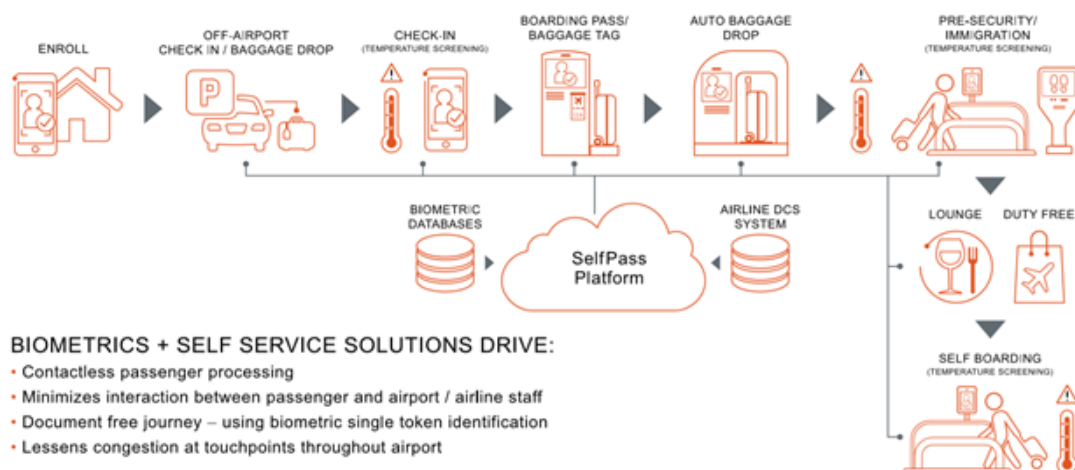
practices and investigating specialized lighting solutions that help reduce the effectiveness of pathogens in the air.

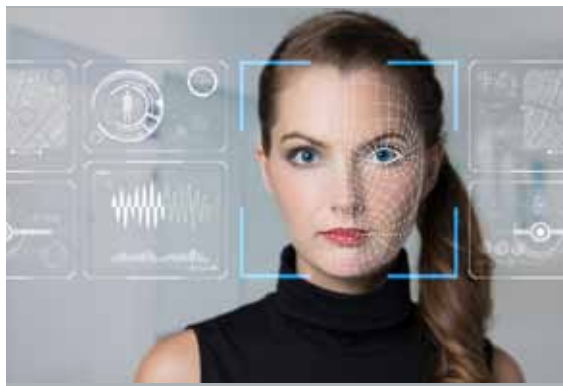
In fact, many of these solutions can be quick-turn, cost-effective options that have either already been installed on-board commercial aircraft or can be easily implemented within existing cabin architecture. That's our primary focus right now - to swiftly provide technologies our airline partners need to help restore public confidence in air travel.

What are the new projects being implemented by Collins Aerospace to reduce the risks of the infection on the ground?

The illustration below shows major touchpoints in a passenger's airport journey. New technologies—specifically,

COLLINS CONTACTLESS PASSENGER JOURNEY





CAT - CBP Embraces Biometrics and Facial Recognition Tech for Border Security

There are people who have raised privacy concerns about the new plans being implemented to reduce the risk of infection. How is Collins Aerospace addressing these concerns?

Collins does not collect or withhold any information. Passenger Name Records (PNR) are provided by the airlines' PSS and the information is passed on to Immigration & Customs for clearance purposes. For applications such as Collins' electronic cabin bag, the passenger manifest is provided by the airlines and it is synced up onto the server prior to the flight and if there are any seat upgrades/changes, it's being logged digitally and tracked to reflect the changes. Once the flight is over, the data gets synced with the main server and all data is removed. Collins does

not collect or withhold any information.

Cooperation between nations is vital for any safety programme involving international travel to succeed.

Could you suggest how such joint efforts can be implemented?

Our border management solutions have been providing cost effective, efficient and seamless API, iAPI and PNR for multiple government agencies worldwide, and we are able to assist nations in the acceleration and implementation of bilateral travel agreements while ensuring it meets all industry standards and protocols.

It is also pointed out that the future has arrived suddenly in the aviation sector because of COVID-19. In such a situation,

how do you analyse the future of civil aviation? Any diversification plans?

We plan for the future by keeping a watchful eye on industry trends, remaining in consistent conversation with customers and industry experts and utilizing the best available research to inform our decision making.

We are always evaluating opportunities to expand business offerings and improve our operational and strategic goals.

Asia has been one of the major markets of your company. How do you see the future prospects of the region in view of the present situation?

Although the aviation industry has been hit hard by COVID-19, we are confident that future prospects remain bright in the Asia-Pacific region as we work together with fellow industry members to navigate through this pandemic. The region is a major market for Collins and we will work hard to deliver on our commitments to our customers and business partners. We are also doing our part to develop and introduce solutions such as contactless passenger processing systems at airports and air filtration systems in cabins to accelerate recovery and restore confidence to fly.

BEML bags SKOCH award to contain Covid-19

B EML LIMITED, a schedule 'A' company under Ministry of Defence, Govt. of India, received the prestigious SKOCH Award in Gold Category, for outstanding work in response to contain Covid-19.

Deepak Kumar Hota, CMD, BEML received the award at a virtual award ceremony.

SKOCH Foundation recognizes People, Project and Institutions that go the extra mile to make India a better nation.

To combat Covid-19, BEML implemented various standard operating procedures as advised by the government such as regular sanitisation, maintaining social distance and offering sanitisor at work places, distributing mask & medical kits through BEML Women's

Association. BEML also opened Covid Care Center for the employees and their families for the treatment of those affected by the virus.

BEML propagated good health practices by putting up hoardings, banners and other related information materials. Social Media platforms were used to spread awareness about precautionary measures to stay safe & healthy.

Apart of this, BEML through its Standard Operating Procedures (SOP) provided guidelines to break the chain of corona virus and to resume work in its plants and townships. The award was given to BEML on the evaluation of peer & Jury and number of votes received.



BrahMos Cruise Missile Successfully Test Fired from Navy's Stealth Destroyer, INS Chennai



BrahMos, the supersonic cruise missile was successfully test fired from Indian Navy's indigenously-built stealth destroyer

INS Chennai, hitting a target in the Arabian Sea. The missile hit the target successfully with pin-point accuracy after performing high-level and extremely

complex manoeuvres.

BrahMos as 'prime strike weapon' will ensure the warship's invincibility by engaging naval surface targets at long ranges,

thus making the destroyer another lethal platform of Indian Navy. The highly versatile BrahMos has been jointly designed, developed and produced by India and Russia.

Defence Minister Rajnath Singh congratulated DRDO, BrahMos and Indian Navy for the successful launch.

Secretary DDR&D & Chairman DRDO Dr G Satheesh Reddy, congratulated the scientists and all personnel of DRDO, BrahMos, Indian Navy and industry for the successful feat. He stated that BrahMos missiles will add to the capabilities of Indian Armed Forces in many ways. ■

RF Seeker Manufacturing facility of VEM Technologies inaugurated



Dr. G. Satheesh Reddy, Chairman, DRDO, Jayesh Ranjan, Principal Secretary, Industries & Commerce and IT Department, Govt. of Telangana, V. Venkata Raju, CMD, VEM Technologies Pvt Ltd during the event.

The Advanced Systems Division – RF Seeker Manufacturing facility of the VEM Technologies Pvt. Ltd. has been opened in Telangana. The new facility

was inaugurated by Dr. G. Satheesh Reddy, Secretary Department of Defence R & D and Chairman, DRDO in the presence of Jayesh Ranjan, Principal Secretary,

Industries & Commerce and IT Department, Govt. of Telangana.

VEM Technologies Pvt Ltd, a prominent Aerospace and Defence Company was founded by V. Venkata Raju. It is a Systems Engineering Company offering solutions to the Armed Forces making the country self-reliant. The Advanced Systems Division of Seeker Manufacturing facility was manufactured with the soft financial assistance from Technology Development Board – DST, GOI for the "Development & Commercialisation of RF Seekers".

The ASD is a state-of-the-art infrastructure that can

manufacture two RF Seekers per day. The facility is built to cater to IIR Seekers for various Missile Programmes. VEM invested over Rs. 100 Crs., in building this world class infrastructure, first of its kind in the private sector, with 125 K sq. ft area with all the amenities to make the sub-systems required for RF Seekers and IIR Seekers and to carry out the assembly, integration and testing of Seekers under one roof.

Venkata Raju, the Chairman and Managing Director of, VEM Technologies thanked the Chief Guest and other dignitaries who attended the event. ■



Theunis Botha
CEO
AL TARIQ

AL TARIQ gives Thrust on Innovation, Export Market

AL TARIQ, a member of the UAE based EDGE group is one of the world class manufacturer of precision-guided air munitions and systems. Theunis Botha, CEO of AL TARIQ speaks to Aeromag on the success stories of the company, new initiatives, manufacturing capabilities and future programs. AL TARIQ is actively looking at India as its potential market and ready to support the Make in India initiatives of the Indian government, says Theunis Botha, CEO of AL TARIQ.

Since its inception, AL TARIQ has marked its own signature in the manufacture of precision-guided air munitions. Could you just sum up the major milestones in the journey to success over these years?

AL TARIQ is the first UAE-based manufacturer of precision-guided systems for conventional air munitions. Established in 2012 as a joint venture with Denel, South Africa's largest government-owned defence manufacturer, we launched the 'AL TARIQ' modular guidance kits to mark this milestone, and it remains our flagship product to date. Working with Denel Dynamics, we have built up our production capability over a short period by focusing on production expertise and continual innovation. Since then, we have enhanced our engineering capabilities and have implemented a range of operational features through cutting-edge technology and continuous innovation into the Block II version of AL TARIQ. We have also enhanced our production capacity through cost saving measures and continuous improvement in our operations.

The rising challenges in airborne defence require combat-driven munitions that are smaller, smarter, and faster. How does AL TARIQ plan to tap the potential in airborne defence by competing with other major players?

We offer a niche and competitive product portfolio of precision-guided

munitions (PGMs) that can greatly enhance strike capabilities with a class leading stand-off range. Our fire-and-forget system helps improve aircrew and aircraft safety, and its seeker technologies mitigate collateral damage by delivering a very high degree of accuracy. Advances in navigation solutions have added to the precision of AL TARIQ's weapons. In the future, our focus is to implement various new smart technologies within the flexibility of our range of precision-guided weapons.

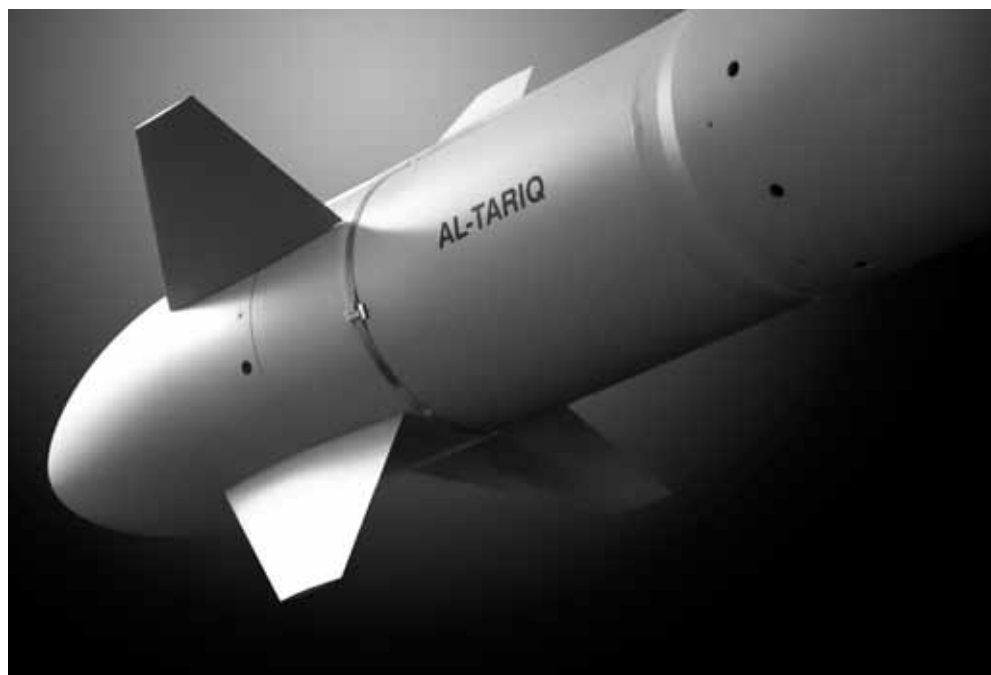
Could you elaborate on the product line-up of AL TARIQ in various fields like precision-guided munitions, fire-

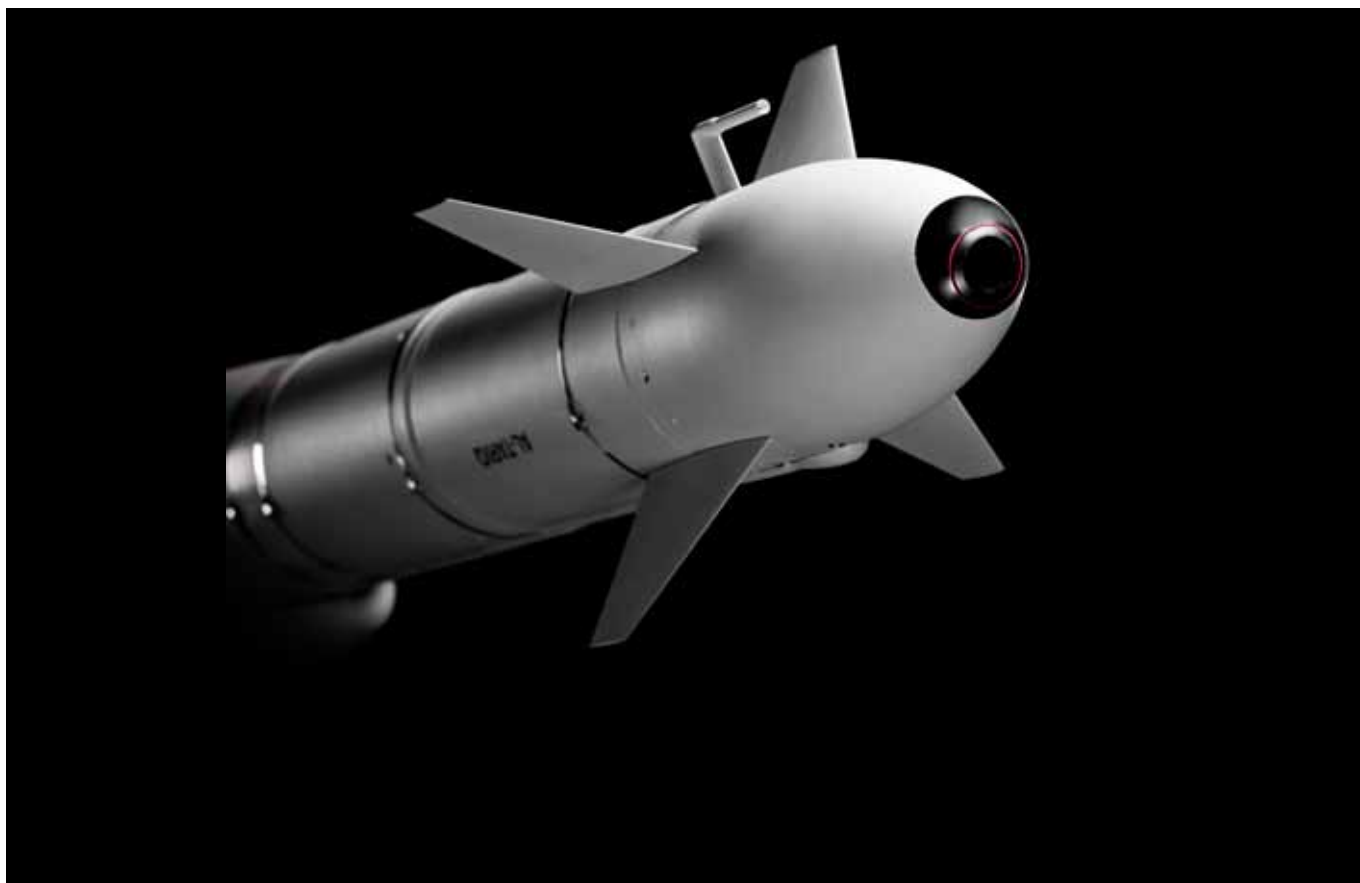
and-forget and seekers? Who are the major customers of your products?

We design and produce the 'AL TARIQ' range – a modular family of precision-guided munitions designed for the Mark 81 and Mark 82 aerial bombs. With multiple configurations being available, each weapon configuration performs in diverse missions to ensure that our forces are protected on the front line.

The 'AL TARIQ' family will be expanded in the future to include other versions of aerial bombs. We are currently in the process of integrating this on to more aerial platforms for future applications.

Our main customer is the UAE Armed Forces, who currently use the





full range of the 'Al Tariq' family of weapons. We are also in discussions with a few countries for exports.

Leveraging the latest advanced technologies gives AL TARIQ an edge in optics, and weapons. Please shed some light on your manufacturing capabilities and production facilities.

We operate one of the region's most advanced engineering labs focused on environmental stress screenings across all operating and storage environments, including temperature and vibration. Our in-house metrology lab also performs quality inspections on parts we procure. We have a strong engineering team with world-class expertise in electronics, mechanics, software and weapon integration, who constantly push the boundaries of technology for the improvement of the system.

The advanced technologies enable our engineering team to create local intellectual property across multiple engineering disciplines including digital electronics, software development and mechanical designs for use in future applications.

India has been actively enhancing its defence manufacturing by attracting international players through schemes like Make in India. How does AL TARIQ look at the Asian defence industry, especially the Indian, as a market of growth?

The Indian defence sector has huge potential to attract foreign direct investment. The new policies will encourage multinationals to set up manufacturing bases in India or acquire local companies. AL TARIQ recognises the rapidly growing market in India, and we are involved to address the future requirements of the Indian Armed Forces. We have engaged with Indian defence companies to address the future "Make in India" programmes for the Indian Ministry of Defence. This will entail the future production and co-development of high technology systems as required by the Indian Defence Forces.

The COVID-19 pandemic has affected all industries including defence. How is your company coping with the impact and what are the measures taken to overcome the challenges?

The pandemic has forced us to adapt and alter the way we work and operate. We

are continuing to enhance our 'Al Tariq' range of PGMs and are currently in the process of starting our planned production for the Block II version towards the end of 2020. The Block II version features a number of new operational upgrades that greatly enhance the system's capability.

In terms of coping with the pandemic challenges, like any other company, we have been ensuring that our employees have the means to perform their duties safely and efficiently, while maintaining business continuity. All operations and business functions are continuing as normal despite the unprecedented pressures.

Could you share your vision and objectives for AL TARIQ?

The company's vision is to continually enhance our range of precision-guided munitions through innovation, advanced technology, and added value. As mentioned earlier, we want to focus on the modularity and flexibility of our systems' solutions, which enable it to adapt to new priorities as the nature of warfare evolve. Our immediate emphasis is to produce the latest Block II version of 'Al Tariq' and offer it to our customers.

Chief of Navy Reviews Operational Readiness at Sea



Admiral Karambir Singh, the Chief of the Naval Staff (CNS), with senior officers of Navy.

Admiral Karambir Singh, the Chief of the Naval Staff (CNS), reviewed the operational preparedness and combat-readiness of the Indian Navy's principal combatants.

CNS accompanied by Flag Officer Commanding-in-Chief Western Naval Command, Vice Admiral Ajit Kumar, arrived at Karwar Naval Base where he interacted with personnel and emphasised key issues of repairs, maintenance, spares support and op-logistics for afloat units to sharpen their war-fighting capabilities. He also reiterated aspects of cyber-security, force protection against terrorist attacks, asymmetric warfare and exhorted all personnel to maintain highest-level of alertness.

Admiral Karambir Singh thereafter departed by helicopter to embark the Carrier Battle Group, comprising Vikramaditya, destroyers, frigates, corvettes, fleet support ships and integral swing-role fighters and helicopters. On embarking indigenous guided-missile destroyer Chennai, he was given an operational readiness briefing by the Fleet Commander, after which weapon firings, air-to-air combat operations, anti-submarine drills and fleet manoeuvres were demonstrated under realistic conditions. CNS thereafter embarked Fleet Support Ship Deepak to interact with the ship's crew, followed

by embarkation on aircraft carrier Vikramaditya, where he witnessed the Carrier Battle Group's capabilities for integral fleet air defence and strike.

Addressing the combatants of the Carrier Battle Group over broadcast from Vikramaditya, CNS complimented them for continuously maintaining peak combat-readiness and high tempo of operations over the past months, in spite of COVID-19 related challenges. The Indian Navy has remained mission-deployed and combat-ready across the IOR, even through rough seas during the monsoon period, towards maintaining the maritime security of the nation. He highlighted the nation's appreciation for the Navy's contributions in 'Op Samudra Setu' towards repatriation of our distressed citizens from IOR countries and towards providing medical and logistics assistance to our friendly neighbours in the IOR, as part of 'Mission SAGAR'. He expressed satisfaction at the high levels of motivation and reiterated that the Indian Navy has the best human capital manning our platforms.

Giving an overview of the prevailing security situation, he stated that the Navy would continue maintaining a high-tempo of operations in coming months. He also complimented the Carrier Battle Group and its combatants for accurate and effective weapon

firings, which left no doubt about the Navy's readiness to meet any emergent contingencies. CNS highlighted that tri-service synergy and coordination has peaked with establishment of the Department of Military Affairs as was visibly demonstrated in the joint response of the three Services to recent events.

CNS also advised continued compliance of protocols by naval personnel and their families, in regard to COVID-19 pandemic. CNS visited the Naval Aircraft Yard at Goa also.

Concurrent with CNS's review of combat readiness on the Western seaboard, the Indian Navy's Anti-Submarine Warfare (ASW) capability was further augmented by commissioning of ASW Corvette Kavaratti by General Manoj Mukund Naravane, Chief of the Army Staff, at Visakhapatnam, on the Eastern seaboard. Designed by the Indian Navy and built at Garden Reach Shipbuilders and Engineers Ltd, Kolkata, the ship is a fine example of Atmanirbhar Bharat.

Indian Navy continues to maintain a high tempo of operations and combat-readiness despite the COVID-19 pandemic by adhering to stringent protocols onboard warships, submarines and aircraft squadrons and bases, and is fully prepared to tackle challenges in the maritime domain, in coordination with Sister Services. ■

SPECIALITY FASTENERS FOR VARIOUS APPLICATIONS

Randack is a family owned Business House, located in Germany, with its roots in the business excellence of Speciality Fasteners. In Germany, it is a third generation family business running since last 60 years.

The Indian subsidiary Randack Fasteners India was formulated in 2008 spread across 8 acres of land located in Pune, Maharashtra, with a vision to cater to the specialty Fasteners business in India. It is headed by Mr. Sateesh Bhide. The company is a joint venture between two German companies – Randack Spezialschraubfabrik, Germany & Klaus Union, headed by Directors – Mr. Jens Randack and Mr. Thomas Eschner respectively.

Location India : Randack Fasteners India is an exemplary theme of India's ability to match World class manufacturing practices and meet the requirements of Indian & Global supply chain. We at Randack are proud to say that we have honored our honorable Prime ministers "Make in India" initiative and are exporting specialty fasteners across the globe. With this we have certainly observed a bullish growth in the skill, knowledge and test facilities with the manufacturers in India.

Range of Customers : Some of our Customers range from Renewable energy Sector - Wind, Hydro, and Thermal to Transportation Sector – Railways and Aerospace to other verticals like Construction, and Gas Engines etc. Basically we have our presence in all types of industries where the customer respects the criticality of fasteners and it is not considered as a "C" Class hardware.

Advantages and Products offered by RFI : Randack group as a whole is not only a fastener manufacturer, but also a solution provider. Having a Global presence (Europe, US and India), we can cater almost off the shelf to urgent customer requirements. Our range of products include various types



***"You just make it and we will grip it",
is what we always say.***

of high tensile Bolts and nuts ranging from sizes M24 and above, all hot forged and consisting high alloy steels, and special steels.

Solution Provider : RFI has always been associated with taking up new challenges and innovations leading to cost saving and process improvement both for the customer and self. Customers come not only for supply of fasteners, but we help develop the right hardware for them many times. With a strong back up of German Technology and our Knowledge of materials and processes we are able to support Customer design their requirements.

In house special processes : In addition, we have a specialized line of Zinc Flake coating under license of Dorken, which makes us a unique combination of manufacturing and specialized coating. We also added in year 2018 a heat treatment facility which is equipped with state of the art equipment, supported by a very well equipped material testing lab which is NABL accredited and professional technical staff to provide our customers a broad range of experience to deliver their requirements.

But the cutting edge is the zeal for quality and trust that we build in the customer mind.

Distribution network:

In Europe : Randack Spezialschraubfabrik, Hagen Germany.

In Asia and Middle East : Randack Fasteners India, Pune Maharashtra, India

In South and North America and Canada: Randack Fasteners America, Illinois Chicago

Randack Fasteners India Pvt. Ltd.
Gat No. 1197, Ghotawade Phata, Village - Pirangut,
Tal - Mulshi, Dist - PUNE - 412108, India.

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website - www.randack-india.com

HAL and Tech Mahindra Sign Rs 400 Crore Contract for 'Project Parivartan'



Hindustan Aeronautics Limited (HAL) and Tech Mahindra (TM) signed a contract worth Rs 400 crore recently in Bengaluru for implementation of Enterprise Resource Planning (ERP) to support HAL's 'Project Parivartan'. The 'Project Parivartan' is a comprehensive business transformation exercise initiated by HAL through technology enhancement

and centralized ERP, says R Madhavan, CMD, HAL. The exercise will enable HAL to adopt some of the best practices followed in some of the similar industries globally, he adds.

Sujit Bakshi, President Corporate Affairs and Business Head Emerging Markets, Tech Mahindra, said, "Tech Mahindra's selection by Hindustan Aeronautics Ltd extends our vision of

supporting government's 'Atmanirbhar' (self-reliant) initiative to enhance our indigenous capabilities. This project will transform HAL's ERP system, serving the Armed Forces in an efficient and effective manner. This is in line with our TechMNxt charter that focuses on leveraging new generation technologies with original equipment manufacturers and aims to deliver an enhanced experience to our customers."

The contract was signed by Dibyendu Maiti, Executive Director (Corporate Planning), HAL and Prashanth S, Group Competency Head, Tech Mahindra in the presence of R Madhavan, CMD, HAL

Tech Mahindra will be responsible for the transformation and

modernisation of the ERP System as an implementation and support partner enabling HAL to streamline and standardize its business processes across the organization. As a system integrator, Tech Mahindra will implement 'Project Parivartan' over a period of nine years at a cost of Rs 400 crores. Tech Mahindra will transform the distributed application to a centralized application, for all the 20 divisions and R&D Centers of HAL based on a business transformation engineering process. This includes centralized ERP Turnkey Solution to meet HAL's business requirements with implementation of SRM, CRM along with select non-ERP applications.

High maintenance season for AMAC Aerospace

AMAC Aerospace has announced that two Head of State aircraft has arrived in October in Basel, Switzerland for maintenance. Furthermore, AMAC has been selected to carry out maintenance checks on several Airbus, Bombardier and Boeing aircraft and offers cabin disinfection services

for any aircraft type.

The McDonnell Douglas MD-87 is waiting at Hangar 2 to get the systems upgraded AMAC Aerospace were pleased to recently welcome a Head of State McDonnell Douglas MD87 in its headquarters in Basel, Switzerland. AMAC's team will install a new generation

of the Cockpit Voice Recorder ('CVR') and a Flight Data Recorder ('FDR') system. In addition, the Head of State aircraft will undergo multiple C-checks and a landing gear overhaul. A second Head of State, a Boeing B747-8, has arrived mid of October to undergo a C-check. Three maintenance projects on Airbus aircraft AMAC was awarded three maintenance projects on Airbus aircraft. A privately-owned Airbus ACJ319 will arrive in the next few weeks in Basel. AMAC's Airbus team will carry out avionics update in combination with a heavy base maintenance check.

A privately-owned Airbus A319 recently arrived to undertake 1A-, 2A-, 1C-, 2C- and 4C-inspections. In September, a privately-owned Airbus A318 checked in to undergo 1A-, 2A-, 3A-checks as well as Out Of Phase ('OOP') tasks.

"Despite limitational circumstances of COVID-19 pandemic, AMAC are pleased to have regular maintenance inputs. We are happy to see a slow improvement of flight activities in business aviation. This shows a positive impact in our business segment", said Alexis Ott, Director Maintenance Sales & Key Account Management.



Gulfstream G500™ & G600™ demonstrates additional range capabilities

Gulfstream Aerospace Corp. announced the next-generation Gulfstream G500™ and Gulfstream G600™ have once again demonstrated additional range capabilities through real-time operations. The newly increased range for the G500 and G600 apply to both the high-speed cruise of Mach 0.90 and the long-range cruise speed of Mach 0.85. The G500 now delivers 5,300 nautical miles/9,816 kilometers at Mach 0.85 and 4,500 nm/8,334 km at Mach 0.90.

The G600's range at Mach 0.85 has improved to 6,600 nm/12,223 km and 5,600 nm/10,371 km at Mach 0.90. "The G500 and G600 have been exceeding expectations since they entered service," said Mark Burns, president, Gulfstream.

"This latest demonstrated range increase provides further proof of the tremendous

efficiency and versatility of these aircraft. The Gulfstream team is always looking for opportunities to improve aircraft capabilities and the customer experience, and we are pleased to deliver another performance enhancement for both existing and future customers." In addition to the range increases, the G600 now delivers greater payload capacity with full fuel. As a result of Gulfstream's advanced manufacturing and precision-build expertise, the G600's basic operating weight has been reduced by 570 pounds/259 kilograms over original values, bringing its full-fuel payload capabilities up to 2,600 lbs/1,179 kg. This gives G600 operators even more flexibility. – "What's exciting for our existing customers is that these improvements already exist on their inservice aircraft with no modifications required," Burns said. During



the flight-test program for the G500 and G600, both aircraft exceeded initial performance expectations with increased range capabilities.

The G600 achieved a second high-speed cruise range increase before it entered service, gaining 700 nm/1,296 km over original projections. The maximum operating speed of both aircraft is Mach 0.925.

Inspired by the belief that aviation could fuel business growth, Gulfstream Aerospace Corp. invented the first purpose-built business aircraft, the Gulfstream I™, which first flew in 1958. Today, nearly 2,900 aircraft are in service around the world. Together with parent company General Dynamics,

Gulfstream consistently invests in the future, dedicating resources to researching and developing innovative new aircraft, technologies and services. Gulfstream's fleet includes the super-midsize Gulfstream G280™, the award-winning Gulfstream G650™, the high-performing Gulfstream G650ER™ and an all-new aircraft family, the clean-sheet Gulfstream G500™, Gulfstream G600™ and new industry flagship, the Gulfstream G700™. All are backed by Gulfstream's Customer Support network and its worldwide team.

Visit www.gulfstream.com. More information on General Dynamics www.generaldynamics.com.

All Nippon Airways Signs De Havilland Component Solutions Agreement

De Havilland Aircraft of Canada Limited ("De Havilland Canada") has signed a five-year De Havilland Component Solutions ("DCS") agreement with All Nippon Airways ("ANA") to support the operation of ANA's fleet of 24 Dash 8-400 aircraft. Under the agreement, De Havilland Canada will manage component maintenance, repair and overhaul (MRO) services for the fleet of aircraft. The DCS program will also provide access to a strategically located exchange pool, and an

on-site inventory based at the airline's hub in Tokyo, Japan.

"We welcome the support that De Havilland Canada will be providing through the DCS program and we look forward to continuing our long-term relationship to enhance our Dash 8-400 aircraft operations," said Kenshi Hamada, Vice President & General Manager, Materials Management, ANA. "We anticipate that the program will help us manage the life cycle costs of our fleet and enhance the in-service performance of our Dash 8-400 aircraft to the

benefit of our passengers."

"We are delighted to welcome All Nippon Airways, a long-time operator of Dash 8 Series aircraft to the De Havilland Component Solutions program," said Amod Kelkar, Vice President, Customer Services and Support, De Havilland Canada. "Our Component Solutions program is highly adaptable

to meet our customers' varied business models and we are confident that ANA, who have received our Airline Reliability Awards on 12 occasions since the Awards were introduced in 2007, will be able to further enhance their operations and benefit from the cost predictability and superior parts availability that the DCS program provides.





Su-30MKI, a milestone in India-Russia partnership

India's Ministry of Defence (MoD) recently approved the proposal for procurement of additional 12 Su-30 MKI fighter jets. Termed by MoD as the 'most lethal front-line fighter aircraft', Su-30 MKI is the result of a successful joint programme between India and Russia's Rosoboronexport, which has turned 20.

As Russia's Rosoboronexport state intermediary company celebrates its 20th anniversary, the landmark Su-30 MKI fighter jet programme executed by Russia and India is again in focus. In July 2020, the Defence Acquisitions Council (DAC) under India's Ministry of Defence (MoD) officially approved the proposal for procurement of additional 12 Su-30 MKI fighter jets, which are produced jointly by the two countries.

The product of an unmatched international project, Su-30MKI aircraft has been recently dubbed by the MoD as the 'most lethal front-line fighter aircraft'.

The first contract to deliver Su-30MKI jets to the Indian Air Force (IAF) was signed on November 30, 1996 in Irkutsk,

Russia, between Rosvooruzhenie state intermediary company (predecessor of Rosoboronexport) and MoD. It envisaged the delivery of 32 Su-30MKI, all of which were produced in 2002-2004. Satisfied with the performance of the new Sukhoi jets, the MoD placed additional orders. On December 28, 2000 the general contract for organizing the licensed production of Su-30MKI in India at Hindustan Aeronautics Limited's (HAL) facilities was signed in Irkutsk. In 2012, another contract for technological kits of Su-30MKI was inked.

Advanced features

At the time of induction into the IAF, Su-30MKI programme was unique for India in terms of functional capabilities of

the new aircraft; the level of participation of India in choosing the technological configuration of the aircraft and the overall scale of technology transfer. Su-30MKI became one of the first serially-produced combat aircraft with super maneuverability features as well as the first export aircraft equipped with the phased-array radar. The supermaneuverability is achieved due to engines with thrust vectoring and advanced fly-by-wire system. It not only provides unmatched superiority of Su-30MKI in dog fight engagements, but also enhances flight safety.

Su-30MKI can be considered a highly optimized fighter jet in terms of meeting cost-effectiveness criteria. Its weapon control system provides reliable



available evolutions of the aircraft in super maneuverability modes . Along with the organization of the licensed production, work on the overhaul of AL-31FP engines and their units has been launched.

In 2020, MoD announced that HAL had handed over the 500th AL-31FP overhauled engine to the IAF .

Meanwhile, Su-30MKI is getting more teeth for performing standoff surgical strikes with the induction of BrahMos supersonic cruise missile, which is another joint project between India and Russia. On January 20, 2020, IAF commissioned its first squadron of Su-30MKI fighter jets armed with the BrahMos-A cruise missile. In fact, Su-30MKI is currently the only Indian aircraft capable of using this missile.

India has created complex and unique infrastructure for Su-30MKI production and MRO which facilitates any future developments in the Sukhoi domain. Su-30MKI is still a potent fighter and is among the best in the world in terms of its integral capabilities of weapons load, range and maneuverability. Upgrading Su-30MKIs will enhance its capabilities even more.

Rosoboronexport

Rosoboronexport was established on November 4, 2000 by the Russian President Vladimir Putin. It is the Russian state intermediary for the exports and imports of the entire range of products, technologies and services of military and dual use. ■

detection of aerial, ground, and naval targets beyond visual range; tracking of 15 aerial targets and simultaneous engagement of four of them. The open architecture of avionics suite ensures the capability to further enhance its capabilities and expand the weapons set .

Thanks to the programme, India has received a heavy-class multifunctional fighter jet, while HAL has gained huge technological experience. Under the programme, HAL also launched the licensed assembly of Su-30MKI's AL-31FP turbofans.

The project has become one of the largest in the history of military cooperation of India with foreign countries and also contributed to the sales of Su-30MK family aircraft to other countries such as Malaysia and Indonesia. Moreover, the programme has directly influenced the development of Su-30SM fighter jet, which is currently being delivered to the Russian Air Force and offered at the global arms market (as Su-30SME).

The experience gained during cooperation under Su-30MKI programme has paved the way for new joint projects between Russia's Rosoboronexport and India. Director General of

Rosoboronexport Alexander Mikheev has termed Su-30MKI as one of the major India-Russia joint aviation projects and that the overall bilateral cooperation was fully in line with the Government of India's 'Make in India' policy.

AL-31FP engine

A significant feature of Su-30MKI programme is the licensed production of AL-31FP engines with kits shipped from Russia at HAL's Koraput engine division. AL-31FP is a high temperature turbofan engine of modular design. AL-31FP engines (each Su-30MKI has a pair of these) ensure stable operation in all



EMIS: Total Electromagnetic Solution Provider



conditions (lightning, solar flares, floods, earth-quakes) and man-made threats (nuclear explosions, war) on military installations lead to very strict performance and reliability requirements. Testing the equipment on site is also critical to military usage.

Nowadays, even some industrial applications have been adopting stringent military standards of EMI/EMC compliance for safeguarding their equipment. Commercial-military equipment integration provides opportunities for faster and lower costs in the development of military equipment. Commercial off-the shelf (COTS) use also provides access to a much larger industrial base.

- Military Radio Communication (RF radio transmitters and receivers)
- Radar Systems (Equipment susceptibility due to close proximity to strong RF fields generated by radar transmitters)
- Radiated susceptibility from commercial equipment nearby
- Satellite Systems (Communication and Positioning)
- Remote explosive devices
- Cognitive radio networks
- Aircrafts, Ships and Submarines

Point of Entry (POE) solutions for HEMP Protection

EMIS has a strong presence in solutions for HEMP (High altitude Electromagnetic Pulse). EMP causes malfunction of electronic systems by overloading the circuits, which can be extremely detrimental to military installations. The level of destruction depends on the magnitude and location of the strike. EMIS can offer the solutions for HEMP (E1 and E2 pulses) as per MIL-STD 188-125-1 & 2.



EMI Solutions Pvt Ltd is a prominent Indian company dedicated to deliver end-to-end Electromagnetic / Radio Frequency Interference Solutions to the customers. EMIS is a part of the KSI Group that includes KS Instruments and KWK Resistors; manufacturers of Instruments Transformers and Power Resistors respectively. EMIS, founded in 1998 in Bengaluru with manufacturing & test facilities located in Bommasandra Industrial Area. The manufacturing facility & processes of EMIS are ISO 9001: 2015, 14001: 2015 & ZED certified.

Product range includes

- EMI/RFI Power line filters
- HEMP filters, Feedthrough capacitors/ filters
- Coaxial EMP protectors
- HEMP Ethernet filters RJ-45 / RS-422
- HEMP Telephone line / HEMP Data line filters
- Tempest Filters
- Power quality products
- Surge suppressors & Lightning Arrestors

EMIS manufactures a complete range of EMI/RFI Power line filters in single and three phases (250V, 440V, 520V, 600V) & can offer filters with current ratings up to 2500A. The products are manufactured according to International

safety certifications UL, CSA/C-US & NEMKO ensuring that the products can now be exported to Europe, USA, Canada meeting stringent EMI / RFI standards CSA22.2, UL 60939-3 & IEC/EN 60939

EMIS is the first company in India to develop HEMP and High-performance military grade filters. The company is proud to serve the Indian Defence industry and its relationship has grown leaps and bounds with the ongoing participation in some key defence projects and many more in the pipeline.

The EMI/ EMC test facility of EMIS is accredited by the NABL accreditation as per ISO/IEC 17025:2017 standards. It offers EMC related tests (both In-House & On-Site Testing) and provide consultancy for EMC problems in Emission and Immunity. EMIS also has a DSIR (Department of Scientific and Industrial Research, Government of India) recognised R&D Lab where customers can avail a wide range of military compliance safety testing services.

Military applications affected by EMI/EMC

Military standards of EMI/EMC emission and immunity are much higher when compared to commercial applications because there is no room for error or failure. Harsh weather

BEL pays Rs 174.44 Crore final dividend to Govt of India



M V Gowtama, Chairman & Managing Director, BEL, presenting the Final Dividend cheque to Defence Minister Rajnath Singh. (L-R) Anurag Bajpai, Joint Secretary (P&C), Raj Kumar, Secretary (Defence Production), and Manoj Kumar, Executive Director (National Marketing), BEL also seen.

Navratna Defence PSU Bharat Electronics Ltd (BEL) has paid a total dividend of 280% to the Government of India for the Financial Year 2019-20. M V Gowtama, Chairman & Managing Director, BEL, presented the 140% Final dividend cheque of Rs. 174,43,63,569.20/- (Rupees One Hundred Seventy-four Crores Forty-Three Lakhs Sixty-three Thousand Five Hundred Sixty-nine and Twenty Paise only), payable on the shares held by the President of India, to the Defence Minister Rajnath Singh, at New Delhi on October 28, 2020. The Interim Dividend of 140% (on face value of Re. 1 per equity share) was paid in February 2020. ■



Dinesh Kumar Batra, Director (Finance), BEL, receiving the PSE Excellence Award 2019 at a virtual ceremony.

BEL bags ICC PSE Excellence Award

Navratna defence PSU Bharat Electronics Limited (BEL) bagged the PSE Excellence Award 2019 for Corporate Governance awarded by the Indian Chamber of Commerce (ICC) in a virtual ceremony. Dinesh Kumar Batra, Director (Finance), BEL, received the award.

The 10th PSE Excellence Awards, organised by the ICC online, is an initiative to salute the game changers and recognize the contributors to the Indian economy. BEL received the award for its excellent Corporate Governance initiatives – risk mitigation measures, training on anti-corruption and good governance policies, sharing of information on public domain, Board of Directors with independent directors and women directors, Whistle Blower policy and internal audit.

The best practices adopted by BEL in Corporate Governance include:

Digitalization of the Board - BEL has provided iPads to all the Directors for conducting various committee and strategic meetings through videoconference, complying with all the statutory requirements, and thereby saving time and cost of travelling, saving of pages for printing agendas and thereby giving boost to the Go Green Initiative; Independence - Ensuring independence to Independent Directors, allowing them to develop their own thinking, practical approach and flexibility in monitoring the company's business. The expertise of Professional Directors having varied experience in diverse areas helps the Board immensely in establishing innovative Corporate Governance; Compliances / Disclosure practices; Shareholders Satisfaction Survey and Sustainable Development Initiatives & Ecological Sustainability. ■



NAFFCO; Synonym for Fire Safety equipment

One of the world's most respected businesses in fire protection engineering, NAFFCO offers a broad portfolio of superior quality firefighting equipment, fire protection systems, fire alarms, security, and safety engineering systems. Its top-of-the-line products include all types of firefighting systems, such as sprinklers, inert gas systems, CO2 and the complete line of powder systems. It also offers state-of-the-art fire trucks, rapid intervention vehicles, mobile hospitals (for refugees and emergency provisions), Airfield Crash Fire Tenders (ACFTs), and a variety of different types of ambulance.

Specified product manufactured in our facility has been certified by UL, FM,

BSI, LPCB & Global Mark in consistent with International Standards. The Quality Management System, ISO 9001 has been certified by BSI & UL-DQS. Environmental (ISO 14001) and Occupational Health & Safety (ISO 45001) Management Systems have been certified by UL-DQS. Trucks & Vehicles division has been assessed & certified for Quality Management System requirement for Aviation, Space & Defense organization (AS 9100) by UL-DQS.

The Leader

Khalid Al-Khatib, Chief Executive Officer of NAFFCO, is a visionary businessman who believes that protecting people from fire – and educating about fire safety – is much more than just a job. It is his life-long

commitment and from an early age, he knew that his passion lay in saving lives.

NAFFCO's success in the firefighting industry did not happen overnight. It was a gradual process of setting and achieving small realistic goals one at a time. From a team of 15 members when it started, NAFFCO today has more than 15,000 members including 2,000 passionate engineers and has over 6.5 million square feet of state-of-the-art manufacturing facilities.

The latest development

NAFFCO provide total solution for all fire, health and safety. For example, to fight against COVID-19, NAFFCO has developed a 100% natural disinfectant which is certified by Microbac Laboratory USA, Eurofins Laboratory Australia

to kill COVID-19 within 30 seconds and is safe for humans, fruits and vegetables and even new-born babies. This is a good 100% natural disinfectant. This liquid also comes as an automatic spray system which can be installed inside their Fire trucks, Mobile Hospitals and Ambulances.

Global growth

In addition to local offices and manufacturing plants in 15 countries worldwide including India, NAFFCO has just arrived in Australia, where we have around 150,000 square feet facility now. It's a market that is moving very well. We also have reached South America, Indonesia, Malaysia, Vietnam, Bangladesh and India United Kingdom. Wherever there is an opportunity to protect life, NAFFCO is there.





NAFFCO's Vision in India

NAFFCO is aligned with the vision of Indian government "MAKE IN INDIA" and a step towards the same, NAFFCO has started with their subsidiary NAFFCO INDIA PVT. LTD. In the year 2016 and having manufacturing plant in Chennai with sales, engineering and after sales and service office in Chennai,

Mumbai and Delhi.

A list of esteemed clients in India includes – DRDO, HAL, Airports Authority of India, Maharashtra Airport Development Corporation, L&T, Hyderabad Metro Rail, Shapoorji Paloonji, Lodha Group and many more. They are passionate to build fireproof modern India by bringing their experience,

new technologies and certified products in India. aggressively looking to take market share in India and to support the same very soon coming up with bigger manufacturing plants in India.

NAFFCO India is now 100-member strong team committed to spreading knowledge on the use of certified products.

NAFFCO is successfully executing some of the landmark projects in India by provide complete FDPS package to:

- 2x660MW – NTPC Khargone Super Critical Coal Fired power plant.
- Mumbai Metro and many more.

NAFFCO delivers 31 units ACFT vehicles to Indian Airports

NAFFCO has delivered and commissioned 31 units ACFT vehicles to Indian Airports. FALCON 6, Airfield Crash Fire Tenders (ACFTs) vehicles to 30 airports across India was delivered in 2019. Mass production was accomplished within 6 months and each vehicle has passed through a stringent quality and performance parameter test in accordance to NFPA 414

at our world-class in-house testing facility before delivery.

The arrival was celebrated with a traditional rollout ceremony and water salute at airports in conjunction with Airport Authority of India followed by a successful SITE ACCEPTANCE TEST, Commissioning and Training. With execution of one of the world's largest order of ACFTs NAFFCO is now among the top manufacturer of ACFTs vehicles globally.

This success was followed by supply of two ACFTs to Shirdi International Airport, one to HAL Nasik and recent order of ACFT from DRDO.

Thinking Smart

Looking to the future, NAFFCO is committed to developing Smart Solutions, keeping in mind the UAE's eagerness and policy to opt for Smart Cities. ■



Ketan Sethi

Export Manager and Vehicles Sales Head (India), NAFFCO



Collins Aerospace to provide Army with anti-jam technology



The highest anti-jamming and anti-spoofing PNT technology providing access and trusted data for success of critical missions Collins Aerospace Systems, a unit of Raytheon Technologies Corp. (NYSE: RTX), has been selected to

provide Mounted Assured Positioning, Navigation and Timing System (MAPS Gen II) for manned and unmanned ground vehicles to combat Positioning, Navigation and Timing (PNT) threats.

MAPS II provides a high-assurance, accurate navigation solution across GPS threat environments with industry-leading NavFusion of multiple sensors and is interoperable with the Collins Aerospace PRC-162 manpack radio to ensure mission success in the Joint All Domain Command and Control (JADC2) battlespace.

Its advanced anti-spoofing and anti-jamming technology addresses evolving enemy threats and technologies. The warfighter can navigate through high threat environments with the confidence of knowing where they

are, where they need to go, at the precise time with weapons on target.

Leveraging Collins Aerospace's NavHub™-100 navigation system and Multi-Sensor Antenna System (MSAS-100), this navigation capability distributes Assured Position, Navigation and Timing (APNT) information to all systems onboard the platform through one device. The MAPS Gen II system includes Military Code (M-Code) capability and improved levels of reliability through patented Modernized Signal Tracking (MST) that enhances GPS integrity. Additionally, the open architecture, modular, and scalable technology lets the Army add additional sensors and capability with a much lower life-cycle cost, such as alternative Radio Frequency (RF) and Line of Bearing (LOB). ■

UP's Bareilly Airport to connect with Lucknow & Delhi under RCS-UDAN



Airports Authority of India, in its continuous endeavor to link under-served and unserved airports through RCS routes, is developing the civil enclave at Bareilly for commencement of civil flight operations for Lucknow and Delhi under Regional Connectivity Scheme.

Bareilly is the eighth largest metropolis in Uttar Pradesh, and the 50th-largest city in India. Bareilly also figured amongst the PM Narendra Modi's ambitious 100 Smart City list in India. It is located on the Ramganga

River and is the site of the Ramganga Barrage built for canal irrigation.

Bareilly airport belongs to the Indian Air Force (IAF) and AAI has developed a New civil enclave with interim Terminal Building of area 525 sqm along with apron for parking of one ATR 72 type of Aircraft. The Interim Terminal Building will be utilized for commencement of RCS operations. Bareilly will be connected to Lucknow and Delhi under the UDAN scheme of central government. Flights from Bareilly to Delhi or Bareilly to Lucknow are

expected to start by December 2020.

Other major development works at Bareilly Airport that have been undertaken by AAI include construction of Pre-engineered regular Terminal building along with associated facilities, construction of apron and Taxi track for operation of two ATR 72 Type of Aircrafts. The total cost of these work is expected to be around Rs. 70 Crore. The Pre-Engineered regular Terminal Building, with an area of 2520 sqm, will be able to handle 150 passengers (75 Arrival and 75 Departure) during peak hours. Equipped with six check-in counters, the airport will also have car parking facility for 90 cars. More than 80% of the work is completed and soon airport will be ready for civil operations.

The city is a center for furniture manufacturing and trade in cotton, cereal and sugar. With the operationalization of Bareilly Airport, demand of business class of the region for air connectivity will be fulfilled. ■



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India's private firms to get much bigger space

Under the new Spacecom Policy-2020 drafted by the Department of Space, Government of India, private companies in the country can develop new systems related to space, launch satellites and sell services to foreign clients.



In a landmark move, India's Department of Space (DoS) has decided to allow private companies in the country to develop new systems, launch satellites and sell services to foreign customers under its Spacecom Policy-2020. "DoS and Indian Space Research Organisation (ISRO), in their efforts to achieve end-to-end capabilities, have nurtured Indian industry to be partners in supplies and services while realizing launch vehicles and satellites. In this endeavour, Indian industry has acquired skillset and capability to realize the sub-systems and satellite systems meeting the stringent specifications and reliability," says the draft policy.

Under the Spacecom Policy-2020, which will replace the existing Satcom Policy, Indian industries can also utilize the existing space assets for communication services. Henceforth,

private Indian companies can establish control centres outside the country and use overseas space assets. They can establish satellite systems through satellites built on their own or procured. In addition, telemetry, tracking & command (TT&C) earth stations and satellite control centres (SCC) can be established in or outside India. This capacity could be offered to commercial and societal communications within as well as outside the country. The systems and solutions developed by private firms can also be offered to international markets.

Indian orbital resources can be availed from designated PSU/CPSEs under DoS on commercial basis subject to availability. The authorized Indian entities can directly offer their capacities to customers.

"The demand for bandwidth is increasing substantially

from ongoing services as well as emerging applications. With the advancements in technology, space-based communications are becoming efficient and affordable. The non-government private entities can play a big role in addressing the growing demand within India and also use the opportunity to be important players in the international space communications market," elaborates the draft policy.

"It is an opportune time to enable commercial communication activities to be carried out by non-governmental Indian entities to not only meet Indian requirements but also enable them to become significant players in the global space communication arena. Government of India seeks a greater participation of Indian Industry to meet the demands in activities of realizing, owning, operating satellite systems for communications over India and outside, creating facilities for satellite control operations and so on," the draft policy adds.

According to K Sivan, Secretary, DoS, the new policy will have everything the Satcom Policy has in terms of protection of India's assets, creation of new assets, monitoring and operations. "The major changes are related to encouraging the private sector and renewing focus on enhancing national security capabilities," he said.

Sivan said that this was only the first step and that specific policies on launch vehicles, navigation, remote sensing, space exploration, human spaceflight and a national space policy would be released soon. He opined that these developments would propel India to the "next level."

Several representatives of Indian private industry welcomed the government decision. They said that it is a positive move and boosts investor confidence. Moreover, they expect a boom in small satellite launches.

As per the draft, satellite communication systems which cannot be developed in a totally commercial domain could be brought into operation with the involvement of the government for sustainability. For instance, Satcom programmes which focused on tribal development, social empowerment, health, education and disaster management will remain under DoS. "Such programmes exist to address specific objectives, and may not be commercially viable in nature," says the draft of the Spacecom Policy-2020.

At the same time, DoS has signed a crucial agreement with NewSpace India Ltd., (NSIL) a space PSU. As per the MoU, the PSU has been tasked with further encouraging the private sector. "NSIL will be able to transfer technologies to the private industry," it says. ■

Chief of Army Staff Commissions Anti-Submarine Warfare stealth corvette INS Kavaratti



INS Kavaratti (P31), Anti-Submarine Warfare (ASW) stealth corvette built under Project 28 (Kamorta Class) was commissioned into the Indian Navy by General Manoj Mukund Naravane PVSM, AVSM, SM, VSM, ADC, Chief of the Army Staff at Naval Dockyard, Visakhapatnam.

Vice Admiral Atul Kumar Jain PVSM AVSM VSM, Flag Officer Commanding-in-Chief (FOC-in-C), Eastern Naval Command(ENC), Rear Admiral Vipin Kumar Saxena (Retd), CMD, Garden Reach Shipbuilders & Engineers Limited, Kolkata (GRSE), Kolkata and other dignitaries were also present during the ceremony. The event marks the formal commissioning into the Navy of the last of the four ASW Corvettes, indigenously designed by the Indian Navy's in-house organisation, Directorate of Naval Design and constructed by GRSE

General Naravane was presented a guard of honour on arrival at the Naval Jetty. Rear Adm Saxena (Retd), CMD, GRSE Vice Adm Atul Kumar Jain FOC-in-C ENC addressed the gathering which was followed by reading out the Commissioning Warrant of the Ship by the Commanding Officer,



Amit Banerjee Appointed as Director (Rail & Metro Business), BEML



Amit Banerjee has assumed charge as Director (Rail & Metro Business) and Member on the Board of BEML Limited.

He is a graduate in Mechanical Engineering from IIT (BHU), Varanasi and joined BEML as Asst. Engineer in 1984. In his professional career spanning

over three decades in BEML, Banerjee has worked in R&D and manufacturing functions. His experience involves design & development of various products like SSEMU, Metro cars, Catenary Maintenance Vehicle etc.

His team received the Raksha Mantri award for Design Effort towards Design & Development of Austenitic Stainless Steel EMU & Intermediate metro cars for Delhi Metro. He has played a significant role in phased indigenization of Rolling Stock aggregates. Prior to assuming the present position, Amit Banerjee was Executive Director (Rail & Metro).

Mattias Radstrom appointed as new Press Officer at Saab



Defence and Security company Saab has appointed Mattias Radstrom as the new Press Officer. Mattias Radstrom has previously worked at Electrolux as VP Global Head of PR and Social Media and Head of PR and Communication Nordic, and at Cramo Group as SVP Communications, IR and Marketing. Most recently Mattias Radstrom has run his own consultancy in communications.

"Saab is a company at the forefront of technology, and I am excited to be part of the company's journey towards continued growth and international expansion. Clear and transparent communication

is an important foundation for the company to achieve its long-term goals and I look forward to joining the team and contribute with my experiences," Mattias Radstrom, Press Officer at Saab. As Press Officer, Mattias Radstrom will lead the team at Saab Press Center consisting of four Media Relation Managers in Stockholm and London. ■

Commander Sandeep Singh. Subsequently, hoisting of the Naval Ensign onboard for the first time and 'Breaking of the Commissioning Pennant' with the National Anthem being played marked the symbolic tradition of commissioning. The Army Chief later unveiled the Commissioning Plaque and dedicated the ship to the nation. He also addressed the gathering attending the commissioning ceremony.

Named after the capital of the Lakshadweep group of islands, INS Kavaratti has been constructed using high-grade DMR 249A steel produced in India. The sleek and magnificent ship spans 109 meters in length, 14 meters in breadth with a displacement of 3300 tonnes and can rightfully be regarded as one of the most potent Anti-Submarine Warships to have been constructed in India. The complete superstructure of the ship has been built

using composite material. The ship is propelled by four Diesel engines. The ship has enhanced stealth features resulting in reduced Radar Cross Section (RCS) achieved by X form of superstructure along with optimally sloped surfaces. The ship's advanced stealth features make her less susceptible to detection by the enemy.

The unique feature of this ship is the high level of indigenisation incorporated in the production, accentuating our National Objective of 'Atmanirbhar Bharat'. The ship has high indigenous content with the state of the art equipment & systems to fight in Nuclear, Biological and Chemical (NBC) warfare conditions. Also, the weapons and sensors suite onboard is pre-dominantly indigenous and showcases the Nation's evolving capability in this niche area. Some of the major equipment/ systems developed

indigenously include Combat Management System, Torpedo Tube Launchers and Infra-Red Signature Suppression System etc.

INS Kavaratti has a multitude of advanced automation systems such as Total Atmospheric Control System (TACS), Integrated Platform Management System (IPMS), Integrated Bridge System (IBS), Battle Damage Control System (BDCS) and Personnel Locator System (PLS) to provide a contemporary and process-oriented System of Systems for optimal functioning of the warship. Having completed sea trials of all her equipment, Kavaratti has been commissioned as a fully combat-ready platform providing a boost to the ASW capability of the Indian Navy.

The ship is the reincarnation of the erstwhile Arnala Class missile corvette of the

same name (INS Kavaratti – P 80). Kavaratti in her previous avatar has had a distinguished service and her legacy outlives her service life of almost two decades. Her illustrious past includes participation in the 1971 war for the liberation of Bangladesh and many other operational deployments. During the 1971 war, she was deployed for contraband control in the Bay of Bengal and the support of mining of entrances to Chittagong. She captured the Pakistani Merchant Ship Baqir during this operation. In the present avatar, Kavaratti is equally powerful and packs an even more deadly punch.

The ship is manned by a team comprising twelve officers and 134 sailors with Commander Sandeep Singh at the helm as her first Commanding Officer. The ship would be an integral part of the Eastern Fleet under the Eastern Naval Command. ■

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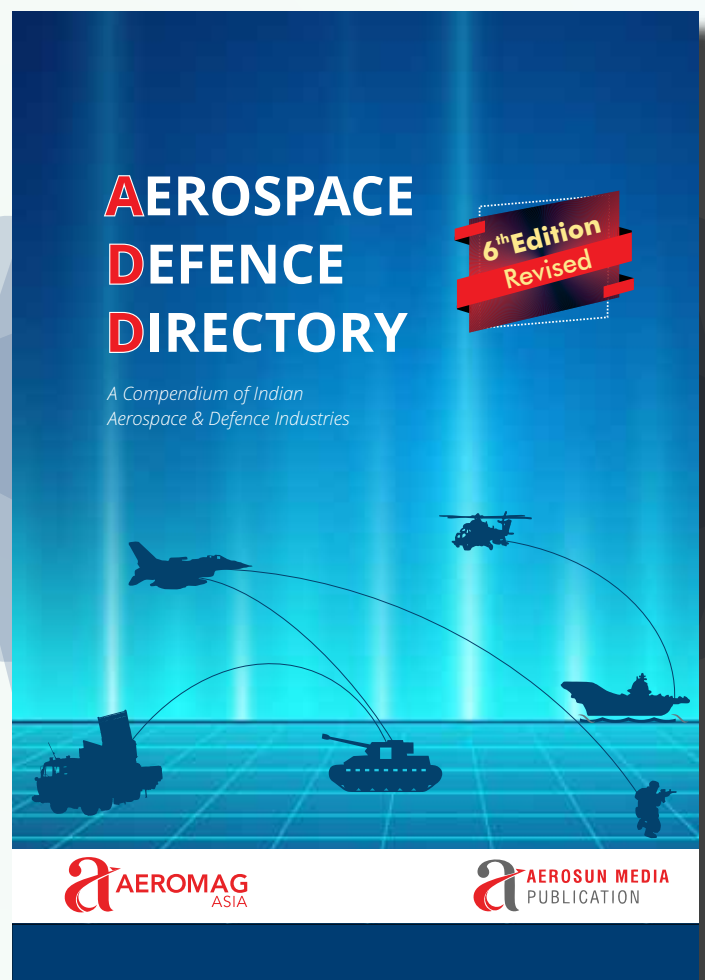
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TOR and Buk air defense systems tested against cruise missiles at less than 10m altitudes



2018 Russia announced the launching at the global market of TOR-E2 ADMS. As the Rosoboronexport Director General Alexander Mikheev pointed out at that time, it surpassed most of its foreign counterparts in terms of 'unique combat capabilities and technical characteristics'.

The air defense systems form a significant part of the overall Russian military export. As Mikheev pointed out earlier in Independent Military Review interview, the increase in the Rosoboronexport's portfolio's share of air defense weapons was due to such landmark contracts as those for the supply of S-400 Triumph long-range anti-aircraft missile system and other systems.

Rosoboronexport was established on 4th November 2000 by the Russian President Vladimir Putin. It is the Russian state intermediary for the exports and imports of the entire range of products, technologies, and services of military and dual use. Among the latest offerings in the air defense domain is a line of electronic countermeasure systems intended for the use against small-sized UAVs. These systems were officially presented by Rosoboronexport at Dubai Airshow in 2019 and later at DefExpo India in Lucknow.

Russian Army's TOR-M2 short-range and Buk-M3 medium-range air defense missile systems have intercepted during the drills the cruise missiles flying at altitudes less than 10 meters, reports officially the Russian Ministry of Defense.

The testing resulting in destroying of all the designated targets took place during the large-scale army air defense drills in the South of Russia.

"At the first stage of the exercise, the S-300V4 long-range anti-aircraft missile system battalions repelled the strike of aero ballistic missiles, carrying out combat launches at targets descending from an altitude of more than 200 km. At the second stage, combat crews of Buk-M3 medium-range air defense systems and Tor-M2 short-range anti-aircraft missile systems battalions, after

performing combat missile launches, repelled the attack of the simulated enemy cruise missiles flying at altitudes less than 10 meters. Buk-M3 hit targets at a distance of up to 40 km, while Tor-M2 divisions, in turn, performed combat launches at air targets at a distance of up to 15 km", - said the MoD.

All the systems used during the massive drills have their export modifications, that are actively promoted at the global market by Rosoboronexport, the state intermediary for military and dual-use exports and imports, that celebrates its 20th anniversary on November 4th this year. The systems were showcased at the ARMY 2020 Expo in Russia in August.

The export modification of S-300V4 ADMS called Antey-4000 was unveiled for the first time at ARMY Expo. Buk-M3 is marketed globally as the Viking. In



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Boeing, U.S. Navy to Demo Future Ramjet Missile Technology



The demonstrator will help the Navy determine technical requirements for future carrier-based weapons systems.

Boeing and the U.S. Navy will demonstrate advanced missile technologies that will make carrier air wing strike fighters more lethal against threats into the next decade.

Boeing has been awarded a \$30 million contract from the Navy to co-develop

the Supersonic Propulsion Enabled Advanced Ramjet (SPEAR) flight demonstrator with the Navy's Air Warfare Center Weapons Division. The contract award comes after the Department of Defense requested information from the defense industry to help the Navy determine technical requirements of future carrier-based land and sea strike weapons systems.

"The SPEAR flight demonstrator will provide the F/A-18 Super Hornet and carrier strike group with significant improvements in range and survivability against advanced threat defensive

systems," said Steve Mercer, Boeing's SPEAR program manager. "We have a talented team of engineers to meet the challenging technical demands and schedule timeline that the SPEAR program requires. We look forward to working with Navy experts to advance technologies for the Navy's future capabilities."

Boeing and the Navy Air Warfare Center Weapons Division plan to fly the SPEAR demonstrator in late 2022. Prior successes by Boeing in developing supersonic and hypersonic technologies include the X-51 Waverider test vehicle in 2010 and

the Variable Flow Ducted Rocket propulsion system under the Triple Target Terminator program in 2014.

Boeing is the world's largest aerospace company and leading provider of commercial airplanes, defense, space and security systems, and global services. As a top U.S. exporter, the company supports commercial and government customers in more than 150 countries. Building on a legacy of aerospace leadership, Boeing continues to lead in technology and innovation, deliver for its customers and invest in its people and future growth. ■

Nasmyth signs precision engineering contract with Incora™

Nasmyth Group has signed a multi-million pound contract with Incora to manufacture precision engineered components for multiple platforms including new and aftermarket OE (Original Engine) Build and support to Legacy Engines.

The seven-year contract will be carried out by the Nasmyth Bulwell team, from their state-of-the-art manufacturing facility in Pinxton, Nottinghamshire and Nasmyth Group's manufacturing team in Asia. For over 60 years, Nasmyth Bulwell has provided high quality, uniquely integrated precision engineering and manufacturing solutions for the global aerospace industry. Nasmyth Bulwell specialises

in the manufacture of solid machine solutions including precision parts, kits, airframe assemblies and sub-assemblies using the latest CAD/CAM technology to interface with customer design teams.

Excellence in engineering and cutting-edge up to 5-axis technology has positioned Nasmyth Bulwell at the forefront of precision machining, producing quality assured components in steel, aluminium, nimonics and super alloys.

Nasmyth Bulwell offers a unique engineering service to their global customers by utilising world-class manufacturing in the UK and its supply chain in Asia. Incora, formerly Wesco Aircraft and Pattonair, is a leading provider of innovative

supply chain management services to the global

aerospace and other industries. ■



Nasmyth Group signs multi-million pound precision engineering contract with Incora



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Energizing Indian Aircraft MRO Industry for Growth



Pulak Sen
Secretary General,
MRO Association of India

The Indian Commercial Aviation market is currently, pegged at US\$ 900 million. Added to this is around US\$ 500 million business in the General and Business aviation segment. On top of this, the defence business of Life Cycle or MRO of the four services is pegged at US\$ 2.6 billion.

The Novel Corona pandemic has had the greatest impact on the global economy in general and the aviation industry in particular. The global aviation industry is now limping back with some restrictions. Needless to say, that the global MRO industry has also taken a beating.

On March 24, 2020, the Government of India announced a nationwide lockdown for 21 days, limiting the movement of the people as a preventive measure against the COVID-19 pandemic, bringing the country to a standstill.

At the time of the lockdown the Indian Aircraft Registry had a total of 690 aircraft on its books of various airlines. Indigo fleet is the largest with 274 aircraft, a mix of A320 family and ATRs, followed by the Indian national carrier Air India with 155 aircraft consisting of Boeings, Airbus and ATRs,

followed by SpiceJet with 109 aircraft consisting of Boeing 737s and Q400s.

With the Government launching its Vande Bharat Mission to evacuate Indians and other nationals stuck in various destination all over the world, Air India initially played a vital role and other airlines followed suit.

After a two-month long shutdown, domestic flights were allowed to resume operations in a staggered manner starting May 25, 2020. The Government put restrictions on the load to be carried by the Indian carriers at 30 per cent of their capacity. Now this restriction has been increased to 50 per cent of their capacity. Initially, there were very few passengers traveling by air. This has somehow increased due to festive season.

The year 2020 saw a few silver linings for the Aviation Industry, including MRO. First good news came for the industry on April 1, 2020 with the announcement of reduction of GST from 18 per cent to 5 per cent. This was a tremendous boost to the Indian MRO industry, which was not functioning due to the Lockdown.

Then came the announcement of the Finance Minister Nirmala Sitharaman

on MRO. The minister said that the Government will take steps to make India an MRO hub. She went on to say, "Tax regime for MRO ecosystem has been rationalized. India has all the capacities, manpower and soft skills required. Aircraft component repairs and airframe maintenance segment is worth around Rs 800 crore and would increase to Rs 2,000 crore in three years. Convergence between Defence sector and the civil MROs will be established to create economies of scale. This will lead to maintenance cost of airlines to come down."

This has given a great boost to the Indian MRO Industry. Subsequent to the FM's statement, a joint working group has been formed under the Joint Chairmanship of V.L. Kantha Rao, Additional Secretary (DP), Ministry of Defence, Vadana Aggarwal, Senior Economic Advisor, Ministry of Civil Aviation with six other members in order to establish convergence between Defence sector MRO and civil Aviation MRO operations. This group is working currently and will give its recommendations to the Government soon.

For a very long time, MRO Association of India and other bodies such as SIATI have

requested the Government to consider extension of the Offset clause in Military purchases to be extended to the civil sector too. Indian commercial airlines have placed orders with OEMs such as Airbus and Boeing for several aircraft worth billions of dollars. Both Indigo and SpiceJet combined orders for Airbus and Boeing aircraft worth US\$ 55 billion. Similarly, engine orders for these aircraft to CFM International for both airlines worth US\$ 32.5 billion. If the Government exercises the 30 per cent Offset clause on these orders, the three companies would have to spend US\$ 64.75 billion worth in investments in India.

With the lack of a Civil Offset policy, the country has lost several billion dollars in offset obligations. With the Prime Minister's clarion call of Aatma Nirbhar Bharat – Self-reliant India, the provision of Civil Offset will enhance the Indian Civil Aviation industry and will be instrumental in attracting foreign investments in the country as well as give employment to large number of youths. This way it will enable the Indian Civil Aviation to be robust in the near future.

Leasing of Aircraft, Aero engines and Financing of aviation component has traditionally been very expensive as these are done from foreign lands. With active participation by Ministry of Civil Aviation and the industry stakeholders, on October 16, 2020, the Ministry of Finance, Department of Economic Affairs in an Extraordinary Notice sub-section (1)

of section 3 of the International Financial Services Centers Authority Act, 2019 (50 of 2019), the Government has notified that aircraft lease which shall include operating and financial lease and any hybrid of operating and financial lease of aircraft or helicopter and engines of aircraft or helicopter or any other part thereof, as financial product. This is a huge boost to the Indian aviation industry.

Indian companies which will enter into this field of lease-financing are opening up their offices in the GIFT City located in Gandhi Nagar Gujarat. Changes to the tax regulations introduced by the Government will provide special incentive for foreign funds who choose to shift their base from Singapore or Mauritius to International Financial Services Centre (IFSC), Gift City.

The demand for carrying tones of medical supply by air around the world has given a new direction to the global airlines, including those in India. Airlines in India have risen up to this demand of cargo volumes and have requisitioned the services of Indian MRO to temporarily converting their aircraft from passenger to cargo/freighters. This has opened up a new scope of work by Indian MROs and thereby creation of a revenue stream.

SpiceJet Technic, the engineering arm of SpiceJet, has taken on lease six Q400s and converted them to an all-cargo version for this new task. They have also converted five Boeing 737s. The airline recently announced it will soon induct

its first Airbus A340 cargo aircraft in its freighters fleet. The induction of the first wide-body freighter will help the airline to primarily operate cargo flights on long-haul routes including destinations in Europe, CIS and African region.

"The induction of our first wide-body cargo aircraft will be a huge game changer in our journey as the country's largest cargo operator," SpiceJet Chairman and Managing Director Ajay Singh said.

According to Indigo Chief Executive Officer Rono Dutta, the airline operated some international cargo flights early on during the lockdown period and the segment emerged as a "bright spot" for airline. The airline has converted ten aircraft in its fleet.

"We are looking at cargo even when we come back to full operations, should we do some all-cargo operations to international destinations because there are some channels that we have discovered and these are some strong niche markets. So, I expect cargo operations to do well in the future," Dutta said. The airline is reported to be in talks with Airbus to get dedicated freighters and create a cargo division in the airline.

According to study done by the MRO association, the global pandemic has thrown open new avenues for business opportunities to the Indian MRO Industry and the third-party MROs in India have their hangars full with work, especially on lease return aircraft. ■

IAI Unveils New Passive Coherent Location System (PCL)

ELTAs Systems, IAI's Group and subsidiary unveils its new Passive Coherent Location System (PCL). The system enables the creation of an air situation picture that tracks non-emitting targets using non-cooperative transmitters. It detects and tracks aerial threats based on target reflection from non-cooperative transmissions from FM or Digital Audio Broadcasting (DAB) towers. The reflections are received by one or a network of antennas, providing 3D real-time omnidirectional coverage for tracking of multiple targets in congested airborne traffic.

The PCL system is simple to deploy and can be located on remote borders, as well as in urban areas. Installation can include one sensor or a cluster of sensors for redundancy

and improved coverage of specific problematic areas. The sites are connected to the central PCL command and control processing unit via a dedicated data link.

The new system is already deployable and provides real-time aerial mapping, of non-emitting threats.

VP AND General Manager of IAI/ELTA's Intelligence, Communications and EW division, Adi Dulberg, said, "We are proud to introduce the new PCL system developed by IAI/ELTA, that detects and classifies aerial risks without unveiling the locator. The PCL system creates air situation picture and can be deployed independently or as an additional layer for air control radars, as part of a multi-disciplinary air situation picture". ■



Defence Minister releases DRDO's new Procurement Manual



Rajnath Singh
Defence Minister,

To encourage Indian industry, including Start-ups and MSMEs in Defence Research & Development to achieve 'Atmanirbhar Bharat', Defence Minister Rajnath Singh released the new version of Defence Research and Development Organisation Procurement Manual 2020 (PM-2020). The PM-2020, will facilitate

faster execution of R&D projects and programmes. The modified features in the manual will go a long way to facilitate participation of industry in various R&D projects.

Bid security declaration option for earnest money deposit, increase of threshold limit for advance payment, placement of order on lowest bidder 2 (L2) in case L1 backs out are some of the salient features of the new manual, which will assist the industry for the speedy execution of projects.

Exemption of bid security and performance security up to Rs 10 lakh, no negotiations for commercial off-the-shelf (COTS) items/services wherever price discovery is happening through market forces are other features.

Performance security for service contracts is linked

to the payment cycle instead of total contract value. Procurement of stores from development partners, safeguarding of free issue material through insurance cover instead of bank guarantee (BG) are other facilitating measures adopted to help the industry.

In the new PM-2020, the liquidated damage (LD) rate for development contracts has been reduced. The delivery period (DP) extension process has been simplified for faster decision making. Many of the internal procedures have been further simplified for faster engagement with industry. The previous Procurement Manual of DRDO was last modified in 2016.

Speaking on the occasion, Rajnath Singh said, "The new DRDO Procurement Manual will facilitate the indigenous Defence



Industry by simplifying the processes and ensure their participation in design and development activities. The PM-2020 will help towards realising Prime Minister Narendra Modi's dream of 'Atmanirbhar Bharat'."

Secretary Department of Defence Research & Development and Chairman DRDO Dr G Satheesh Reddy, Secretary (Defence Finance) Smt Gargi Kaul and other senior officials of Ministry of Defence participated in the event. ■

Final user trial of NAG Missile of DRDO successful

Final user trial of the 3rd generation Anti-Tank Guided Missile (ATGM) NAG was carried out from Pokhran range. The missile was integrated with the actual warhead and a tank target was kept at designated range. This was launched from NAG Missile Carrier NAMICA. The missile hit the target accurately defeating the armour.

ATGM NAG has been developed by DRDO to engage highly fortified enemy tanks in day and

night conditions. The missile has "Fire & Forget" "Top Attack" capabilities with passive homing guidance to defeat all MBTs equipped with composite and reactive armour.

The NAG missile carrier NAMICA is a BMP II based system with amphibious capability. With this final user trial, NAG will enter production phase. The missile will be produced by Defence PSU Bharat Dynamics Limited (BDL), whereas

Ordnance Factory Medak will produce the NAMICA.

Defence Minister Rajnath Singh congratulated DRDO and Indian Army for the successful trial of NAG Missile.

Secretary DDR&D & Chairman DRDO, Dr G Satheesh Reddy appreciated the efforts of DRDO, Indian Army and Industry in bringing the missile up to the production phase. ■



Prime Minister inaugurates Sea-plane Service in Ahmedabad



Prime Minister, Narendra Modi inaugurates the Water Aerodrome and Sea Plane Service, on the occasion of the Rashtriya Ekta Diwas, in Kevadia, in Gujarat on October 31, 2020. The Governor of Gujarat, Acharya Devvrat, Chief Minister of Gujarat, Vijay Rupani, the Minister of State for Shipping (Independent Charge) and Chemicals & Fertilizers, Mansukh L. Mandaviya are also seen.



The Prime Minister Narendra Modi inaugurated Water Aerodrome at Kevadia and the Sea-plane Service connecting Statue of Unity in Kevadia with Sabarmati Riverfront in Ahmedabad, Gujarat.

Modi also inaugurated Water

Aerodrome in Sabarmati Riverfront in Ahmedabad and the Sea Plane Service from Sabarmati Riverfront to Kevadia. These are part of a series of Water Aerodromes being planned to bring the last mile connectivity.

Seaplanes can land and

take-off from water thus offering access to areas that do not have landing strips or runways. Thus, it can help in connecting the geographies/regions that have challenges owing to its topography and bring the remotest parts of India into the mainstream

aviation network without the high cost of building airports and runways. These smaller fixed wing airplanes can land on water bodies like lakes, backwaters and dams, gravel, and grass, thus offering easy access to numerous tourist spots as well. ■

Liebherr-Aerospace to Develop Thermal Management Capabilities for Satellites

Gaining a partnership with European space manufacturer Thales Alenia Space and Centre National d'Etudes Spatiales (CNES), Liebherr-Aerospace, who has been active in the aviation industry for decades, is developing thermal management capabilities for a Mechanically Pumped Loop (MPL) cooling system for satellites.

Liebherr-Aerospace Toulouse SAS, based in Toulouse

(France), together with Thales Alenia Space, Joint Venture between Thales (67 %) and Leonardo (33 %) and CNES, is developing industrial production and co-design capabilities for evaporators and condensers. These are key components of the next-generation telecommunication satellite's technology payload and platform cooling system, which actively manages the electronic heat dissipation.

Manufacturing evaporators and condensers for future

MPL cooling systems will be a demanding assignment: As part of an innovative MPL, they will be in space for at least 15 years without maintenance. This means that the evaporators and condensers have to be completely free from leakage as well as extremely reliable and robust to operate flawlessly during this period at high heat-exchange performances. The telecommunication satellites fast-moving market is more

and more demanding in terms of responsiveness, high quality control and cost competitiveness. To be able to produce evaporators and condensers reaching new standards, Liebherr-Aerospace's French-based center of excellence is developing industrial welding and manufacturing processes, which are both innovative and highly repeatable for both space and serial production levels of requirements. ■

MALABAR-20 Naval Exercise

Phase 1 from 3-6 November



The 24th edition of the MALABAR naval exercise is scheduled in two phases in November 2020. Phase 1 of the Exercise MALABAR 20 involving participation by Indian Navy (IN), United States Navy (USN), Japan Maritime Self Defence Force (JMSDF), and Royal Australian Navy (RAN) is set to commence off Visakhapatnam in Bay of Bengal from 03 to 06 November 2020.

MALABAR series of maritime exercises commenced in 1992 as a bilateral IN-USN exercise. JMSDF joined

MALABAR in 2015. The 2020 edition will now witness participation of the RAN in this joint maritime exercise.

Phase-1 of MALABAR 20 will witness participation of Indian Navy units with United States Ship (USS) John S McCain (Guided-missile destroyer), Her Majesty's Australian Ship (HMAS) Ballarat (long range frigates) with integral MH-60 helicopter, and Japan Maritime Self Defence Ship (JMSDF) Onami (Destroyer) with integral SH-60 helicopter.

The Indian Navy participation in Phase 1 will be led by Rear Admiral Sanjay Vatsayan,

Flag Officer Commanding Eastern Fleet. Indian Navy units participating in the exercise include destroyer Ranvijay, frigate Shivalik, Off Shore Patrol Vessel Sukanya, Fleet Support Ship Shakti and submarine Sindhuraj. In addition, Advanced Jet Trainer Hawk, long-range maritime patrol aircraft P-8I, Dornier maritime patrol aircraft, and helicopters will also be participating in the exercise.

The exercise, being conducted as a 'non-contact, at sea only' exercise in view of COVID-19 pandemic, will showcase the high-levels of

synergy and coordination between the friendly navies, which is based on their shared values and commitment to an open, inclusive Indo-Pacific and a rules-based international order. MALABAR 20 Phase1 would witness complex and advanced naval exercises including surface, anti-submarine and anti-air warfare operations, cross deck flying, seamanship evolutions and weapon firing exercises.

Phase 2 of MALABAR 20 is scheduled to be conducted in the Arabian Sea in mid-November 2020. ■





**Special issue of Aeromag Asia for the
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**Special issue of
Arabian Defence**



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Rosoboronexport: 20 years on global arms market



Rosoboronexport (part of the Rostec State Corporation), the sole agency for the sale of Russian arms in the world market celebrates its 20th anniversary on November 4, 2020. The company was established by decree of the President of the Russian Federation as part of the reform of the country's military-technical cooperation system.

Before 2000, deliveries of Russian arms to the world market were made by Rosvooruzhenie and Promexport as well as by a number of manufacturers. Rosoboronexport was set up as the basis of effective vertical executive power in the field of military-technical cooperation. The company received the right to export the entire range of military products.

"Rosoboronexport has become a leader in the international arms market over the past two decades and achieved strong results in promoting products

manufactured by domestic enterprises, including those affiliated to Rostec. Its key financial indicators – the order book and the value of deliveries – have increased fivefold since 2000. Over the years, Rosoboronexport has signed more than 26,000 contracts with partners and delivered over \$180 billion worth of products to 122 countries around the world. A high level of competence, attention to trends and customer needs, demonstrated over the years, clearly suggest that the company has good prospects for expanding its footprint and deepening cooperation with partners," said Sergey Chemezov, CEO of Rostec and Chairman of the Board of Directors of Rosoboronexport.

Russia has consistently ranked second among the world's exporters of arms and military equipment. In two decades, foreign customers have

been supplied with products for all services of the armed forces.

"Our foreign partners have received products worth over \$85 billion for their Air Force. Exports of equipment for Air Defense and Ground Forces exceeded \$30 billion for each of these services of the armed forces and \$28 billion for the Navy," said Alexander Mikheev, Director General of Rosoboronexport and Deputy Chairman of the Russian Engineering Union.

A key challenge facing Rosoboronexport is to bring the latest high-tech weapons and military equipment to the global arms market.

It can be expected that Rosoboronexport will launch about 50 new modern weapons and pieces of military equipment on the global arms market in the next five to seven years. Potential "bestsellers" include products developed and manufactured by Rostec subsidiaries: Armata-based armored vehicles assembled at UralVagonZavod (UVZ), Su-57E fifth-generation fighter jet from UAC, Ka-52K ship-based helicopter, and the upgraded Mi-28NE from Russian Helicopters. Among the products of other companies, the Antey-4000 air defense missile system from the Almaz-Antey Air and Space Corporation cannot be ignored.

In addition to the export of final products for the armed forces, Rosoboronexport has successfully extended its foreign trade competencies to the construction of infrastructure facilities, provision of space services, and training of foreign specialists in the operation of Russian products.

Foreign customers appreciate Rosoboronexport competencies and the opportunity to cooperate with Russia's defense industry through the company as a unique one-stop shop offering a full package of services for the export of high-tech military and civilian products and technology transfer.

Rosoboronexport pays special attention to industrial partnership projects with foreign customers. The company has a large portfolio of fulfilled projects





eSymposium on

LEVERAGING LEASING FOR FORCE LEVEL MAINTENANCE & MODERNISATION

November 18, 2020; 1430 – 1830 Hrs

Why Leasing?

Leasing offers many advantages for cost constrained and limited duration stop gap requirements by way of Faster induction, Enables concentration on core competence, Removes technological complexity and lowers manpower costs for operations, maintenance and training and Lowers cost and time of acquisition and yet meets immediate operational objectives. It is the Vendor's responsibility to ensure the requisite force levels and guarantee Service delivery on a pay by use model. From a structuring perspective there is flexibility in availing one of several types of lease, wet, dry, financial or operational lease.

Lease of Military Assets

Lease of military assets for force modernisation and force level maintenance, to meet urgent operational requirements or for stop gap periods pending acquisition of the selected platform has been a practice followed by several militaries in the last decade. These include several navies who have leased OPVs, Fleet Tankers, Yard craft etc. Air Forces have also benefitted from Leasing. The Royal Air Force leased P-8s, the Philippines leased the TC90 from Japan, Italian Air Force leased 34 F-16s Fighters from the USAF to fill a gap during the transition from the F-104 and the Eurofighter. Norway and Denmark are using long term wet leased aircraft for Maritime Patrol and oil pollution detection at sea.

Potential Opportunities

The new Defence Acquisition Procedure 2020 has for the first time introduced Lease as a category for defence acquisitions and is a path breaking procedural change that facilitates a seamless transition from one capability to another through the intermediate mechanism of leasing. There are several platforms, systems and equipment that lend itself to Lease. These include:-

- Yardcraft, tugs and barges, Minesweepers & Fleet Support Ships.
- Fixed and Rotary wing aircraft for maritime surveillance, cargo and transport operations.
- Air to Air Refuellers.
- Light Utility Helicopters.
- Certain types of UAVs.
- Vehicles such as water bowsers and fuel tankers, mobile generators, tippers, earth moving equipment, material handling equipment, Tank Transporters etc.
- Various types of static air surveillance radars, perimeter surveillance systems and 'secure' communication equipment.
- Space based assets.

Chief Guest
Vice Admiral G Ashok Kumar
PVSM, AVSM, VSM
Vice Chief of Naval Staff
Indian Navy



eSymposium

To discuss the business opportunities for lease as a tool for force modernisation and force level maintenance, FICCI in collaboration with its knowledge partner SAMDeS will organise India's First eSymposium on Leveraging Leasing for Force Level Maintenance & Modernisation on November 18, 2020 from 1430 – 1830 Hrs

Who should Attend?

- Service and Civilian officers from the Government
- Foreign OEMs
- Indian platform and Equipment manufacturers
- Governments of Friendly Foreign Companies holding excess defence articles
- Defence Attaches
- Entrepreneurs
- Investors
- High Value Insurers and Financiers
- Academics

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ROSOBORONEXPORT

for licensed production and joint ventures in India, Jordan, Malaysia, Vietnam and several other countries.

"Today the world's economies require localization and are interested in technology transfer and job creation. Therefore, Southeast Asian and North African countries, India, and China have already established their own industrial platforms. Rosoboronexport is ready to work on them and, together with industry and Rostec State Corporation, promote Russian high-tech solutions, develop new products jointly with partners," said Alexander Mikheev.

The promotion of dual-use and civilian products to foreign markets has become a new and promising area of Rosoboronexport's activities. The company has extensive experience in integrated supplies of utility, fire and other specialized equipment. Today, the state special exporter also delivers non-military and service weapons and is active in the markets of high-tech security equipment, medical equipment, hospitals, and special equipment for public and private structures.

"The President has challenged the defense industry to diversify into

manufacturing competitive civilian products. In order to promote them to the world market, Rosoboronexport has set up a special business unit that will deal only with non-military products and assist companies that have no experience in independent foreign trade activities. This is a new direction that the company is implementing together with enterprises both inside and outside the defense-industrial complex. Here we see our responsibility to develop the economy of Russian regions and industry in general," Alexander Mikheev added.

India & UAE to increase defence co-operation in production and trade



In order to boost defence exports, a webinar between India and UAE was held on the theme of "Indian Defence Industry Global Outreach for Collaborative Partnership. Webinar and Expo India – UAE Defence Cooperation" was organized under the aegis of Department of Defence Production, Ministry of Defence, MoD, through the Society of Indian Defence Manufacturers, SIDM.

Ambassadors and senior MoD officials from both sides participated in the webinar and spoke about deep-rooted

relations between the two countries. Both sides agreed to take up cooperation in defence further through joint production and mutual trade which could be a win – win proposition for both the countries. Sanjay Jaju, JS (DIP) said that as part of the Atma Nirbhar Bharat Abhiyaan, we are not advocating protectionism. "On the contrary we are emphasizing on openness and inter-linkages so that our companies could become a part of the global supply chains and foreign companies could have a role in Indian

defence manufacturing ecosystem."

The webinar was part of the series of webinars which are being organized with friendly foreign countries in order to boost defence exports and to achieve defence export target of \$5 Billion in the next five years.

Various Indian companies such as L&T Defence, GRSE, OFB, MKU, Bharat Forge and Ashok Leyland made presentations on major platforms / equipment like Artillery Systems, Radars, Protected Vehicles, Coastal Surveillance System, Akash Missile system and Ammunition etc. in the webinar. From the UAE side STREIT Group, Rockford Xellerie, EDGE, TAWAZUN and Marakeb Technologies made presentations.

The webinar was attended by more than 180 participants and more than 100 virtual exhibition stalls were set up in the Expo.



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

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